

**INITIAL REVIEW
for an
ADDENDUM
to the
PUBLIC REVIEW DRAFT**

ENVIRONMENTAL ASSESSMENT / REGULATORY IMPACT REVIEW /
INITIAL REGULATORY FLEXIBILITY ANALYSIS

For a proposed Amendment to the
Fishery Management Plan for Groundfish of the Gulf of Alaska

**Chinook Salmon Prohibited Species
Catch in the Gulf of Alaska
Non-Pollock Trawl Fisheries**

September 13, 2013

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List of Acronyms and Abbreviations

'	feet
AAC	Alaska Administrative Code
ABC	acceptable biological catch
ADF&G	Alaska Department of Fish and Game
AEQ	adult equivalent
AFA	American Fisheries Act
AFSC	Alaska Fisheries Science Center
AGDB	Alaska Groundfish Data Bank
AKFIN	Alaska Fisheries Information Network
ANILCA	Alaska National Interest Lands Conservation Act
BASIS	Bering Sea-Aleutian Salmon International Survey
BEG	biological escapement goal
BOF	Board of Fish
BSAI	Bering Sea and Aleutian Islands
CAS	Catch Accounting System
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
COAR	Commercial Operators Annual Report
Council	North Pacific Fishery Management Council
CP	catcher/processor
CV	catcher vessel
CWT	coded-wire tag
DPS	distinct population segment
E	East
E.O.	Executive Order
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	essential fish habitat
EIS	Environmental Impact Statement
ESA	Endangered Species Act
ESU	endangered species unit
FMA	Fisheries Monitoring and Analysis
FMP	fishery management plan
FONSI	Finding of No Significant Impact
FR	<i>Federal Register</i>
FRFA	Final Regulatory Flexibility Analysis
ft	foot or feet
GHL	guideline harvest level
GOA	Gulf of Alaska
ID	Identification
IRFA	Initial Regulatory Flexibility Analysis
IPA	Incentive Plan Agreement
IQF	individually quick frozen
JAM	jeopardy or adverse modification
lb(s)	pound(s)
LEI	long-term effect index
LLP	license limitation program
LOA	length overall
m	meter or meters
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act

MMPA	Marine Mammal Protection Act
MSST	minimum stock size threshold
mt	metric ton
NAO	NOAA Administrative Order
NEPA	National Environmental Policy Act
NMFS	National Marine Fishery Service
NOAA	National Oceanographic and Atmospheric Administration
NPAFC	North Pacific Anadromous Fish Commission
NPFMC	North Pacific Fishery Management Council
NPPSD	North Pacific Pelagic Seabird Database
Observer Program	North Pacific Groundfish Observer Program
OEG	optimal escapement goal
OMB	Office of Management and Budget
PBR	potential biological removal
PSC	prohibited species catch
PRA	Paperwork Reduction Act
PSEIS	Programmatic Supplemental Environmental Impact Statement
PWS	Prince William Sound
RFA	Regulatory Flexibility Act
RFFA	reasonably foreseeable future action
RIR	Regulatory Impact Review
RP	Central GOA Rockfish Program
RP CV	Rockfish Program Catcher Vessel
RPA	reasonable and prudent alternative
RSW	refrigerated seawater
SAFE	Stock Assessment and Fishery Evaluation
SAR	stock assessment report
SBA	Small Business Act
Secretary	Secretary of Commerce
SEG	sustainable escapement goal
SET	sustainable escapement threshold
SNP	single nucleotide polymorphism
SPLASH	Structure of Populations, Levels of Abundance, and Status of Humpbacks
SRKW	Southern Resident killer whales
SSFP	Sustainable Salmon Fisheries Policy
SW	southwest
TAC	total allowable catch
U.S.	United States
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service
VMS	vessel monitoring system
W	West
WED	week-ending date

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Executive Summary

This document analyzes proposed management measures that could be incorporated into the Council's preferred alternative (PA) for managing Chinook salmon prohibited species catch (PSC) in the Western and Central Gulf of Alaska (GOA), as selected during the June 2013 meeting. The Council will consider the alternatives analyzed in this document, and any measure selected would become part of the proposed rule to be developed from the existing PA.

Purpose and need

The Council noted that there may be a net benefit in allowing unused Chinook salmon PSC to rollover from the catcher vessel (CV) sector apportionment for the Rockfish Program to support non-Rockfish Program CV fishing activity in the fall. The Council noted that the number of Chinook salmon PSC apportioned to the Rockfish Program CV sector in the PA (1,200 fish) is greater than the sector's historical average PSC use, and that this amount had been proposed with some sort of within-year rollover in mind. An effectively large PSC allowance may alter the incentive for the Rockfish Program CV sector to minimize Chinook salmon bycatch. The alternatives analyzed in this document reflect the Council's desire to ensure that the additional flexibility provided by a within-year PSC rollover provision would not reduce the Chinook avoidance incentives designed into the uncertainty pool mechanism, which is part of the existing PA. The alternatives also aim to form a rollover provision in a manner that will not allow the portion of unused PSC that qualified the Rockfish Program CV sector for the following year's uncertainty pool to be taken later in the same year by the non-Rockfish Program CV sector.

Description of the Alternatives

The following alternatives propose management measures that would apply exclusively to the catcher vessel sector in the directed non-pollock trawl fisheries in the Western and Central Gulf of Alaska.

Alternative 1: No action.

Alternative 2: The addition of the rollover provision as described in the EA/RIR to the Rockfish Program CV Chinook PSC cap and uncertainty pool.

Alternative 3: The addition of a provision allowing the rollover of all but 160 Chinook PSC and a Rockfish Program CV uncertainty pool.
[Staff note: Council clarified that such a rollover would occur on October 1]

Alternative 4: Rollover all Chinook PSC remaining in the Rockfish Program CV Chinook PSC cap when all Rockfish cooperatives have checked-out of the fishery but no later than November 15, and no uncertainty pool.
[Staff note: Council clarified that "no uncertainty pool" would only apply to the Rockfish Program CV sector]

For the purpose of this follow-on action, the analyst considers the status quo to be the Council's preferred alternative for a GOA non-pollock trawl Chinook salmon PSC limit, described in the motion approved by the Council in June 2013. Selecting the no action alternative would result in a final recommendation on Chinook salmon PSC limits consisting of the elements in the existing preferred alternative.

Alternative 1

The three sectors defined in the Council's PA are the GOA catcher/processors (CP), catcher vessels that are declared fishing under the Rockfish Program (RP CV), and catcher vessels that are not fishing under the Rockfish Program (non-RP CV). Based on historic average Chinook salmon bycatch, the PA

apportions the combined annual hard cap between the CP and CV sectors, and further subdivides the CV sector apportionment between RP trips and all other CV fishing activity. Of the 3,900 Chinook salmon PSC apportioned to the CV sector, 1,200 are set aside for trips by vessels fishing in the Rockfish CV sector. This apportionment to the RP CV sector is not further allocated among the specific cooperatives. Reaching the limit would close all CV fishing under the Rockfish Program for the year. Unused Chinook PSC would not become available to support non-RP CV fishing in any case. The difference between the Chinook taken in the RP CV sector and the limit of 1,200 fish would be, in essence, retired at the point when either (1) all RP CV cooperatives have checked-out of the Program for the year, or (2) after November 15, whichever comes first. All other CV activity in the non-pollock trawl fisheries, from January 20 through December 31, would be limited by a Chinook PSC hard cap of 2,700 fish.

The Council’s preferred alternative includes a provision to incentivize taking fewer Chinook PSC than the amount set by the limit, while also providing sectors that perform well with a moderate amount of flexibility around their PSC apportionment in the case of a subsequent year with high PSC encounter. Termed the “uncertainty pool” in the PA, this mechanism allows any sector that records less than its proportional share of a 6,500 Chinook salmon total hard cap in one year to access up to its proportional share of 1,000 *additional* Chinook in the following year, if that sector surpasses its base apportioned PSC limit. This provision could be thought of as an insurance policy that must be earned in every year.

Table ES-1 shows the apportionment of the total Chinook PSC limit to each of the three sectors defined in the preferred alternative. A sector’s performance in relation to the uncertainty pool threshold does not affect, nor is it affected by, the performance of other sectors. If a sector performs within its uncertainty pool threshold in a year (Year 1), and continues to do so in subsequent years (Year 2), the sector’s effective maximum allowable amount of PSC will never exceed its base PSC limit plus its uncertainty pool buffer. A sector that earns an uncertainty buffer for Year 2 is held to the same performance standard (threshold) that it faced in Year 1 in order to maintain the benefit of the uncertainty buffer in the following year (Year 3). These limits guarantee that the incentive to avoid Chinook salmon does not decrease over time, even if performance has been good.

Table ES-1 Chinook salmon PSC Limit apportionment, uncertainty pool performance thresholds and buffer sizes

		Rockfish Program Catcher Vessels	Non-Rockfish Program Catcher Vessels	Catcher/Processors
<i>Apportionment Share</i>		16%	36%	48%
Base PSC Limit	7,500	1,200	2,700	3,600
Uncertainty Pool Threshold	6,500	1,040	2,340	3,120
Uncertainty Pool Buffer	1,000	160	360	480

Alternative 2

Alternative 2 would incorporate the CV aspect of the rollover provision, as described in the EA/RIR presented to the Council in June 2013, into the Council’s PA. Chinook salmon PSC that was not utilized in the Rockfish Program CV sector – less a defined amount of PSC to be “held back” – would be rolled over to the non-RP CV sector on October 1. The amount of the rollover would be effectively determined by Chinook PSC usage in the RP CV sector up to that date. If Alternative 2 were selected, the Council would need to choose one of three potential amounts of the unused Rockfish Program CV Chinook salmon PSC to roll over for use in the fall non-Rockfish Program non-pollock CV trawl fisheries:

- Option 1: All but **104** of the remaining Rockfish Program CV Chinook salmon PSC;
- Option 2: All but **156** of the remaining Rockfish Program CV Chinook salmon PSC;
- Option 3: All but **208** of the remaining Rockfish Program CV Chinook salmon PSC.

Any Chinook salmon taken in the Rockfish Program CV sector between October 1 and November 15 would be debited from the amount of PSC that is not rolled into the non-Rockfish Program fall fisheries – i.e., the pool of between 104 and 208 Chinook salmon.

Alternative 3

Alternative 3 is functionally similar to Alternative 2 in that it would, on October 1, allow a portion of unused Chinook PSC from the Rockfish Program CV sector to be rolled over for use in the fall non-Rockfish Program CV fisheries. As above, selecting Alternative 3 would not alter the design of the uncertainty pool mechanism. Alternative 3 would allow the rollover of all but **160** of the remaining Chinook PSC apportioned to the Rockfish Program CV sector. As with Alternative 2, staff assumes that any Chinook PSC occurring in the Rockfish Program CV sector between October 1 and November 15 would be debited against the pool of 160 Chinook salmon that remains with the sector.

Alternative 4

Alternative 4 would allow all Chinook salmon PSC that was not utilized by the Rockfish Program CV sector to be rolled over for use by CVs that are not operating under the Rockfish Program. This rollover would take place once all RP CV cooperatives have been officially “checked out” of the Program by their respective cooperative manager, or on November 15 – whichever occurs first. Alternative 4 would also remove the Rockfish Program CV sector from the uncertainty pool mechanism. This is necessary because using *all* of the Chinook PSC rolled over from the RP CV sector to the fall non-Rockfish fishery would include catching the 160 Chinook salmon that the RP CV sector avoided in order to earn its share of the uncertainty buffer.

Environmental Assessment

The proposed action includes a no action alternative and three alternatives that would constitute a minor change to the Council’s existing preferred alternative. None of the alternatives considered in this report would allow annual Chinook salmon PSC to exceed the levels that were examined in the EA that was presented in June 2013. By extension, the proposed action will have no effect on the human environment, as defined in NAO 216-6, beyond those examined in the existing EA (NPFMC 2013, Section 3).

As described in the EA that informed the Council’s selection of a preferred alternative, the proposed action affects vessels – specifically catcher vessels, here – fishing in the federal non-pollock groundfish trawl fisheries in the Central and Western GOA, and may also affect vessels fishing in “parallel” Pacific cod fisheries in the adjacent waters of the State of Alaska. The referenced EA describes the groundfish species, Chinook salmon, marine mammal, seabird, habitat and ecosystem components of the GOA environment. For each component, the EA also describes the possible effect of a Chinook salmon PSC limit set at various levels. The analyzed cap levels range from 5,000 to 12,500 Chinook salmon PSC per year across all GOA non-pollock trawl fisheries, compared to the existing management regime of no Chinook salmon PSC cap. The range of annual PSC limits that the fishery could experience under the Council’s PA includes the range of scenarios possible when applying the uncertainty pool buffer – that is, 7,500 or 8,500 Chinook PSC per year, but not more than an average of 7,500 over a set of consecutive years.

Regulatory Impact Review

Any of the alternatives could directly affect the amount of Chinook salmon PSC that is available to the GOA non-pollock trawl CV fleet at a given point during the year. The analysis focuses on whether, and to what extent, the considered alternatives increase the likelihood of non-pollock trawl fisheries closing as a result of Chinook PSC limits being reached. The direct impact of any potential closure is roughly measured in terms of when the fishery might close, and how much groundfish is typically harvested by the sector after that point in the season. As before, analysis of potential closures is based on historical PSC data, which varies from year to year without a discernible trend.

Downstream effects, which are no less important, include potential changes in the amount of product delivered to shore-based plants at certain times in the year, changes to employment opportunities at fishery-supporting businesses in GOA port communities, and state and municipal tax revenues. These impacts are treated qualitatively, and have been presented in greater detail in the original RIR (NPFMC 2013, Section 4.7).

Alternative 1

Over the course of the Rockfish (Pilot) Program, the RP CV sector has taken more than 1,040 Chinook salmon only once, in 2008. Aside from that high PSC year, the RP CV sector would be carrying 1,360 allowable Chinook PSC. Median Chinook salmon PSC for the sector was 795 per year, meaning that 405 Chinook PSC would go unused in any sector; the analysis notes that Chinook PSC levels varied widely from year to year, but were typically well below the base apportionment of 1,200.

Using the RP CV sector's highest recorded level of Chinook PSC (1,649 in 2008) to gauge the maximum potential impact, the fishery would have been closed at the end of May. In a characteristic year, the RP CV sector harvests roughly 5,700 mt of groundfish from June to mid-November, valued at around \$10 million in gross first wholesale revenues, or around two-thirds of the average annual groundfish revenue generated in the sector. Years and months of especially high Chinook salmon PSC encounter did not correlate to greater harvest or revenue. As a result, the analysis concludes that fishing in a PSC-intensive manner is not necessarily beneficial to gross productivity, though it could reduce costs associated with avoiding salmon.

If the Council chooses the no action alternative, the non-RP CV sector would be limited to 2,700 Chinook salmon PSC for the entirety of its GOA non-pollock trawl activity. The non-RP CV sector has, on average, taken 2,234 Chinook salmon per year since 2007, with a median value of 1,944 per year. The sector's Chinook encounter is concentrated from March to May, in the arrowtooth flounder and rex sole fishery, and in September and October, during the Pacific cod B season and the beginning of the fall shallow water flatfish fishery; historical PSC use from June through August has been very low. If future outcomes resemble the non-RP CV sector's experience from 2007 to 2012, fishery closures may occur in years of above average Chinook PSC encounter. Two of six analyzed years would have experienced a closure, with the greatest observed forgone harvest impact being an October closure that precluded 59% of Pacific cod B season production. The potential impact of the Council's PA in a high-Chinook PSC year would be on the order of 5,500 mt of forgone groundfish harvest, with a wholesale value loss of around \$5.6 million.

Under the uncertainty pool mechanism, the non-RP CV sector could qualify for an additional 360 Chinook salmon PSC, which would not have kept the sector's fall fisheries open for the entirety of its highest PSC years. However, if the sector were approaching its base apportionment of 2,700 Chinook around the beginning of September, the additional PSC would likely have forestalled closure by four to six weeks at the beginning of the valuable Pacific cod season. The sector's typical weekly PSC during that time of the year is around 50 Chinook, and average weekly wholesale revenues are the relatively high

– around \$1 million – when that season opens. If the sector made it through the Pacific cod B season on its base apportionment of PSC (2,700) but reached the limit in early or mid-October, the supplemental uncertainty buffer earned in the previous year would likely extend the fishing season by only two or three weeks, as average weekly PSC increases to around 150 Chinook salmon once shallow water flatfish activity predominates. The timing of GOA fall fisheries is difficult to predict; in recent years, the starting date for the fall Pacific cod season has been affected by voluntary cooperative decisions to delay the start of the pollock C season in order to reduce Chinook PSC in that hard-capped fishery.

With a hard cap of 2,700 Chinook salmon PSC and no potential rollover, the non-RP CV sector's ability to make deliveries in the fall could hinge upon its ability to limit PSC in April and May. The sector would not likely face a fall closure if spring PSC conforms to the monthly average levels – combining to equal 850. Looking to the future, spring Chinook salmon PSC in the non-RP CV sector could increase relative to historically observed levels, due to forthcoming changes in trawl halibut PSC management. Upon the implementation of the proposed rule for GOA Amendment 95 (revised halibut PSC limits), available deep-water and shallow-water complex halibut PSC from the second season allocation may be combined and used in either complex from May 15 to June 30. This change is likely to increase the amount of halibut mortality available to flatfish trawlers in May and June, and result in some amount of Chinook salmon PSC counted against the non-RP CV hard cap that was not being taken during the analyzed historical period. Thirty-three of the 93 vessels that were active at some point since 2007 in the GOA non-pollock trawl fishery displayed no participation in the non-pollock fall fisheries, though 19 of those 33 vessels did fish for pollock after September. These vessels may have a low incentive to alter their fishing behavior or refrain from expanding their spring flatfish harvest in order to reserve available PSC for the end of the year.

Alternative 2

By reincorporating the rollover provision, Alternative 2 introduces an element of strategic behavior into the business planning of the RP fleet and cooperatives. By and large, vessels participating in the RP CV fishery also participate in the fall non-pollock trawl fisheries. As such, these vessels have an interest in ensuring that sufficient Chinook PSC is available to target Pacific cod and flatfish in the post-September months.

Aside from the year of particularly high Chinook PSC in the RP CV sector (2008), the average rollover to the fall non-RP CV sector would have been between 314 and 418 Chinook PSC, depending on the selected option (roll over “all but” 104, 156, or 208 unused Chinook PSC). The maximum rollover in any year would have been 728 Chinook PSC, observed under Option 1. The minimum rollover for a year in which the RP CV sector stayed below its 1,200 Chinook cap would have been 27 Chinook PSC, observed under Option 3. Noting that the non-RP CV sector averages 891 Chinook PSC after October 1, it appears unlikely that the amount rolled over from the RP CV sector would, by itself, fully meet fall PSC demand in all years. Depending on pre-October Chinook encounter in the non-RP CV sector, and how much PSC remains from the sector's own apportionment, the October 1 rollover could extend the Pacific cod B season and fall flatfish fisheries. If, after receiving the rollover, the non-RP CV sector initially targets Pacific cod, the fishery would likely stay open for at least a month. If the non-RP CV sector uses the rollover to target flatfish, or a mix of flatfish and Pacific cod, the fishery would likely be extended by around one to three weeks.

If Chinook salmon PSC in the RP and non-RP CV sectors is low, the RP sector will prosecute the Program fishery in much the same way as it has done historically – avoiding Chinook and halibut PSC to the extent practicable, while focusing on fully harvesting TACs for the primary and secondary managed species allocated to the Program. If Chinook PSC in the RP sector is low or average, and PSC in the non-RP sector is high, the RP CV sector would likely continue prosecuting the Program fishery as it has done

in the past, with moderate confidence that the rolled over amount of Chinook PSC – on the order of 250 to 550 Chinook salmon – should be sufficient to see the fall non-RP fishery through the valuable Pacific cod B season. Finally, if Chinook PSC is high in both the RP and the spring/summer non-RP fishery, the RP CV sector will face a business decision at the inter-cooperative level of weighing RP harvest against some marginal amount of Pacific cod and flatfish harvest.

A subset of the CV fleet does not participate in the fall non-pollock fisheries; these are overwhelmingly non-RP vessels. It might be the case that these vessels will fish in a manner that maximizes spring and summer flatfish harvest at the cost of additional Chinook PSC that is debited against the non-RP CV apportionment. If this behavior does emerge, the RP CV sector might feel a burden to “provide” a rollover to support fall fishing. That feeling could re-order some of the priorities in Rockfish co-op management. A rollover creates at least some possibility of relief for vessels that depend on fall fishing if a race for bycatch does emerge.

Analysis of the action alternatives also considers whether reincorporating a rollover provision will create accounting problems in administering the uncertainty pool element of the program. If the RP CV sector carries over 160 Chinook into Year 2, and then uses that extra allowance in a high-PSC year, then those 160 fish must have been truly “saved” in Year 1. If there is a possibility that the non-RP CV fishery will use *all* of the Chinook PSC available to it, then the integrity of the RP CV sector’s uncertainty buffer is best maintained by selecting a rollover option that holds back at least 160 Chinook PSC. This would be accomplished under Option 3 to Alternative 2 (roll over “all but 208” unused Chinook PSC).

Alternative 3

The Council chose to consider holding back precisely 160 Chinook salmon in the RP CV sector because that is the amount of Chinook in the sector’s uncertainty buffer. Keeping those 160 Chinook allowances within the sector prevents a scenario where the PSC that is marked for possible use in case of high-PSC during the following year is, instead, caught by the non-RP CV sector in the fall.

Alternative 3 and Option 2 to Alternative 2 differ only in that Alternative 3 requires four additional Chinook salmon PSC to remain with the RP CV sector at the time of the October 1 rollover. As such, the potential impacts on fleet behavior and Chinook avoidance incentives are much the same as those described in the previous section. In short, most RP CVs participate in the non-Program fall fisheries, so they have an incentive to preserve a viable rollover to support that activity. On the other hand, a significant number of non-RP CVs do not participate in the fall at all, and therefore have little cause not to fish up to their sector’s base apportionment of 2,700 Chinook by the end of the spring flatfish season. Those vessels have equally little incentive to limit Chinook PSC to the non-RP CV sector’s uncertainty pool threshold (2,340), since the benefits of any Year 2 uncertainty buffer are most valued in the fall. In broad terms, the responsibility for keeping the post-September fisheries open could fall on the RP CVs, which forces the cooperatives to make a harvest-for-harvest trade-off decision.

Alternative 4

There would be no “hold back” requirement under Alternative 4, because with no Year 2 uncertainty buffer to protect against potential double-counting, there is no reason to strand unused Chinook PSC in the RP CV sector. Historical Chinook PSC levels in the RP CV sector (an average of 843, median of 795) suggest that a rollover is likely to occur in most years.

Managing bycatch with hard caps carries an inherent perverse incentive to utilize PSC up to the limit. The uncertainty pool mechanism was, in part, included in the PA to lower the level of Chinook PSC up to which a sector would be indifferent. The analysis suggests that the RP CV sector is likely to actively avoid Chinook PSC and provide a rollover, since on average 87% of the CVs that are active in the

Rockfish Program also participate in the non-RP fall fisheries; those that do not fish in the fall still have an interest in maintaining positive business relationships with their cooperative partners.

The cooperatives' greatest challenge under Alternative 4 will be when to execute the rollover. The timing of any coordinated check-out by the RP CV cooperatives would be determined by three factors: (1) the amount of allocated RP harvest quota remaining at a given time; (2) the amount of Chinook PSC remaining in the non-RP CV sector's apportionment, which is largely determined by the amount of Chinook salmon taken in the April flatfish fishery; and (3) the anticipated start date for the Pacific cod B season, or the related start date for the pollock C season.

Given the fact that *all* RP cooperatives must check out in order to roll over Chinook PSC, it is possible that one cooperative could hold up the rollover in order to finish harvesting its Program quota. If this issue were to arise, it would likely force an inter-cooperative decision in September, when both pollock and Pacific cod fisheries could potentially be open. If the need for a rollover looks imminent, cooperatives are more likely to shift their Program harvest to earlier in the year, as opposed to leaving it unharvested. Shifting this harvest to earlier in the summer could impact processor operations, where predictability and distribution of product delivery over time are not only among the objectives of the Rockfish Program, but also important to employment patterns, product value and profitability. The PSC impact of moving up RP harvest to accommodate an earlier rollover are not clear; Chinook PSC rates in the Program tend to be lower in July and August than in September, but racing to harvest rockfish quota quickly could carry a marginal trade-off in efforts made to avoid Chinook salmon.

In a characteristic year, the non-RP CV sector uses 930 Chinook PSC by the end of April, and 1,141 by the end of August. Neither one of those benchmark levels would raise concern in the RP CV sector about the need to terminate the Program fishery early in order to support the opening of the Pacific cod B season. However, spring and late-summer PSC totals have ranged up to around 2,500 Chinook in certain years. If the RP CV sector experiences negative effects from shifting or curtailing its harvest in order to fund PSC demand in the fall fisheries, it is likely because the non-RP CV sector recorded high PSC rates in the spring. If those high PSC rates were the result of either increased effort or revenue-maximizing PSC-intensive practices, then one might conclude that the non-RP participants who do not fish in the fall expropriated rents from the rest of the CV fleet.

1 Introduction

In June 2013 the North Pacific Fishery Management Council (Council) took action recommending measures to control Chinook salmon prohibited species catch (PSC) in all trawl fisheries of the Central and Western Gulf of Alaska (GOA), except the directed pollock fishery which already has a PSC cap. The Council's preferred alternative (PA) would set an annual hard cap of 7,500 Chinook salmon, to be apportioned between three sectors of the trawl fleet. A sector would be closed if it attains its apportioned amount of the total hard cap.¹ Based on recent historical performance, an apportioned cap of 7,500 Chinook salmon would have impacted sectors through fishery closure in some, but not all, analyzed years. The PA included a provision, termed in the Council's motion as the "uncertainty pool," whereby a sector that performs to a stricter level of Chinook salmon avoidance would have access to some additional Chinook PSC in the following year. This feature is intended to provide an incentive for Chinook salmon avoidance in every year, even when the hard cap is not expected to pose a constraint; it also provides sectors that successfully limit Chinook PSC with a modest amount of relief in the case of a single unpredictably high year of Chinook salmon encounter, while maintaining the integrity of the maximum average annual PSC that the Council has deemed allowable.

The Council considered but did not select an option under the hard cap alternative allowing Chinook salmon PSC that went unused in the Central GOA Rockfish Program (Rockfish Program) to be utilized in the non-pollock trawl fisheries that occur later in the calendar year. As its rationale for not selecting this "rollover" provision, the Council indicated that including the bycatch avoidance incentives of the uncertainty pool was of a higher priority, and that the existing analysis did not sufficiently consider whether both the uncertainty pool and the rollover provision could be implemented in the same program without compromising the efficacy of one or both of the program features.

In its June 2013 motion, the Council expressed its intent that any final action resulting from this analysis be incorporated into the final rule for Chinook salmon bycatch management in the GOA non-pollock trawl fisheries. Selecting the 'no action' (status quo) alternative from those described in this analysis would result in a final Council recommendation identical to the PA selected in June, relevant parts of which are detailed below. The Council's PA was based on background and analysis presented in a public review document (NPFMC 2013); the background information and relevant, unaltered conclusions contained in that document will be incorporated by reference throughout this analysis.

An RIR/EA/IRFA provides assessments of the economic benefits and costs of the action alternatives, as well as their distribution (the RIR), the environmental impacts of an action and its reasonable alternatives (the EA), and the impacts of the action on directly regulated small entities (the IRFA). This RIR/EA/IRFA addresses the statutory requirements of the Magnuson Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), the National Environmental Policy Act (NEPA), Presidential Executive Order 12866, and the Regulatory Flexibility Act. An RIR/EA/IRFA is a standard document produced by the North Pacific Fishery Management Council (Council) and the National Marine Fisheries Service (NMFS) Alaska Region to provide the analytical background for decision-making.

This document contains elements of a Regulatory Impact Review/Environmental Assessment/Initial Regulatory Flexibility Analysis (RIR/EA/IRFA). The document is structured to provide the Council and the public with sufficient information to determine what action to take (including a no action alternative) in order to incorporate a rollover provision into the existing PA. Required elements of an RIR/EA/IRFA that are not included in this document have been previously addressed in the analysis that supported the existing PA (NPFMC 2013).

¹ The details of the Council's preferred alternative are further described in Section 2.1.

Section 2 of this document describes the alternatives to be considered for Council action. Section 3 summarizes the EA that was presented to the Council in June 2013. This section outlines what is known and unknown about the link between Chinook salmon trawl bycatch in the GOA and the health of Chinook salmon stocks in Alaska. The EA also analyzes whether or not the considered alternatives are likely to constitute a significant impact on other components of the environment, including other fish species, marine mammals, seabirds, habitat, and the GOA ecosystem at large. Section 4 is the RIR, which provides background on the sectors of the GOA trawl fishery relevant to this action, and analysis of the probable impacts of each considered alternative. Impact analysis is focused on how the alternatives would affect fleet behavior, and whether or not incorporating the considered alternatives into the Council's preferred alternative will interfere with the intent of program elements already selected by the Council. Regulatory impacts on other stakeholder groups are largely incorporated by reference from the RIR presented to the Council in June 2013 (NPFMC 2013). Subsequent versions of this analysis will include an IRFA in Section 5, once the Council has articulated a preliminary preferred alternative for this action.

1.1 Purpose and Need

Following the selection of a preferred alternative for implementing a Chinook salmon PSC hard cap in the GOA non-pollock trawl fisheries, Council requested an analysis of alternatives "to address the Council's inability to combine both an uncertainty buffer ["uncertainty pool"] and a rollover of Chinook [PSC] from the Rockfish Program catcher vessel fleet in its Preferred Alternative for the GOA Trawl Chinook bycatch cap."² The Council noted that there may be a net benefit in allowing unused Chinook salmon PSC to rollover from the catcher vessel (CV) sector apportionment for the Rockfish Program to support non-Rockfish Program CV fishing activity in the fall. The Council also acknowledged that the number of Chinook salmon PSC apportioned to the Rockfish Program CV sector in the PA (1,200 fish) is greater than the sector's historical average PSC use, and that this amount had been proposed with some sort of within-year rollover in mind. An effectively large PSC allowance may alter the incentive for the Rockfish Program CV sector to minimize Chinook salmon bycatch. Moreover, if PSC usage in the Rockfish Program CV sector is significantly lower than 1,200 Chinook, the unused amount would be, in effect, a PSC retirement that may be viewed as salmon savings over and above the Council's intent in setting an apportioned annual hard cap at the 7,500 Chinook level.

The need for further analysis stems from the Council's desire to ensure that the additional flexibility provided by a within-year PSC rollover provision will not reduce the Chinook avoidance incentives designed into the uncertainty pool mechanism. Further, any program that implements both an uncertainty pool and a within-year rollover should not allow the portion of unused PSC that qualified the Rockfish Program CV sector for the following year's uncertainty pool to be taken later in the same year by the non-Rockfish Program CV sector. Finally, the inclusion of a rollover provision should not create any scenario where average annual Chinook PSC is greater than 7,500 over a period of consecutive years.

1.2 Bycatch and Prohibited Species Catch Terminology

Bycatch, as defined by the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act; 16 U.S.C. § 1802(2)), "means fish which are harvested in a fishery, but which are not sold or kept for personal use, and includes economic discards and regulatory discards". The term "regulatory discards" refers to harvested fish "which fishermen are required by regulation to discard whenever caught, or are required by regulation to retain but not sell."

² Council motion. June 11, 2013

Within the GOA Groundfish FMP, several economically, ecologically, and/or culturally important fish species are identified, and their capture is required to be minimized and retention is prohibited³. These “Prohibited Species” include all five species of Pacific salmon, Pacific herring, several economically important king crab and Tanner crab species, and Pacific halibut. The Secretary, upon the recommendation of the Council, determined that sufficiently compelling need existed within the management contexts of the GOA Groundfish FMP (as well as the FMP for the Groundfish Fishery of the Bering Sea and Aleutian Islands) to specifically differentiate prohibited species catch (PSC) from incidental removals of other fish species (i.e., bycatch). These two distinct categories of unintended removals are separately monitored and controlled under the Groundfish FMP.

2 Description of Alternatives

The alternatives that are analyzed in this document were approved by the Council in June 2013. They are listed below, and described in detail in the sections that follow. These alternatives propose management measures that would apply exclusively to the catcher vessel sector in the directed non-pollock trawl fisheries in the Western and Central Gulf of Alaska.

Alternative 1: No action.

Alternative 2: The addition of the rollover provision as described in the EA/RIR to the Rockfish Program CV Chinook PSC cap and uncertainty pool.

Alternative 3: The addition of a provision allowing the rollover of all but 160 Chinook PSC and a Rockfish Program CV uncertainty pool.
[Staff note: Council clarified that such a rollover would occur on October 1]

Alternative 4: Rollover all Chinook PSC remaining in the Rockfish Program CV Chinook PSC cap when all Rockfish cooperatives have checked-out of the fishery but no later than November 15, and no uncertainty pool.
[Staff note: Council clarified that “no uncertainty pool” would only apply to the Rockfish Program CV sector]

For the purpose of this follow-on action, the analyst considers the status quo to be the Council’s preferred alternative for a GOA non-pollock trawl Chinook salmon PSC limit, described in the motion approved by the Council in June 2013. The contents of that motion are described below, with focus on points relevant to this action. The rationale for this approach is that selecting no action from this set of alternatives would result in a final recommendation on Chinook salmon PSC limits consisting of the elements in the preferred alternative.

2.1 Alternative 1: No action

Selecting the “no action” alternative would make the Council’s preferred alternative that emerged from the June 2013 meeting the final recommendation for a proposed rule on Chinook salmon PSC limits in the Western and Central GOA non-pollock trawl fisheries. The PA sets a combined annual hard cap at 7,500 Chinook salmon for the three identified harvest sectors as they target non-pollock groundfish species in the regulated areas. Fishing will be closed for a sector if it reaches its apportioned amount of the hard cap.

The three sectors defined in the Council’s PA are the GOA catcher/processors (CP), catcher vessels that are declared fishing under the Rockfish Program (RP CV), and catcher vessels that are not fishing under

³ Except when retention is authorized by other applicable law for biological sampling or for programs such as the Prohibited Species Donation Program.

the Rockfish Program (non-RP CV). Based on historic average Chinook salmon bycatch, the PA apportions the combined annual hard cap between the CP and CV sectors, and further subdivides the CV sector apportionment between RP trips and all other CV fishing activity.

The Chinook salmon PSC limit for all CPs is set at 3,600 fish per year. No more than 66% of this amount may be taken before June 1 (2,376 Chinook salmon). None of the action alternatives analyzed in this document would modify the preferred alternative for a PSC limit in the CP sector.

Of the 3,900 Chinook salmon PSC apportioned to the CV sector, 1,200 are set aside for trips by vessels fishing in the Rockfish CV sector that are under the authority of a Rockfish cooperative fishing quota (CQ) permit. This apportionment to the RP CV sector is not further allocated among the specific cooperatives. Reaching the limit would close all CV fishing under the Rockfish Program for the year. Unused Chinook PSC would not become available to support non-RP CV fishing in any case. The difference between the Chinook taken in the RP CV sector and the limit of 1,200 fish would be, in essence, retired at the point when either (1) all RP CV cooperatives have checked-out of the Program for the year, or (2) after November 15, whichever comes first. RP cooperatives would check out of the fishery if they reach their limits on halibut PSC or on allowable groundfish catch. All other CV activity in the non-pollock trawl fisheries, from January 20 through December 31, would be limited by a Chinook PSC hard cap of 2,700 fish.

The Council’s preferred alternative includes a provision to incentivize taking fewer Chinook PSC than the amount set by the limit, while also providing sectors that perform well with a moderate amount of flexibility around their PSC apportionment in the case of a subsequent year with high PSC encounter. Termed the “uncertainty pool” in the PA, this mechanism allows any sector that records less than its proportional share of a 6,500 Chinook salmon total hard cap in one year to access up to its proportional share of 1,000 *additional* Chinook in the following year, if that sector surpasses its base apportioned PSC limit. This provision could be thought of as an insurance policy that must be earned in every year. A sector that utilizes its apportioned share of the uncertainty pool, earned in the previous year, would in the following year return to fishing under a simple hard cap equal to its apportioned share of the 7,500 Chinook PSC limit.

Table 2-1 shows the apportionment of the total Chinook PSC limit to each of the three sectors defined in the preferred alternative. The uncertainty pool threshold is the Chinook avoidance performance level that each sector must not exceed in order to have the benefit of an earned PSC buffer in the following year. For each sector, the size of that earned relief is listed as the uncertainty pool buffer. Under the preferred alternative, a sector’s performance in relation to the uncertainty pool threshold does not affect, nor is it affected by, the performance of other sectors.

Table 2-1 Chinook salmon PSC Limit apportionment, uncertainty pool performance thresholds and buffer sizes

		Rockfish Program Catcher Vessels	Non-Rockfish Program Catcher Vessels	Catcher/Processors
<i>Apportionment Share</i>		16%	36%	48%
Base PSC Limit	7,500	1,200	2,700	3,600
Uncertainty Pool Threshold	6,500	1,040	2,340	3,120
Uncertainty Pool Buffer	1,000	160	360	480

Table 2-2 illustrates how a sector’s annual PSC limit might vary from one year to the next, given the performance incentives and the limitations designed into the mechanism. Note that if a sector performs within its uncertainty pool threshold in a year (Year 1), and continues to do so in subsequent years (Year 2), the sector’s effective maximum allowable amount of PSC will never exceed its base PSC limit plus its uncertainty pool buffer. A sector that earns an uncertainty buffer for Year 2 is held to the same performance standard (threshold) that it faced in Year 1 in order to maintain the benefit of the uncertainty buffer in the following year (Year 3). These limits guarantee that the incentive to avoid Chinook salmon does not decrease over time, even if performance has been good. Moreover, there is no scenario in which a sector’s PSC exceeds its apportioned amount of the base PSC limit when averaged over a set of consecutive years.⁴ This is ensured by the fact that, in order to earn the uncertainty pool buffer in Year 2, the sector would have had to come in under its base PSC limit by *at least* the buffer amount in Year 1.

Table 2-2 Interdependency of annual sector PSC limits under the uncertainty pool mechanism

	If Year 1 PSC...	Then in Year 2...	If Year 2 PSC...	Then in Year 3...
Rockfish Program Catcher Vessels	<u>Path A:</u> $1,040 \leq \text{Yr.1} \leq 1,200$	Limit = 1,200	$1,040 \leq \text{Yr.2} \leq 1,200$	Limit = 1,200
			or $\text{Yr.2} < 1,040$	Limit = 1,200 + 160
	<u>Path B:</u> $\text{Yr.1} < 1,040$	Limit = 1,200 + 160	$1,040 \leq \text{Yr.2} \leq 1,360$	Limit = 1,200
			or $\text{Yr.2} < 1,040$	Limit = 1,200 + 160
Non-Rockfish Program Catcher Vessels	<u>Path A:</u> $2,340 \leq \text{Yr.1} \leq 2,700$	Limit = 2,700	$2,340 \leq \text{Yr.2} \leq 2,700$	Limit = 2,700
			or $\text{Yr.2} < 2,340$	Limit = 2,700 + 360
	<u>Path B:</u> $\text{Yr.1} < 2,340$	Limit = 2,700 + 360	$2,340 \leq \text{Yr.2} \leq 3,060$	Limit = 2,700
			or $\text{Yr.2} < 2,340$	Limit = 2,700 + 360
Catcher/Processors	<u>Path A:</u> $3,120 \leq \text{Yr.1} \leq 3,600$	Limit = 3,600	$3,120 \leq \text{Yr.2} \leq 3,600$	Limit = 3,600
			or $\text{Yr.2} < 3,120$	Limit = 3,600 + 480
	<u>Path B:</u> $\text{Yr.1} < 3,120$	Limit = 3,600 + 480	$3,120 \leq \text{Yr.2} \leq 4,080$	Limit = 3,600
			or $\text{Yr.2} < 3,120$	Limit = 3,600 + 480

Finally, the Council’s PA includes a full retention requirement for all salmon species brought onboard during non-pollock trawl fishing. This element of the PA would neither be directly, nor indirectly, affected by any of the alternatives considered in this document.

2.2 Alternative 2: Add to Council’s preferred alternative the previously analyzed rollover provision for CVs

The public review document upon which the Council based its selection of a preferred alternative (NPFMC 2013) analyzed an option to roll over some amount of any unused Chinook salmon PSC from the Rockfish Program fishery to the other non-pollock trawl fisheries. Staff assumes that “unused” PSC is only counted in relation to the RP CV sector’s base apportionment of 1,200 Chinook, and not any of the 160 Chinook that it may be carrying in the form of an uncertainty buffer earned in the previous year. The Council’s alternative proposed that such a rollover would occur on October 1, and the amount would be based on Rockfish Program PSC usage up to that point. Selecting Alternative 2 would add the CV element of that option to the PA, and would not alter the uncertainty pool mechanism described above.

The previous analysis considered rollovers in the amount of “all but” 200, 300, or 400 of the remaining Rockfish Program Chinook salmon PSC, as of the specified date. This rollover option would have

⁴ If, for example, the RP CV sector recorded 1,039 Chinook PSC in Year 1, 1,360 in Year 2, and 1,200 in every year after that, then the average annual PSC for Years 2 through ‘X’ would be greater than 1,200, but the average including Year 1 would be less than 1,200.

included both the CP and CV sectors, and would have apportioned the year's rollover amount in the same manner used to apportion the total annual PSC limit between sectors. The Council's preferred alternative would apportion 52% of Chinook PSC to CVs. Since this alternative would only create a rollover mechanism for the CV fleet, the rollover amounts under consideration are similarly adjusted.

If Alternative 2 were selected, the Council would need to choose one of three potential amounts of the unused Rockfish Program CV Chinook salmon PSC to roll over for use in the fall non-Rockfish Program non-pollock CV trawl fisheries:

- Option 1: All but **104** of the remaining Rockfish Program CV Chinook salmon PSC;
- Option 2: All but **156** of the remaining Rockfish Program CV Chinook salmon PSC;
- Option 3: All but **208** of the remaining Rockfish Program CV Chinook salmon PSC.

Staff has assumed that any Chinook salmon PSC taken in the Rockfish Program CV sector between October 1 and November 15 would be debited from the amount of PSC that is not rolled into the non-Rockfish Program fall fisheries – i.e., the pool of between 104 and 208 Chinook salmon.

The actual amount of Chinook PSC to be rolled over in any given year would depend on performance by the Rockfish Program CV fleet, in aggregate. While it is not possible to forecast Chinook PSC levels, Table 2-3 presents annual PSC outcomes since the implementation of the Rockfish Pilot Program in 2007. The RP CV sector recorded 18 Chinook salmon after October 1 in 2007; in all other years, the sector took all Chinook PSC before the proposed rollover date. Table 2-4 shows how many Chinook salmon would have been made available to the non-Rockfish Program CV fall fisheries under each of the Alternative 2 options, illustrating the annual variability in PSC levels. These figures provide a sense of how many Chinook salmon were taken in the RP CV sector each year, in relation to the 1,200 Chinook apportioned to the sector in the preferred alternative. However, while the fleet took measures to avoid Chinook salmon, it is important to note that a PSC hard cap was not in place, and salmon mitigation was only one among several operating goals.

Table 2-3 Annual Chinook salmon PSC usage by the Rockfish Program CV fleet

Year	Chinook PSC
2007	483
2008	1,649
2009	773
2010	965
2011	368
2012	817
Average	843

Table 2-4 Historical October 1 Chinook salmon PSC rollover amounts under Alternative 2, had the Alternative been in place from 2007 through 2012

Year	Chinook PSC rollover		
	Option 1	Option 2	Option 3
2007	631	579	527
2008	n/a	n/a	n/a
2009	323	271	219
2010	131	79	27
2011	728	676	624
2012	279	227	175
Average*	418	366	314

* Includes only years in which a rollover would have occurred

2.3 Alternative 3: Add to Council’s preferred alternative a CV rollover provision for all but 160 Chinook salmon PSC

Alternative 3 is functionally similar to Alternative 2 in that it would, on October 1, allow a portion of unused Chinook PSC from the Rockfish Program CV sector to be rolled over for use in the fall non-Rockfish Program CV fisheries. As above, selecting Alternative 3 would not alter the design of the uncertainty pool mechanism. Alternative 3 would allow the rollover of all but **160** of the remaining Chinook PSC apportioned to the Rockfish Program CV sector. As with Alternative 2, staff assumes that any Chinook PSC occurring in the Rockfish Program CV sector between October 1 and November 15 would be debited against the pool of 160 Chinook salmon that remains with the sector. Table 2-5 shows how many Chinook salmon would have been made available to the non-Rockfish Program CV fall fisheries between 2007 and 2012; these figures are not significantly different from those under Alternative 2, Option 2.

Table 2-5 Historical October 1 Chinook salmon PSC rollover amount under Alternative 3, 2007 through 2012

Year	Chinook PSC rollover
2007	575
2008	n/a
2009	267
2010	75
2011	672
2012	223
Average*	362

* Includes only years in which a rollover would have occurred

2.4 Alternative 4: Add to Council’s preferred alternative an unlimited CV rollover provision; remove Rockfish Program CV sector from the uncertainty pool

Alternative 4 would allow all Chinook salmon PSC that was not utilized by the Rockfish Program CV sector to be rolled over for use by CVs that are not operating under the Rockfish Program. This rollover would take place once all RP CV cooperatives have been officially “checked out” of the Program by their respective cooperative manager, or on November 15 – whichever occurs first.

Alternative 4 would also remove the Rockfish Program CV sector from the uncertainty pool mechanism. This is necessary because using *all* of the Chinook PSC rolled over from the RP CV sector to the fall non-Rockfish fishery would include catching the 160 Chinook salmon⁵ that the RP CV sector avoided catching in order to earn its share of the uncertainty buffer. Allowing the RP CV sector to access additional Chinook PSC in “Year 2” would essentially reward the Rockfish Program portion of the CV sector for avoiding Chinook that the CV fleet, or a portion of the CV fleet, caught later in the year.

3 Environmental Assessment

The proposed action includes a no action alternative and three alternatives that would constitute a minor change to a previously analyzed action, the Council’s preferred alternative (June 2013). The public review

⁵ Refer back to Table 2-1: 160 = 1,200 – 1,040 Chinook PSC, or the difference between the RP CV sector’s share (16%) of the base PSC limit (7,500) and the sector’s uncertainty pool threshold (6,500).

document used in selecting the PA included an environmental assessment (EA) that addressed the probable environmental impacts of the previously analyzed alternatives (NPFMC 2013, Section 3). That analysis is briefly summarized below, and incorporated here by reference. A more detailed description of the considered resource components is available in the Alaska Groundfish Fisheries Harvest Specifications Environmental Impact Statement (EIS) (NMFS 2007), and the Final Programmatic Supplemental EIS on the Alaska Groundfish Fisheries (NMFS 2004).

None of the alternatives considered here would allow annual Chinook salmon PSC to exceed the levels that were examined in the EA prepared for the analysis referenced above. By extension, the proposed action will have no effect on the human environment, as defined in NAO 216-6, beyond those examined in the existing EA.

As described in the EA that informed the Council's selection of a preferred alternative, the proposed action affects vessels – specifically catcher vessels, here – fishing in the federal non-pollock groundfish trawl fisheries in the Central and Western GOA, and may also affect vessels fishing in “parallel” Pacific cod fisheries in the adjacent waters of the State of Alaska. The referenced EA describes the groundfish species, Chinook salmon, marine mammal, seabird, habitat and ecosystem components of the GOA environment. For each component, the EA also describes the possible effect of a Chinook salmon PSC limit set at various levels. The analyzed cap levels range from 5,000 to 12,500 Chinook salmon PSC per year across all GOA non-pollock trawl fisheries, compared to the existing management regime of no Chinook salmon PSC cap. The range of annual PSC limits that the fishery could experience under the PA includes the range of scenarios possible when applying the uncertainty pool buffer – that is, 7,500 or 8,500 Chinook PSC per year, but not more than an average of 7,500 over a set of consecutive years.

3.1 Summary of effects on groundfish species

A lower hard cap may result in the non-pollock trawl fisheries closing before the TACs are reached, while a higher hard cap would allow for groundfish fishing at current levels, and impacts would likely be similar to the fishery in its present state. If the groundfish TACs are not fully harvested, fishing will have less impact on the stocks, and there will be no significantly adverse impact on the groundfish stocks from the fisheries. If the implementation of a PSC limit curtails the fisheries, it is likely the fall seasons that will be most impacted, that is, fishing in the early part of the year is most likely to remain unchanged, while fishing patterns may be altered later in the year when the fisheries are approaching the PSC limit. Changing fishery patterns or seasonal changes in the timing of the fishing pressure may result in the fisheries focusing on different ages of groundfish than would otherwise have been taken. These changes, however, would be monitored and updated in future stock assessments. The risk to the stocks is considered minor, since conservation goals for maintaining spawning biomass would remain central to the assessments. The PA would affect neither the annual assessment process, nor the inseason monitoring of catch quotas. Thus any change in fishing patterns or the timing of fishing pressure would not be expected to affect the sustainability of the stocks. However, the change in fishing pattern could result in lower overall ABC and TAC levels, depending on how the age composition of the catch changed.

The PA is not likely to result in significant adverse impacts to groundfish stocks. Similarly, with respect to the ecosystem component and non-FMP species, the implementation of a PSC limit under the PA is not likely to increase fishing pressure. Even if there is a redistribution of effort to avoid Chinook salmon, the fishery will likely remain within the established footprint of the non-pollock trawl fishing grounds. If the fisheries close early because the PSC limit has been reached, impacts on these species may be reduced. The impacts of the PA are expected to be insignificant relative to the fishery managed with no PSC limit.

3.2 Summary of effects on Chinook salmon

The referenced EA describes Chinook salmon biology and ecological role, annual summary data on Chinook salmon PSC in non-pollock trawl fisheries, limitations on managers' knowledge of Chinook abundance and stock origin in the GOA, current Chinook assessment and management measures, as well as an overview of available information on Chinook stocks by area, including ESA-listed stocks and hatchery releases.

The impact of the GOA groundfish trawl fisheries on Chinook salmon was most recently analyzed in the Alaska Groundfish Fisheries Harvest Specifications Supplemental EIS (NMFS 2007). The non-pollock trawl fisheries have an adverse impact on Chinook salmon through direct mortality due to PSC. The EIS also considered impacts of the fisheries on the genetic structure of the population, reproductive success, and habitat, and concluded that it is unlikely that groundfish fishing has indirect impacts on these aspects of Chinook salmon sustainability. In addition, non-pollock trawl fishing activities are considered to have minimal and temporary effects on prey availability for salmon (NMFS 2005).

The Chinook salmon stock composition of the GOA non-pollock trawl fishery PSC is not available; however the GOA groundfish fisheries have been documented to catch Chinook salmon from both Cook Inlet, where run sizes have been below average, and Southeast Alaska. It is not possible to draw any correlation between patterns of PSC and the status of salmon stocks, especially given the uncertainty associated with estimates of PSC in the groundfish fisheries and the lack of data on river of origin of Chinook salmon PSC. This results in an inability to discern and accurately describe small scale impacts on particular individual stocks; nonetheless, it is understood that setting PSC limits will likely reduce the potential to impact salmon stocks in the aggregate, and therefore is likely to be beneficial to Chinook salmon stocks as a whole. There is also no evidence to indicate whether the groundfish fisheries' take of Chinook salmon is, or is not, causing escapement failures in Alaska rivers. Since in 2011, efforts have been underway to improve genetic sampling of salmon PSC in the GOA pollock fishery, which should, in time, allow for a better understanding of the stock composition of PSC in that GOA trawl target fishery.

To the unknown extent to which the PA benefits Chinook salmon stocks, a PSC limit may benefit commercial, sport and subsistence users of Chinook salmon. The referenced EA identifies a number of river systems in the action area – on the Alaska Peninsula, around Kodiak Island, and in Southcentral Alaska – where low salmon returns have led to management actions that closed or curtailed these non-trawl resource uses in 2012.

A PSC limit, and potential salmon savings in years of high Chinook salmon PSC, does not translate directly into adult salmon that would otherwise have survived to return to its spawning stream. Salmon caught as PSC in the GOA groundfish trawl fisheries are generally immature salmon, with an average weight varying between 5 and 9 pounds. Some proportion of the Chinook salmon caught as PSC would have been consumed as prey to other marine resources, or been affected by some other source of natural or fishing mortality. Unlike analyses of Chinook salmon PSC in the Bering Sea pollock trawl fishery, we do not possess sufficient GOA trawl PSC data to develop an adult equivalent (AEQ) model. Currently available data does not link the size of the Chinook salmon taken as PSC to a specific age-class. It is assumed that the non-pollock trawl fisheries could be catching Chinook salmon that originate from anywhere in Alaska or elsewhere, and it is not possible to estimate the proportion any stock has contributed to the Chinook salmon PSC in the analyzed fishery. Therefore our ability to assess the impacts of reducing salmon PSC on salmon populations is constrained.

Some information is available from genetic analysis of samples taken in the GOA groundfish fisheries, which originate primarily from the GOA pollock fishery. To date, the number of samples has not been sufficient to produce a stock composition analysis, but rather documents the presence of a particular

salmon stock in the Chinook salmon PSC. In 2011 (the most recent year for which analysis is available), GOA samples were predominantly from Chinook salmon stocks from British Columbia, the Pacific Northwest, the Northwest GOA, and coastal Southeastern Alaska. Coded wire tag (CWT) recoveries provide reliable documentation of the presence of specific salmon stocks in the Chinook salmon PSC. Due to sampling issues, CWT recoveries can neither be used to establish the relative abundance of stocks in the PSC, nor to estimate the number harvested from any one stock as PSC. While there are likely to be Chinook salmon taken in the GOA non-pollock trawl fisheries that originate in river systems with no tagging program, since 1995 CWTs have been recovered from British Columbia, Alaska, Oregon, Washington, and Idaho. Beginning in 2014, NMFS will institute sampling of Chinook salmon from randomly selected non-pollock trawl vessels in the GOA, which will provide some information on Chinook bycatch from those operations in the future.⁶

Under a PSC limit, especially if the attainment of the threshold appears to be imminent, the non-pollock trawl fleet may be active in making efforts to avoid high PSC rates, in order to preserve the opportunity to fully harvest the groundfish TACs. Efforts to avoid Chinook PSC could take a variety of forms. Particularly at the outset, these efforts may have limited effect, as participants have little understanding of the means of avoiding Chinook PSC. Yet, the adoption of a Chinook PSC limit likely will prompt efforts to gain better information concerning Chinook avoidance, improving the ability of participants to avoid Chinook in the long run. As information concerning Chinook avoidance is improved, participants may use that information to redirect effort to times and areas with lower Chinook catch rates. Over time, effort may become more concentrated in areas that experience lower Chinook salmon PSC rates and decrease (or be eliminated altogether) in areas of higher Chinook salmon catch rates. The extent of any redistribution of effort is difficult to predict and will depend not only on the distribution of Chinook salmon catch rates on the fishing grounds and the participants' ability to accurately estimate Chinook salmon catch rates, but also participants' flexibility to alter their temporal and spatial fishing behavior. It is possible that shifting the spatial or temporal distribution of the non-pollock trawl fisheries may impact some particular Chinook salmon stocks more than others, but as we do not currently know how effort may shift in the non-pollock trawl fisheries, nor the stock composition of Chinook salmon PSC, this impact is not possible to assess.

The EA develops a general conclusion that if Chinook salmon PSC is reduced in some years as a result of this action, there would likely be beneficial impacts on Chinook salmon stocks, and the harvesters and consumers of Chinook salmon, compared to current management.

3.3 Summary of effects on marine mammals and seabirds

The EA summarizes potential impacts of fishing on marine mammals, and references the GOA Halibut EA/RIR/IRFA (NPFMC 2012) as the most recent analysis of potential impacts from the GOA non-pollock trawl fisheries. That report concluded that the fisheries, as currently prosecuted, do not result in significantly adverse impacts to marine mammals in the GOA. The EA lists 22 pinniped, cetacean and sea otter species that are likely to occur in the GOA, and provides additional information on the status of ESA listed species (Steller sea lion, northern sea otter, Cook Inlet beluga whale, and Southern resident killer whale).

Marine mammals can be taken in groundfish fisheries by entanglement in gear (e.g., trawl, longline, and pot) and, rarely, by ship strikes for some cetaceans. Steller sea lion (western U.S.), Fin whale, and Northern elephant seal were taken in the GOA non-pollock trawl fisheries during the most recent five years of observer data that have been analyzed (Allen and Angliss 2012). In addition to these species, the List of Fisheries for 2011 reports that fin whale and northern elephant seal have been taken in previous

⁶ Draft 2014 Annual Deployment Plan for Observers in the Groundfish and Halibut Fisheries off Alaska

years in the GOA non-pollock trawl fishery, but not recently (75 FR 68468, November 8, 2010). Potential take in the GOA non-pollock trawl fisheries is well below the potential biological removal (PBR) level for all marine mammals for which PBR has been determined. Considering the number of marine mammals taken incidentally in the fishery in relation to the PBR, it is unlikely that incidental takes would impact the subsistence harvest of marine mammals.

The EA lists 38 species of seabirds that breed in Alaska, and an additional five species that occur in Alaskan waters during the summer months, combining for a total population of over 60 million birds. Additional information is provided on tracking and incidental take of ESA-listed short-tailed albatross. The EA references nine sources for more information on seabirds in Alaska's EEZ, including Chapter 9 of the Alaska Groundfish Harvest Specifications EIS (NMFS 2007) and Chapter 3 of the Programmatic Supplemental EIS for Alaska Groundfish Fisheries (NMFS 2004). The PSEIS identifies GOA groundfish fishery activities that may directly or indirectly affect seabird populations, including incidental take in fishing gear and vessel strikes, reductions in prey (forage fish) abundance and availability, disturbance to benthic habitat, discharge of processing waste and offal, contamination by oil spills, presence of nest predators in islands, and disposal of plastics, which may be ingested by seabirds. The referenced EA concludes that seabirds are taken by the GOA trawl fishery in minor amounts compared to population levels, and that overall prey availability is not affected at a level resulting in seabird population effects.

Although impacts to marine mammals and seabirds from commercial fisheries cannot be considered beneficial (incidental take, reduced prey availability, and increased disturbance are all adverse impacts), it is possible that the Council's PA could reduce the harmful effects of commercial fisheries on marine mammals and seabirds insofar as they reduce incidental take, competition for prey, or disturbance in cases where trawl fisheries are curtailed by Chinook PSC limits before TACs are reached.

3.4 Summary of effects on habitat and the ecosystem

The EA references the most recent Essential Fish Habitat (EFH) EIS (NMFS 2005), which describes the effects of GOA non-pollock trawl fisheries on benthic habitat and EFH. The EFH EIS describes the importance of benthic habitat, and the impacts of trawl gear (doors, sweeps and bobbins) on benthic habitat. The EA also mentions that the non-pollock trawl fisheries catch salmon prey species incidentally, though in small numbers relative to the overall population for those species. The EA, and the EFH EIS by reference, conclude that fishing activities have minimal and temporary effects on prey availability for salmon, benthic habitat and essential fish habitat as they are currently prosecuted. These impacts may be reduced under the PA in instances where a Chinook PSC limit curtails the length of the fishery. Even if Chinook PSC hot spots are identified and spatial fishing behavior shifts, fishing activity is expected to remain within the current footprint of the fishery. Other regulatory constraints on the fishery (e.g., seasonal TAC allocations and halibut PSC limits) should also limit any temporal redistribution of fishing effort to the current time period. Because the PA is not likely to result in significantly adverse effects to habitat, its impacts are likely insignificant.

Human activities, including commercial fishing, can influence the structure and function of marine ecosystems. Fishing may change predator-prey relationships and community structure, introduce foreign species, affect trophic diversity, alter genetic diversity, alter habitat, and damage benthic habitats. The GOA non-pollock trawl fisheries potentially impact the GOA ecosystem by relieving predation pressure on shared prey species (i.e., species which are prey for both groundfish and other species), reducing prey availability for predators of target groundfish, altering habitat, imposing PSC and bycatch mortality, or ghost fishing caused by lost fishing gear. Ecosystem considerations for the GOA groundfish fisheries are summarized annually in the GOA Stock Assessment and Fishery Evaluation report (Zador 2012).

The most recent Harvest Specifications EIS (NMFS 2007) concluded that the GOA non-pollock trawl fisheries, as they are currently prosecuted, do not produce population-level impacts to marine species or change ecosystem-level attributes beyond the range of natural variation. The Council's PA will either maintain the current overall level of groundfish harvest, or reduce it via Chinook PSC closures. As with habitat impacts, while the location and timing of fishing activities may undergo some localized changes, overall the fleets are constrained in the location and timing of the fisheries by other regulatory measures (e.g., seasonal allocations of TAC and halibut PSC). As a result, the PA is not likely to have a significant impact on the ecosystem.

3.5 Summary of cumulative effects

This document incorporates the analysis of the effects of past, present, and reasonably foreseeable future actions (RFFA) in the original EA by reference. Future effects include harvest of federally managed fish species and current habitat protection from federal fishery management measures, harvests from state managed fisheries and their associated protection measures, efforts to protect endangered species by other federal agencies, and other non-fishing activities and natural events. The most recent comprehensive analysis of RFFAs for the groundfish fisheries is in the Harvest Specifications EIS (NMFS 2007). RFFAs that may affect target and prohibited species are listed in Table 3-37 of the referenced EA (NPFMC 2013, p.79). These actions include, but are not limited to, area closures for crab protection, revised GOA halibut PSC limits, and early considerations of a quota-based system to provide the GOA trawl fisheries with the necessary tools to better manage PSC. Ongoing research efforts are likely to improve our understanding of the interactions between the harvest of groundfish and salmon. NMFS is conducting or participating in several research projects to improve understanding of the ecosystems, fisheries interactions, and gear modifications to reduce salmon PSC.

Ecosystem management, rationalization, and traditional management tools are likely to improve the protection and management of target and prohibited species, including targets of the non-pollock trawl fleet and Chinook salmon, and are not likely to result in significant effects when combined with the direct and indirect effects of the PA.

Ecosystem management, rationalization, and traditional management tools are likely to increase protection to non-specified and forage species, marine mammals, seabirds, habitat, and the ecosystem by considering these species more in management decisions, and by improving the management of the non-pollock trawl fisheries through the restructured Observer Program, catch accounting, seabird avoidance measures, and vessel monitoring systems (VMS). Any change in protection measures for marine mammals likely would have insignificant effects because any changes would be unlikely to result in the PBR being exceeded and would not be likely to jeopardize the continued existence or adversely modify or destroy designated critical habitat. Additionally, since future TACs will be set with existing or enhanced protection measures, we expect that the effects of the fishery on the harvest of prey species and disturbance will not increase in future years. Any action by other entities that may impact marine mammals and seabirds will likely be offset by additional protective measures for the federal fisheries to ensure ESA-listed mammals and seabirds are not likely to experience jeopardy or adverse modification of critical habitat. Direct mortality by subsistence harvest is likely to continue, but these harvests are tracked and considered in the assessment of marine mammals and seabirds. Continued fishing under the harvest specifications is likely the most important cumulative effect on EFH, but the EFH EIS (NMFS 2005) has determined that this effect is minimal. The Council is also considering improving the management of non-specified species incidental takes in the fisheries to provide more protection to this component of the ecosystem. Any shift of fishing activities from federal waters into state waters would likely result in a reduction in potential impacts to EFH because state regulations prohibit the use of trawl gear in much of state waters.

Considering the direct and indirect impacts of the PA, when added to the impacts of past and present actions previously analyzed in other documents (referenced) and the impacts of the reasonably foreseeable future actions listed above, the cumulative impacts of the proposed action are determined to be not significant.

4 Regulatory Impact Review

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 order:

“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.

4.1 Statutory authority

Under the Magnuson-Stevens Act (16 USC 1801, et seq.), the United States has exclusive fishery management authority over all marine fishery resources found within the 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 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.

Gulf of Alaska groundfish fisheries in the EEZ off Alaska are managed under the FMP for Groundfish of the Gulf of Alaska. The Chinook salmon prohibited species catch management measures 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.

4.2 Gulf of Alaska trawl fisheries

The groundfish trawl fisheries in the Gulf of Alaska's Central and Western regulatory areas are comprised of directed fisheries for pollock, Pacific cod, rockfish, and flatfish species. GOA trawl fisheries open on January 20 and close on December 31, unless NMFS intervenes with a closure to prevent the exceeding of annual TAC or established PSC limits for Pacific halibut (or Chinook salmon in the GOA pollock trawl fishery). Regulations prescribe seasons for pollock, Pacific cod and rockfish within the fishing year (50 C.F.R. 679.23). In the absence of management closures, directed pollock fishing is permitted in A and B seasons from January 20 to May 31 and in C and D seasons from August 25 to November 1. Likewise, directed Pacific cod fishing is permitted in the A season from January 20 to June 10 and the B season from September 1 to November 1. In the Central GOA, directed rockfish fishing is permitted from May 1 to December 31. In the Western GOA, directed rockfish fishing is permitted beginning on July 1. Directed flatfish fishing is permitted in either regulatory area from January 20 to December 31.

While regulatory fishing seasons define beginning and end points for GOA trawl activity, the pattern of fishing behavior in a given year is complex and largely driven by participants' ability to be active in multiple fisheries. Beyond season dates established in regulation, the factors that influence intra-annual behavior include relative value of various target species, seasonal fish stock abundance, and interacting directed fishing closures due to species TAC limits and seasonal or annual PSC limits.

GOA trawl fisheries are currently subject to PSC limits on Pacific halibut (GOA Groundfish FMP Amendment 18, modified by Amendment 95) and Chinook salmon in the pollock fishery (Amendment 93).⁷ Chinook salmon PSC in the pollock trawl fishery is capped annually and apportioned by regulatory area. Halibut trawl PSC limits are apportioned seasonally by directed species complex (deep-water and shallow-water).⁸ Section 4.4.8.2 of the RIR prepared for the Council's consideration of its preferred alternative describes the current management of halibut PSC in the GOA non-pollock trawl fishery (NPFMC 2013, p.116). The directed fishery for rockfish is constrained by the halibut PSC limit apportioned to the deep-water complex. Vessels fishing in the Rockfish Program are typically exempt from seasonal halibut PSC closures, as they fish from their own halibut PSC apportionment that is deducted from the third season allowance (July 1 through September 1). However, RP vessels sometimes experience special sideboard closures for fisheries other than rockfish while the Rockfish Program fishery is still open; RP CVs experienced such sideboard closures in July of 2007 and 2011.

4.2.1 Fishing effort in the GOA groundfish trawl catcher vessel fleet

4.2.1.1 Participation

Since 2007, the number of active CVs in the GOA non-pollock trawl fishery has ranged between 52 and 65 vessels (Table 4-1). CVs follow different patterns of participation throughout the calendar year. Some vessels may fish primarily for Pacific cod (and pollock) in the early and late seasons, while others fish closer to year-round, targeting flatfish in late-spring and early-fall. The majority of CVs target rockfish in the early summer months (May through July), with levels of rockfish participation varying later in the summer and fall as the seasonally restricted cod and pollock fisheries reopen.⁹ Just as levels of participation in the different target fisheries varies by vessel, so does the proportion of annual groundfish revenue derived from each target fishery and in each period of the year. In aggregate, CVs active in the GOA trawl fishery earn the majority of their total annual revenue from GOA groundfish (including

⁷ The Chinook salmon PSC limit in the pollock fishery went into effect during the C-season of the 2012 fishing year.

⁸ Of the directed fisheries considered in this analysis, the deep-water complex includes rockfish, arrowtooth flounder and rex sole; the shallow-water complex includes Pacific cod, flathead sole and shallow water flatfish.

⁹ Target harvest by month is illustrated in Tables 4-29 and 4-30 of the original RIR (NPFMC 2013, p.116).

pollock), as opposed to revenues generated in the BSAI groundfish fisheries and other sources of income.¹⁰

Table 4-1 Number of catcher vessels making landings in the GOA non-pollock trawl fishery, number making landings under the Rockfish (Pilot) Program

	Total CVs	RP CVs
2007	63	25
2008	65	25
2009	59	24
2010	52	24
2011	53	23
2012	62	28

Participation throughout the year is roughly illustrated in the original RIR (NPFMC 2013, Table 4-1, p.87). Depending on the year, around 30% to 50% of active CVs fished only in the first calendar quarter (January through March), mainly targeting cod.¹¹ A similar proportion of the CV fleet fished throughout the year; they target rockfish in the summer, rockfish and cod in the early fall, and primarily targeting flatfish towards the end of the year. Barring a change in individual business planning, these year-round vessels would be the most likely to be impacted by the action under consideration.

Many participants in GOA trawl fisheries are members of cooperative programs, including the Central GOA Rockfish Program and the Bering Sea pollock cooperative program (American Fisheries Act). Sixty-two CVs were active during the 2012 fishing year. Thirty-five of those vessels were members of a Central GOA Rockfish Program cooperative, though only 28 actually made Rockfish Program landings (Table 4-1). Eighteen active CVs, all of them Rockfish Program participants, were also part of the AFA pollock fleet; only five of these vessels were licensed to an Alaska mailing address. Overall, 12 of the 36 CVs that fished under a cooperative management fishery in 2012 were licensed at an Alaska address. Twenty-six GOA CVs were not part of any cooperative management program, and 13 of those vessels were Alaska-owned.

4.2.1.2 Groundfish harvest

In the years since implementing the Rockfish Pilot Program, trips targeting rockfish species have accounted for around 8,700 mt of harvest per year. Among the GOA non-pollock target fisheries, harvest on rockfish trips typically produced the second or third highest target harvest by weight (Table 4-2). The other predominant targets were Pacific cod, and the arrowtooth flounder and rex sole fishery. Arrowtooth flounder and rex sole are considered jointly, as they are typically targeted together and trip target designation is assigned after the fact.

¹⁰ See NPFMC 2013, Table 4-2, p.88.

¹¹ Participation in the directed pollock fishery is not directly considered in this analysis.

Table 4-2 GOA catcher vessel groundfish harvest (mt) by target and by area, 2007 to 2012

Area	Target Species	2007	2008	2009	2010	2011	2012	Average
CG	Arrowtooth Fl. & Rex Sole	11,261	14,617	13,839	12,751	17,056	9,532	13,176
	Pacific Cod	7,857	12,463	5,638	14,688	9,469	12,506	10,437
	Rockfish	8,661	7,919	8,080	9,358	7,933	10,528	8,747
	Shallow Water Flatfish	9,995	10,622	11,995	6,684	2,919	4,033	7,708
	Flathead Sole & DWF *	88	583	373	1,043	402	313	467
	Sablefish & Other Species *	300	324	355	170	253	238	273
CG Total		38,163	46,528	40,280	44,694	38,031	37,150	40,808
WG Total **		4,316	4,685	1,804	1,833	2,099	5,812	3,425
GOA Total		42,478	51,213	42,085	46,528	40,129	42,962	44,232

* Target species considered jointly to preserve confidentiality

** The vast majority of on-pollock harvest in the Western GOA occurs on trips targeting Pacific cod. Some trips targeted rockfish species (2007 and 2008) and arrowtooth flounder (2012). Trip target harvest is not broken out, in order to present the area total while preserving confidentiality.

Source: NMFS Alaska Region Catch Accounting System, data compiled by AKFIN in Comprehensive_BLEND_CA

While CV revenue is typically measured in ex-vessel terms, the RIR that informed the Council's deliberations on the existing preferred alternative included both CV and CP data, thus wholesale revenue was chosen as a better means of comparison (NPFMC 2013). Revenue data, by regulatory area and by target species, is presented here in terms of gross first wholesale in order to maintain consistency (Table 4-3). Table 4-3 indicates that Pacific cod has accounted for the greatest proportion of non-pollock groundfish revenue. The Pacific cod and rockfish target fisheries are also the most valuable non-pollock fisheries on a per metric ton basis. Section 4.4.6.3 in the original RIR (NPFMC 2013, p.104) describes the strong correlation between groundfish harvest and revenue, concluding that years of relatively low target species harvest are not compensated by a higher wholesale value per metric ton. This suggests that any potential forgone harvest identified in the impact analysis should be expected to result in a loss of revenue from the fishery.

Table 4-3 GOA catcher vessel groundfish gross first wholesale revenue (\$1,000) by target and by area, 2007 to 2011

Area	Target Species	2007	2008	2009	2010	2011	2012	Average
CG	Arrowtooth Fl. & Rex Sole	9,675	12,062	9,891	8,515	14,335	9,436	10,652
	Pacific Cod	13,673	22,619	7,503	19,388	14,425	17,554	15,860
	Rockfish	13,093	10,873	9,663	12,901	16,136	20,322	13,831
	Shallow Water Flatfish	9,981	10,357	9,354	4,935	2,546	4,150	6,887
	Flathead Sole & DWF *	93	565	307	814	406	375	427
	Sablefish & Other Species *	1,899	2,015	2,082	1,294	2,153	1,687	1,855
CG Total		48,413	58,491	38,800	47,847	50,001	53,525	49,513
WG Total **		8,550	9,417	2,484	2,413	3,209	8,290	5,727
GOA Total		56,963	67,908	41,284	50,260	53,210	61,815	55,240

* Target species considered jointly to preserve confidentiality

** The vast majority of on-pollock harvest in the Western GOA occurs on trips targeting Pacific cod. Some trips targeted rockfish species (2007 and 2008) and arrowtooth flounder (2012). Trip target harvest is not broken out, in order to present the area total while preserving confidentiality.

Source: ADFG Commercial Operators Annual Report, data compiled by AKFIN in Comprehensive_ENCOAR_PROD

The vast majority of non-pollock CV trawl harvest is delivered to processors in Kodiak. From 2007 to 2011, the sector delivered 93% of groundfish catch (212,000 mt) to Kodiak; at wholesale, this product generated \$248 million in gross revenue, accounting for 90% of the GOA non-pollock wholesale

revenues generated from CV harvest (see NPFMC 2013, Table 4-10, p.93). Other GOA communities that processed CV groundfish include Akutan, Dutch Harbor/Unalaska, King Cove, Sand Point, and Seward.

4.2.1.3 Chinook salmon Prohibited Species Catch

The original RIR documents that there has been little correlation between GOA non-pollock groundfish trawl harvest and levels of Chinook salmon PSC (NPFMC 2013, Section 4.4.9.2, p.119). From 2007 to 2012, the CV sector accounted for the slight majority of average annual Chinook salmon PSC, though the CP sector recorded higher PSC in three of the six reported years (Table 4-4). On a trip target level, arrowtooth flounder and rex sole trips accounted for 37% of Chinook PSC in the CV sector, Rockfish trips accounted for 27%, shallow water flatfish trips accounted for 20%, and Pacific cod trips 17% over the same time period.

Table 4-4 Chinook salmon PSC in GOA non-pollock groundfish trawl fisheries, by operation type and Rockfish Program activity

	2007	2008	2009	2010	2011	2012	Average	%
CPs (all)	2,975	2,651	2,282	4,631	2,986	1,890	2,903	49%
CVs (all)	2,352	2,506	2,793	5,117	3,917	1,774	3,076	51%
<i>Non-Rockfish Program CVs</i>	1,869	857	2,019	4,152	3,549	957	2,234	37%
<i>Rockfish Program CVs</i>	483	1,649	773	965	368	817	843	14%
Total	5,327	5,157	5,075	9,747	6,902	3,665	5,979	

Source: NMFS Alaska Region Catch Accounting System, data compiled by AKFIN in Comprehensive_PSC.

At a seasonal level, CV Chinook salmon encounter in the GOA non-pollock trawl fishery is greatest from the late spring through the early summer, and peaks again in the fall (Table 4-5). From 2007 to 2012, Arrowtooth flounder and rex sole trips make up 99% of the Chinook PSC taken in April. CVs fishing under the Rockfish Program and targeting rockfish species account for 80% of the Chinook PSC taken in May and June over the same set of years. Of the Chinook on non-RP trips during these months, 70% are caught in on trips targeting arrowtooth flounder, with most of the remainder taken on shallow water flatfish trips; non-RP trips were credited with a negligible amount of Chinook PSC in the month of June. Non-RP trips account for 96% of the Chinook PSC taken during September and October; the September Chinook PSC occurred primarily on trips targeting Pacific cod (B season), while October PSC occurred mostly in flatfish fishery (56% shallow water flatfish, 27% arrowtooth flounder) and on trips targeting Pacific cod (17%). Roughly half of the Chinook salmon encountered on Rockfish Program trips during September occurred on trips that were classified in Catch Accounting after the fact as having targeted Pacific cod, with the remained taken on trips targeting rockfish.

Table 4-5 Average monthly Chinook salmon PSC in the CV sector, 2007 through 2012

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Non-RP CV	64	82	112	672	178	0	6	26	202	784	78	29
RP CV					485	265	40	6	44	< 1	3	
Total	64	82	112	672	663	265	46	32	246	784	81	29

Source: NMFS Alaska Region Catch Accounting System, data compiled by AKFIN in Comprehensive_PSC.

The original RIR reports extensively on Chinook salmon PSC rates in the GOA non-pollock trawl fishery, by operation type, by year, by month, and by Rockfish Program affiliation (NPFMC 2013, Section 4.4.1.1, p.133). PSC rates reflect the number of Chinook salmon caught per metric ton of non-pollock groundfish trawl harvest.¹² While not necessarily indicative of total Chinook salmon PSC, a rate provides a measure of bycatch frequency or intensity for a harvest sector or time period. As noted in the previous analysis, the high degree of annual variability should serve to caution against expecting future rates to conform to recent trends.

Table 4-6 displays annual Chinook salmon PSC rates by harvest sector and area. The gulf-wide CV rate of 0.07 indicates that CVs encountered roughly one Chinook salmon for every 14 mt of non-pollock groundfish harvest. The PSC rate for CVs was significantly lower in the Western GOA, compared to the Central GOA during the reported years. Table 4-7 reports average PSC rates by month, for the 2007 to 2012 period. PSC rates in the CV sector were above the annual CV average during May and June, when the majority of the sector's rockfish activity takes place. These rates may be upwardly influenced by higher Chinook PSC years at the beginning of the Rockfish Pilot Program in 2007 and 2008, when Rockfish cooperatives were prioritizing halibut PSC avoidance. Chinook PSC rates are considerably lower in July, when the CV sector takes around 17% of its annual rockfish trip harvest. The CV sector's PSC rate tends to spike again in October, at which point both harvest and PSC are predominantly occurring in the shallow water flatfish, Pacific cod, and arrowtooth flounder/rex sole fisheries.

Table 4-6 Chinook salmon PSC rates by GOA non-pollock groundfish trawl sector, 2007 to 2012¹³

	2007	2008	2009	2010	2011	2012	Average
Total GOA	0.08	0.07	0.08	0.14	0.10	0.05	0.09
GOA CP	0.14	0.12	0.10	0.20	0.11	0.07	0.12
GOA CV	0.06	0.05	0.07	0.11	0.09	0.04	0.07
CGOA CP	0.24	0.19	0.17	0.22	0.12	0.08	0.17
CGOA CV	0.06	0.05	0.07	0.11	0.09	0.05	0.07
WGOA CP	0.03	0.02	0.01	0.16	0.07	0.07	0.06
WGOA CV	0.00	0.02	0.01	0.00	0.05	0.00	0.01

Source: NMFS Alaska Region Catch Accounting System, data compiled by AKFIN in Comprehensive_PSC and NMFS Alaska Region Catch Accounting System, data compiled by AKFIN in Comprehensive_BLEND_CA.

Table 4-7 Chinook salmon PSC rates by month, 2007 to 2012

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	12 mo. Average
Catcher Vessels	0.02	0.01	0.04	0.10	0.14	0.08	0.02	0.01	0.05	0.17	0.06	0.13	0.07
CGOA CVs	0.02	0.02	0.04	0.10	0.14	0.08	*	0.01	0.05	*	0.06	0.13	0.07
WGOA CVs	0.01	0.01	0.02				*			0.02			0.00
Total GOA	0.02	0.03	0.08	0.21	0.14	0.12	0.03	0.02	0.07	0.14	0.09	0.22	0.10

Notes: * indicates confidential data; "Total" includes both CV and CP records.

¹² For this analysis, PSC rates are calculated in a manner that weights the relevant week-ending date (WED) records by the amount of fishing activity that took place. For example, when calculating the PSC rate for a given harvest sector, the sum of Chinook salmon PSC for all WED records in that sector is divided by the sum of all groundfish harvest (mt) in the same WED records. This method is preferable to averaging the Chinook PSC/mt ratios for the set of records. Doing so would effectively weight each WED record equally, potentially allowing records that account for a small amount of the sector's total fishing activity to bias the sector's overall PSC rate.

¹³ Comparing the Chinook salmon PSC rates of GOA CPs and CVs presents an analytical challenge in two key respects. First, the CP and CV harvest sectors experience different levels of observer coverage. Second, the two sectors prosecute the GOA groundfish fisheries for different primary targets, at different times and in different locations. This is discussed in greater detail in the original RIR (NPFMC 2013, pp.137-138).

4.2.2 Central Gulf of Alaska Rockfish Program

The Rockfish Pilot Program (RPP) was established through Amendment 68 to the Gulf of Alaska FMP. In its purpose and need statement, the Council identified fishery participants' limited ability to minimize bycatch under the existing limited entry management structure. The RPP, replaced by the Rockfish Program in 2011, established a cooperative management structure in which members can coordinate and distribute fishing activity over a greater portion of the year. Additional background information is included in the original RIR (NPFMC 2013, Section 4.4.10, p.130).

Central GOA rockfish trawlers made several behavioral changes that may be causally linked to a trend in Chinook salmon PSC. Implementation of the RPP in 2007 increased the length of the rockfish trawl season, increased the gross weight delivered to processors during May and June, and helped drive a shift from non-pelagic to semi-pelagic trawl gear (Figure 4-1). Beginning the CV rockfish season earlier helped to accomplish several management goals: stabilizing residential processor work force opportunities in Kodiak (May and June had previously been a period of low worker utilization); allowing AFA participants to fish earlier in the Bering Sea, when BS salmon encounter was lower; and improving product value by having fresh, well-handled rockfish product available for a greater portion of the year.

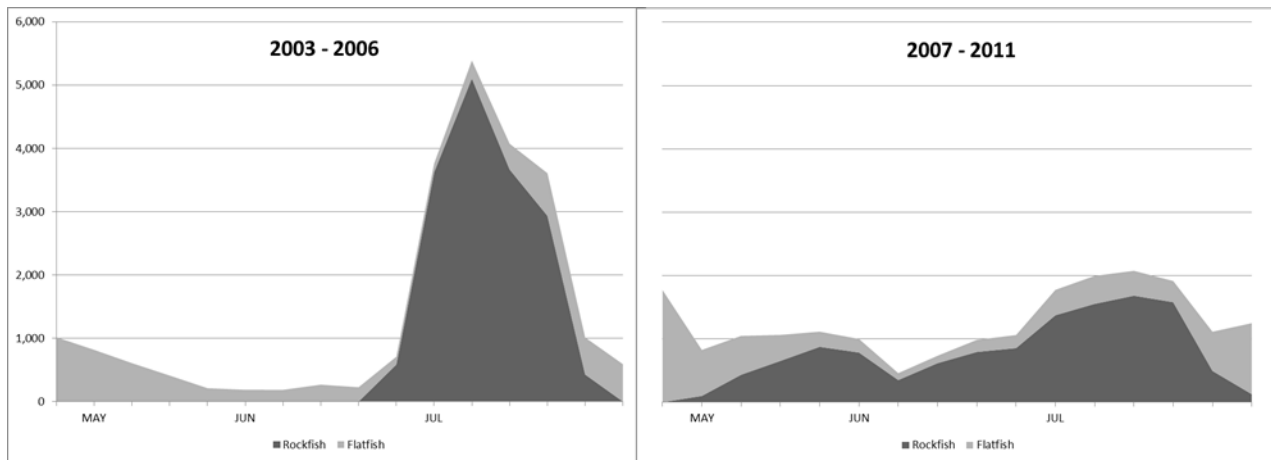


Figure 4-1 Seasonal distribution of harvest (mt) on trips targeting rockfish and flatfish, before and after implementation of the Rockfish Pilot Program in 2007

Under existing regulations, vessels participating in the Rockfish Program are primarily constrained by halibut PSC. CVs and CPs operating under RP cooperatives share a halibut PSC allocation of 191.4 mt, which is taken from the third halibut trawl halibut PSC season (July 1 through September 1). This allocation to RP participants is available for use between May 1 and November 15. By regulation, 55% of the unused amount of halibut PSC is added to the fifth halibut PSC season limit, which begins on October 1. The remaining 45% of the unused RP halibut PSC allocation is not available for use by any sector, and is effectively retired. The size of the fifth season halibut PSC limit is not specified at the beginning of the fishing year; the halibut PSC available in the fifth season is not apportioned between the deep-water complex (which includes rockfish) and the shallow-water complex. The target species included in each complex are listed in Footnote 8.

4.2.2.1 Participation

Ninety-three unique CVs participated in the GOA groundfish fisheries between 2007 and 2012. Eight-four participated in the non-pollock fisheries during that period, while nine fished only for pollock. Twenty-one vessels made landings in the Rockfish Program in each analyzed year; one additional vessel participated in the RP for the only year that it trawled in the GOA (2012). Ten vessels spent some years in

the RP, some in the non-RP fishery, and other years inactive. Sixty-one vessels made a GOA groundfish landing at some point since 2007, but never fished in the Rockfish Program.

Table 4-1 lists the number of CVs that made landings under the Rockfish Program in each year, from 2007 to 2012. Thirty-three unique CVs have made RP landings since the Pilot Program was implemented in 2007. Nine CVs that participated in the RP in at least one year also spent one or more years active in the GOA during which they did not make co-op landings. Twenty-eight CVs made RP landings in 2012, and no fewer than 23 have been active in any one year. The number of vessels that appear in catch accounting reports does not give the full number of enrolled vessels. For example, 35 vessels were listed on CV Rockfish Program cooperative rosters in 2012, and 43 are listed as members of seven CV cooperatives in 2013.¹⁴ The quota that was allocated to inactive vessels is typically fished on other vessels within the cooperative. There are currently two RP cooperatives for CPs, with a total of 10 enrolled vessels; CP sector participation is not further analyzed in this document.

In 2013, 17 of the 43 cooperative-member CVs held endorsements for the AFA pollock fishery in the Bering Sea. Twenty-three GOA CVs endorsed to trawl in the Central or Western GOA held AFA endorsements, but were not enrolled in RP cooperatives. In addition to AFA membership, Table 4-8 shows the other trawl and non-trawl endorsements held on vessels in the GOA CV fleet. Not surprisingly, all 46 vessels¹⁵ eligible for the Rockfish Program are endorsed to trawl in the Central GOA. The table shows that not all RP eligible vessels can trawl in the Bering Sea. The 20 Bering Sea trawl endorsements held by RP eligible vessels include the 17 AFA members, and three that are endorsed for Bering Sea non-pollock activity. GOA trawl-endorsed vessels that cannot participate in the Rockfish Program generally have access to a greater variety of other fisheries; most notable among these are the Western GOA Pacific cod pot fishery, and the BSAI trawl fisheries.

Table 4-8 Other endorsements held by GOA catcher vessels, by Rockfish Program eligibility, 2013

	Rockfish Program	Non-Rockfish Program
CGOA Trawl	46	71
WGOA Trawl	17	81
CG CV PCOD HAL	0	2
CG CV PCOD POT	3	4
CG CV PCOD JIG	0	0
WG CP PCOD POT	0	1
WG CV PCOD HAL	0	0
WG CV PCOD POT	0	31
WG CV PCOD JIG	0	1
AI Trawl	0	30
BS Trawl	20	54
AI CV PCOD HAL	0	1
AI CV PCOD POT	0	0
BS CV PCOD HAL	0	0
BS CV PCOD POT	0	1

"HAL" = hook-and-line
Source: RAM LLP file

¹⁴ Co-op rosters and annual reports are available at <http://alaskafisheries.noaa.gov/ram/daily/rockfishllp.pdf>, and <http://alaskafisheries.noaa.gov/sustainablefisheries/rockfish/>.

¹⁵ Noting that only 43 vessels are listed on 2013 Rockfish Program cooperative rosters, it is apparent that several vessels declined to join a cooperative. This could be a decision not to fall under Rockfish Program sideboards.

4.2.2.2 Groundfish Harvest

From 2007 to 2012, the CV fleet accounted for roughly two-thirds of total GOA non-pollock trawl harvest, and 73% of Central GOA non-pollock harvest. The Rockfish Program, overall, recorded an average annual harvest of around 13,800 mt of groundfish per year, which is about 20% of total GOA non-pollock harvest. Rockfish Program CVs accounted for 67% of total catch within the Program, averaging 9,201 mt per year (Table 4-9). The balance of Program harvest is taken by CPs, of which there have been far fewer participating vessels. The RP CV's share of total RP harvest was closer to 80% from 2007 to 2009, and has ranged between 57% and 61% in the three most recent years for which data are available.

Rockfish Program CVs account for about 21% of the CV sector's average annual groundfish harvest (44,665 mt). This proportion has been consistent since 2007, with a spike up to 28% in 2012. Looking only at Central GOA CV activity, Rockfish Program CVs account for 22% of annual CV groundfish harvest; that proportion also jumped from the 20% to 21% level to 32% in 2012.

Table 4-9 Groundfish harvest (mt) recorded on Rockfish (Pilot) Program CV trips, 2007 to 2012

2007	2008	2009	2010	2011	2012	Average
8,268	8,774	8,132	9,602	8,472	11,959	9,201

Source: NMFS Alaska Region Catch Accounting System, data compiled by AKFIN in Comprehensive_BLEND_CA.

The Rockfish Program – both CVs and CPs – accounts for almost 60% of total GOA non-pollock harvest in May, and over 80% in June. The CV sector is responsible for all RP harvest in May, and over 80% in June. Within the CV sector, Rockfish Program activity accounts for the majority of groundfish harvest between May and July, then falls off precipitously in mid-August as effort switches to pollock, Pacific cod, and flatfish (Table 4-10).

Table 4-10 Proportion of CV non-pollock groundfish harvest occurring under the Rockfish Program, by month, 2007 to 2012

	MAY	JUN	JUL	AUG	SEP	OCT	NOV
RP CVs	66%	82%	49%	21%	17%	10%	21%
Non-RP CVs	34%	18%	51%	79%	83%	90%	79%

Source: NMFS Alaska Region Catch Accounting System, data compiled by AKFIN in Comprehensive_BLEND_CA.

From 2007 to 2012, 98% of the catch taken on Rockfish Program trips was delivered to Kodiak. This catch also accounted for 98% of the gross first wholesale value derived from RP harvest. Annual data cannot be presented due to confidentiality restrictions, as small amounts were delivered to three other communities during some years. The other communities receiving RP deliveries to shore-based processors during this period were Sand Point, Akutan and Seward.

4.2.2.3 Chinook salmon Prohibited Species Catch

Since the implementation of the Rockfish Pilot Program in 2007, the Program's CV sector has taken an average of 843 Chinook salmon PSC per year (Table 4-4). This amounts to 14% of all GOA non-pollock trawl Chinook PSC, and 27% of Chinook PSC encountered in the CV fisheries. The annual PSC data displayed in Table 4-4 reflect a gradual reduction in Chinook encounter in the RP CV sector after several years of experience under the Program. Several factors may have contributed to lower PSC levels in the sector: realization of the apparent trade-off between halibut and Chinook salmon encounter; heightened awareness and prioritization of Chinook PSC avoidance; and more experience in managing fishing effort within a cooperative model. However, speculating on the cause of past trends is beyond the scope of this

analysis, and six years is a relatively short sample of history for establishing any sort of trend in a fishing outcome – Chinook PSC – that has proven both variable and unpredictable.

Table 4-5 provides an important basis for understanding the approximate monthly and seasonal demand for Chinook salmon PSC in the RP CV sector. Again, the analyst cautions that this historical data does not constitute a precise prediction of future levels. Aside from the obvious peak of Chinook PSC demand during May and June, also note that the RP CV sector has historically recorded very low levels of Chinook PSC after September; this late-year period captures the potential “rollover” dates that are analyzed in this document for shifting unused RP PSC allowances into the non-Rockfish Program CV fisheries.

Table 4-11 summarizes annual Chinook salmon PSC rates, breaking out trips taken under Rockfish Program cooperatives. This table includes data from all trip targets, and it should be noted that the non-Rockfish Program PSC rates are calculated from a larger sample of records and more metric tons of groundfish harvest. Annual RP PSC rates have substantially declined in the most recent analyzed years. Table 4-12 and Table 4-13 break out PSC rates for Rockfish Program and non-Rockfish Program activity on a monthly basis. Monthly PSC rates for the non-Rockfish Program trips tend to be higher in April, May, and in the fall when flatfish fishing predominates (Table 4-13).

Table 4-11 Chinook salmon PSC rate by Rockfish (Pilot) Program activity, 2007 to 2012

	Rockfish Program	2007	2008	2009	2010	2011	2012	Average
CV	N	0.05	0.02	0.06	0.11	0.10	0.03	0.06
	Y	0.06	0.19	0.10	0.10	0.04	0.07	0.09
Total GOA (CV+CP)	N	0.06	0.05	0.07	0.16	0.11	0.05	0.09
	Y	0.19	0.18	0.10	0.08	0.05	0.06	0.11

Source: NMFS Alaska Region Catch Accounting System, data compiled by AKFIN in Comprehensive_PSC and NMFS Alaska Region Catch Accounting System, data compiled by AKFIN in Comprehensive_BLEND_CA.
Note: Rockfish Program (Y, N) reflects whether or not the trip, as recorded in NMFS Catch Accounting System, was flagged as taking place under a RP cooperative; it is not a reflection of all the annual fishing by vessels that are enrolled in a cooperative.

Table 4-12 Chinook salmon PSC rates on Rockfish (Pilot) Program trips, by month, 2007 to 2012

	MAY	JUN	JUL	AUG	SEP	OCT	NOV	7 mo. Average
RP Catcher Vessel Trips	0.16	0.10	0.03	0.01	0.06	0.00	0.01	0.05
All GOA RP Trips	0.16	0.14	0.07	0.03	0.10	0.00	0.01	0.07

Table 4-13 Chinook salmon PSC rates on non-Rockfish Program trips, by month, 2007 to 2012

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	12 mo. Average
Non-RP Catcher Vessels	0.02	0.01	0.04	0.10	0.11	0.00	0.00	0.01	0.05	0.19	0.07	0.13	0.06
CGOA CVs	0.02	0.02	0.04	0.10	0.11	0.00	*	0.01	0.05	*	0.07	0.13	0.06
WGOA CVs	0.01	0.01	0.02				*			0.02			0.00
Total GOA Non-RP	0.02	0.03	0.08	0.21	0.12	0.01	0.02	0.02	0.07	0.15	0.10	0.22	0.09

Notes: * indicates confidential data; “Total” includes both CV and CP records.

4.2.3 Seasonality of Rockfish Program and Non-Rockfish Program activity

The action alternatives considered in this document could affect the amount of Chinook salmon PSC available to sectors of the GOA CV fleet at different times of the year. As such, analyzing the alternatives requires an understanding of what activity (participation, harvest, and PSC) historically occurs before and

after key dates in the calendar year, particularly towards the end of the year when potential Chinook PSC rollover dates are proposed. Similar to the previous RIR (NPFMC 2013), the analyst acknowledges that historical behavior and outcomes are not perfect predictors of the future, and participants are likely to alter their behavior in response to the way that Council action shapes their private incentives. Also, as noted above, the number of participants in the Rockfish Program and non-Rockfish Program CV sectors is likely to change from year to year. Moreover, recent historical data reflects increased participation patterns in GOA trawl fisheries, at least partly motivated by other future actions that the Council is considering.

Thirty-three CVs never landed non-pollock groundfish species on or after October 1; only one of those vessels ever participated in the Rockfish Program, and that vessel did so in only one year. Of those 33, 19 fished in the fall, but only for pollock, and 14 made no landings of any type in the late-year months. By contrast, most CVs that participate in the Rockfish Program were active in the fall fisheries. Table 4-14 shows the total number of vessels that made RP landings in each year, the number of those same vessels that continued fishing past September, and the number of vessels that made landings in each GOA non-pollock target fisheries. Note the annual variability in the key fall Pacific cod fishery. Years with low active vessel counts are the result of TAC closures that occurred in September or early October. For example, in 2010 the Inshore sector of the Central GOA Pacific cod fishery closed on September 13, and the Inshore sector of the Western GOA closed on October 13; it is not surprising to find that RP CVs had low participation in the Western GOA regulatory area. Excluding pollock, shallow water flatfish accounted for the most harvest weight for the RP CVs on or after October 1, averaging 1,900 mt over the 2007 to 2012 period. The arrowtooth flounder and rex sole fishery brought in the second most (1,330 mt per year), followed by Pacific cod (850 mt), and rockfish species (650 mt).

Table 4-14 Rockfish Program-affiliated CV participation in GOA non-pollock fisheries, on or after October 1

Year	Total # Active RP Catcher Vessels	# RP CVs Active Oct. 1 or After	# Vessels Active On/After Oct. 1 -- Target Fishery					
			Rockfish	Pacific Cod	Arrowtooth/Rex	Shallow Water Flatfish	Flathead Sole	Sablefish & Other
2007	25	20	9	6	5	15		
2008	25	24	4	20	5	17	2	2
2009	24	21	6	3	7	19	3	1
2010	24	18	7		10	11		2
2011	23	22	4	18	8	4	1	1
2012	28	25	4	13	9	18		

Source: NMFS Alaska Region Catch Accounting System, data compiled by AKFIN in Comprehensive_BLEND_CA.

No vessels were identified that harvested groundfish *only* after October 1. On a number of occasions, a vessel might land the majority of its catch in a certain target fishery after that date – usually shallow water flatfish, but occasionally arrowtooth flounder or even rockfish. Vessels that displayed this harvest pattern only did so in a minority of the years that they were active, and were more likely to have participated in the Rockfish Program in those years.

The RP CV sector makes around 85% of its non-pollock landings prior to October 1. From 2007 to 2012, the last RP landing of the year has occurred in mid-November. RP trips brought in an average of 800 mt of groundfish harvest per year between October 1 and mid-November. This amount ranged between roughly 300 mt and 1,800 mt in different years; the highest value was an outlier, and the six-year median post-September catch was closer to 650 mt. Groundfish harvest for the sector was greater in November than in October for only one year. RP CV Chinook PSC encounter has been very low during this part of the year (Table 4-5).

Chinook salmon PSC taken on RP trips occurred almost entirely in the months prior to October 1. In the non-RP CV sector, average annual PSC before October 1 was 1,343 Chinook salmon. After September,

the non-RP CV sector averaged 891 Chinook. It should be noted that there was substantial annual variation around these period averages.

From 2007 to 2011, no more than 15% of all GOA CV gross first wholesale revenue was generated from harvest, including pollock, taken after October 1. Looking only at non-pollock activity during that time period, the Rockfish Program CV sector generated between 10% and 15% of its revenues during the late-year months. The non-RP non-pollock sector displayed more variation in its post-September revenues from year to year, likely due to dependency upon pollock among those vessels. In two years, post-September non-pollock revenues accounted for less than 10% of total non-RP CV revenues. Relative dependence on the revenue generated from late-year trawl activity does not appear to differ by whether the CV's LLP was registered at an Alaskan or a non-Alaskan address.

The vast majority of CV harvest that occurred after July was delivered to shoreside processors in Kodiak, including all harvest in the RP CV sector. The non-RP CV sector delivered very small amounts of catch taken on October trips targeting Pacific cod to Sand Point and Seward; each community received October non-pollock deliveries in only one of the analyzed years. The catch delivered to Sand Point was taken in the Western GOA, and the catch delivered to Seward was taken in the Central GOA. Further details cannot be provided due to confidentiality restrictions.

4.3 Effects of the alternatives

The following sections analyze the potential effects of the no action and action alternatives, with the no action alternative ("status quo") being the implementation of the Council's preferred alternative as expressed in its June 2013 motion. Any of the alternatives could directly affect the amount of Chinook salmon PSC that is available to the GOA non-pollock trawl CV fleet at a given point during the year. The analysis focuses on whether, and to what extent, the considered alternatives increase the likelihood of non-pollock trawl fisheries closing as a result of Chinook PSC limits being reached. The direct impact of any potential closure is roughly measured in terms of when the fishery might close, and how much groundfish is typically harvested by the sector after that point in the season. As before, analysis of potential closures is based on historical PSC data, which varies from year to year without a discernible trend. This analysis reports impacts as they would have occurred had the considered alternatives been in place, but does not forecast future levels of Chinook salmon PSC.

Downstream effects, which are no less important, include potential changes in the amount of product delivered to shore-based plants at certain times in the year, changes to employment opportunities at fishery-supporting businesses in GOA port communities, and state and municipal tax revenues. These impacts are treated qualitatively, and have been presented in greater detail in the original RIR (NPFMC 2013, Section 4.7).

The considered alternatives would not, under any circumstances, increase the total number of Chinook salmon that are allowed to be taken by the non-pollock CV sector in a given year, relative to the levels already analyzed in the original RIR. As a result, impacts on non-trawl stakeholders in the Chinook salmon resource are not discussed.

4.3.1 Alternative 1: Status quo (Council's Preferred Alternative from June 2013)

Rockfish Program CV sector

Under the Council's preferred alternative, detailed in Section 2.1, the RP CV sector would be allowed up to 1,200 Chinook salmon PSC per year, for use between May 1 and November 15. Considering the

uncertainty pool mechanism, the RP CV sector could be allowed up to 1,360 Chinook salmon in a year if it has taken fewer than 1,040 Chinook in the preceding year (this progression is illustrated in Table 2-2).

Over the course of the Rockfish (Pilot) Program, the RP CV sector has taken more than 1,040 Chinook salmon only once, in 2008. The sector recorded 1,649 in that year of particularly high Chinook PSC, which upwardly influences the 2007 to 2012 annual average of 843 Chinook (Table 4-4). The median value was 795 Chinook per year. In a year when the RP CV sector encounters 795 Chinook, 405 allowable PSC would go unused. Using the sector's highest recorded level of Chinook PSC to gauge the maximum potential impact, the 2008 fishery would have been closed to RP CVs at the end of May. The remainder of the 2008 fishing year, from June to November 15, produced approximately 5,500 mt of groundfish harvest with a gross first wholesale value of \$9.2 million.¹⁶ Those revenues, constituting 64% of the sector's \$14.3 million in wholesale value for the year, would have been forgone. The RP CV sector's average annual gross first wholesale revenue was between \$14 and \$15 million per year, so it is not the case that taking more Chinook salmon produces greater harvest value. In fact, in May of 2008, when the sector encountered 1,187 Chinook salmon, the revenue generated was below the average monthly revenue for May. In short, the RP CV sector has little incentive to fish in a PSC-intensive manner, even if a PSC hard cap was not in effect. Choosing not to avoid Chinook salmon could result in cost savings, but it would not increase gross harvest revenue.

Non-Rockfish Program CV sector

If the Council chooses the no action alternative, the non-RP CV sector would be limited to 2,700 Chinook salmon PSC for the entirety of its GOA non-pollock trawl activity. The non-RP CV sector has, on average, taken 2,234 Chinook salmon per year since 2007 (Table 4-4), with a median value of 1,944 per year. The sector's Chinook encounter is concentrated from March to May, in the arrowtooth flounder and rex sole fishery, and in September and October, during the Pacific cod B season and the beginning of the fall shallow water flatfish fishery; historical PSC use from June through August has been very low (Table 4-5).

If future outcomes resemble the non-RP CV sector's experience from 2007 to 2012, fishery closures may occur in years of above average Chinook PSC encounter. The sector exceeded the 2,700 Chinook salmon PSC cap that would be imposed under the Council's PA in both 2010 and 2011. Closures would have occurred during those years at the beginning or the middle of October. Had the non-RP CV fishery closed in those years, the sector would have forgone between 4,500 mt and 7,700 mt of groundfish harvest, valued at \$3.1 million and \$9 million wholesale. The greatest observed impact would have resulted from the 2011 closure at the beginning of October, which affected 59% of Pacific cod B season production (4,300 mt, \$6 million wholesale). The 2010 closure would have caused far less forgone wholesale revenue because the Pacific cod B season finished in late-September of that year, though that is certainly not always the case. The timing of the cod fishery depends somewhat on the timing and location of GOA pollock fishing. The method utilized in the original RIR (NPFMC 2013) allows the analysis to move away from some of the year-to-year variation in the timing of harvest and PSC by comparing retrospectively simulated closure dates to the level and timing of fishing outcomes in a "typical" year for the sector. Applying that method here, the potential impact of the Council's PA in a high-Chinook PSC year would be on the order of 5,500 mt of forgone groundfish harvest, with a wholesale value loss of around \$5.6 million.

Under the uncertainty pool mechanism, the non-RP CV sector could qualify for an additional 360 Chinook salmon PSC if it recorded fewer than 2,340 Chinook in the preceding year. Expanding the

¹⁶ Using the "characteristic year" method, described in Section 4.7.1.2 of the original RIR (NPFMC 2013, p.170), forgone RP CV harvest from June through mid-November would equal roughly 5,700 mt of groundfish, valued at around \$10 million first wholesale.

allowable amount of PSC by 360 would not have kept the sector’s fall fisheries open for the entirety of its highest PSC years. However, if the sector were approaching its base apportionment of 2,700 Chinook around the beginning of September, the additional PSC would likely have forestalled closure by four to six weeks at the beginning of the valuable Pacific cod season. The sector’s typical weekly PSC during that time of the year is around 50 Chinook, and average weekly wholesale revenues are the relatively high – around \$1 million – when that season opens. In practice, it is difficult to predict the point during a calendar year at which the non-RP CV sector might tap into its uncertainty buffer, though it is not unlikely that sector members would cooperate to save the last of the remaining non-pollock PSC apportionment for the Pacific cod B season opener. If the sector made it through the Pacific cod B season on its base apportionment of PSC (2,700) but reached the limit in early or mid-October, the supplemental uncertainty buffer earned in the previous year would likely extend the fishing season by only two or three weeks, as average weekly PSC increases to around 150 Chinook salmon once shallow water flatfish activity predominates. Again, the timing of GOA fall fisheries is difficult to predict; in recent years, the starting date for the fall Pacific cod season has been affected by voluntary cooperative decisions to delay the start of the pollock C season in order to reduce Chinook PSC in that hard-capped fishery.

Table 4-15 shows the non-RP CV sector’s historical Chinook PSC usage and groundfish harvest during the months of October, November and December; these are the months that would have been closed to fishing in 2010 and 2011, and also the months that could be funded with some amount of additional unused PSC from the RP CV sector under the action alternatives. As with other GOA time series data, the sector’s post-September PSC usage and groundfish harvest vary widely, with no discernible trend or correlation. Taking the measure of central tendency as an indicator, the non-RP CV sector might expect to need around 900 Chinook salmon PSC in order to fully prosecute the fall non-pollock fisheries (Pacific cod and flatfish) to historical levels, meaning that it should limit PSC usage in the spring and summer to around 1,800 Chinook. However, in the highest years of late-year PSC (2009 and 2010), the sector would need to limit early-year usage to around 1,000 Chinook salmon. Pre-October PSC usage in the sector was greater than 1,000 Chinook salmon in three of the six analyzed years (2007, 2010 and 2011), ranging between 1,612 and 2,582.

Table 4-15 Chinook salmon PSC and groundfish harvest (mt) in the GOA non-Rockfish Program CV sector taken from October to December

	2007	2008	2009	2010	2011	2012	Average
Chinook PSC	257	208	1,776	1,620	967	519	891
Groundfish Harvest	3,379	7,221	4,606	4,627	3,549	6,076	4,910

With a hard cap of 2,700 Chinook salmon PSC and no potential rollover, the non-RP CV sector’s ability to make deliveries in the fall could hinge upon its ability to limit PSC in April and May. The sector would not likely face a fall closure if spring PSC conforms to the monthly average levels – combining to equal 850 – presented in Table 4-5. As with other historical records, annual records are highly variable around this average, ranging from zero Chinook PSC in 2012 to 2,156 in 2010. As before, years of high spring PSC do not correspond to years of the highest groundfish (flatfish) harvest.

Looking to the future, spring Chinook salmon PSC in the non-RP CV sector could increase relative to historically observed levels, due to forthcoming changes in trawl halibut PSC management. Spring trawl harvest has typically been constrained by the second season limit on trawl halibut PSC, in which the CV and CP sectors share 395 mt of halibut mortality, available for use between April 1 and July 1. In the past, 296 mt of the seasonal limit has been apportioned to the deep-water complex, which includes rockfish, arrowtooth flounder and rex sole. The deep-water complex was closed to trawl fishing on halibut PSC in June of every analyzed year (2007 to 2012). It was closed for all of May from 2008 to 2012, and for the latter half of May in 2007. Finally, it was closed for the last weeks of April in every year except for 2007.

These closures have effectively reduced Chinook salmon PSC levels by stopping the arrowtooth flounder and rex sole fishery for a significant portion of each spring. Upon the implementation of the proposed rule for GOA Amendment 95 (revised halibut PSC limits), available deep-water and shallow-water complex halibut PSC from the second season allocation may be combined and used in either complex from May 15 to June 30. This change is likely to increase the amount of halibut mortality available to flatfish trawlers in May and June, and result in some amount of Chinook salmon PSC counted against the non-RP CV hard cap that was not being taken during the analyzed historical period. Any such increase has the potential to exacerbate the effects of a potentially constraining sector hard cap that will be experienced in the fall; the likelihood of fall closures may increase, as could the maximum potential closure impacts noted above.

Whether or not these impacts are realized depends partly upon unpredictable natural variation in Chinook salmon PSC, but also upon the private incentives and business decisions of the vessels involved in the non-RP CV fisheries. As mentioned in Section 4.2.3, 33 of the 72 vessels that were active at some point since 2007 in the GOA non-pollock trawl fishery displayed no participation in the non-pollock fall fisheries, though 19 of those 33 vessels did fish for pollock after September. These vessels may have a low incentive to alter their fishing behavior or refrain from expanding their spring flatfish harvest in order to reserve available PSC for the end of the year.¹⁷

Should the non-RP CV sector of the GOA non-pollock fishery be closed on PSC, vessels could shift effort to other fisheries. Fifty-seven of the 71 vessels that have participated in the non-RP fishery since 2007 have fished for pollock in the fall seasons. Thirty-nine CVs fished pollock in 2012, though five of those vessels were not involved in any GOA non-pollock fisheries. Also, Section 4.2.2.1 noted that 23 non-RP CVs are endorsed to fish Bering Sea pollock as part of AFA cooperatives. The B season for AFA catcher vessels runs from June 10 to November 1, though fleet activity primarily starts in September due to pollock size distribution, and sometimes slows during October because of high Chinook salmon bycatch rates.

4.3.2 Alternative 2: Roll over all but 104 to 208 of the Chinook PSC remaining in the Rockfish Program CV apportionment on October 1; maintain uncertainty pool mechanism

As described in Section 2.2, Alternative 2 would mesh the uncertainty pool mechanism defined in the Council's June 2013 preferred alternative with the rollover provision that was considered at that meeting but not advanced. The rollover provision would, on October 1, shift some portion of the unused Rockfish Program CV sector Chinook salmon PSC apportionment to the non-RP CV sector. Alternative 2 is based on the rollover provision as it was presented in the original EA/RIR, which considers a GOA fleet-wide rollover of all unused Chinook PSC from the RP CV sector, *less* either 200, 300 or 400 Chinook (NPFMC 2013). At the present stage, the Council is only considering a rollover to the CV sector of the non-RP fisheries, so those values are adjusted in accordance with the non-pollock CV sector's total apportionment of the allowable PSC – 52%, based on historical PSC usage from 2007 to 2011. This adjustment results in three potential October 1 rollovers to consider: (Option 1) all but 104 of the unused RP CV Chinook PSC; (Option 2) all but 156 of the unused RP CV Chinook PSC; and (Option 3) all but 208 of the unused RP CV Chinook PSC. The analyst assumes that any remaining PSC that is *not* rolled into the non-RP CV sector on October 1 remains available for use during fishing that occurs under the authority of a RP cooperative between October 1 and November 15.

¹⁷ The analyst does not have access to vessel co-ownership information that could reveal whether or not any of the vessels that do not depend of fall harvest might have a shared business interest in the success of the late-year GOA trawl fisheries.

The general impacts of an annual 1,200 Chinook salmon PSC limit for the RP CV sector are described in Section 4.3.1. By reincorporating the rollover provision, however, Alternative 2 introduces an element of strategic behavior into the business planning of the RP fleet and cooperatives. By and large, vessels participating in the RP CV fishery also participate in the fall non-pollock trawl fisheries (Table 4-14). As such, these vessels have an interest in ensuring that sufficient Chinook PSC is available to target Pacific cod and flatfish in the post-September months.

Table 2-3 reports the amount of Chinook salmon PSC in the RP CV sector, by year, and the annual average over the analyzed period (843 Chinook). Had any of the Alternative 2 options been in place from 2007 to 2012, there would have been an October 1 rollover of PSC to the fall non-RP CV fishery in all but one year. For each option, Table 2-4 gives the amounts of the rollovers that would have occurred, and the period average rollover amount. Aside from the year of particularly high Chinook PSC in the RP CV sector (2008), the average rollover to the fall non-RP CV sector would have been between 314 and 418 Chinook PSC, depending on the selected option. The maximum rollover in any year would have been 728 Chinook PSC, observed under Option 1. The minimum rollover (excluding the year in which the RP CV sector would have used its entire 1,200 Chinook PSC limit) would have been 27 Chinook PSC, observed under Option 3. Noting that the non-RP CV sector averages 891 Chinook PSC after October 1, with wide annual variability around that figure, it appears unlikely that the amount rolled over from the RP CV sector would, by itself, fully meet fall PSC demand in all years. However, depending on pre-October Chinook encounter in the non-RP CV sector, and how much PSC remains from the sector's base apportionment – 2,700 or 3,060 depending on whether or not the sector is carrying an uncertainty buffer from the previous year – the October 1 rollover could extend the Pacific cod B season and fall flatfish fisheries. Historical weekly PSC levels provide a very rough measure of how long a rollover might extend the fishery. If, after receiving the rollover, the non-RP CV sector initially targets Pacific cod, weekly PSC might be on the order of 50 Chinook salmon and the fishery would stay open for at least a month. This might be the case if the non-RP CV sector was closed on PSC during September and is waiting for the rollover to open the Pacific cod fishery. If the non-RP CV sector uses the rollover to target flatfish, or a mix of flatfish and Pacific cod, weekly PSC might be closer to 150 Chinook and the fishery would be extended by around one to three weeks.

Given the unpredictability of annual Chinook salmon encounter, further exploring the permutations of rollover amounts is of limited use. It is sufficient to say that if Chinook salmon PSC in the RP and non-RP CV sectors is low, the RP sector will prosecute the Program fishery in much the same way as it has done historically – that is, avoiding Chinook and halibut PSC to the extent practicable, while focusing on fully harvesting TACs for the primary and secondary managed species allocated to the Program. If Chinook PSC in the RP sector is low or average, and PSC in the non-RP sector is high, the RP CV sector would likely continue prosecuting the Program fishery as it has done in the past, with moderate confidence that the rolled over amount of Chinook PSC – on the order of 250 to 550 Chinook salmon, based on the 25th and 75th percentiles of the historically simulated rollovers – should be sufficient to see the fall non-RP fishery through the valuable Pacific cod B season. Finally, if Chinook PSC is high in both the RP and the spring/summer non-RP fishery, the RP CV sector will face a business decision at the inter-cooperative level of weighing RP harvest against some marginal amount of Pacific cod and flatfish harvest. Trading one valuable harvest opportunity for another would seem to be a “zero-sum” decision. However, given the nature of a hard-capped fishery, this situation would likely result in greater net benefits during a high PSC year than are available under the “no action” alternative, where the fleet does not have to ability to seek an agreeable balance between harvest opportunities in the two fisheries.

As noted in Section 4.2.3, a subset of the CV fleet does not participate in the fall non-pollock fisheries; these are overwhelmingly non-RP vessels (one vessel with this participation history spent one year in the Rockfish Pilot Program). It might be the case that these vessels will fish in a manner that maximizes spring and summer flatfish harvest at the cost of additional Chinook PSC that is debited against the non-

RP CV apportionment; it also bears repeating that the implementation of Amendment 95 could increase non-RP CV sector flatfish harvest – and Chinook PSC – during May and June, as described in Section 4.3.1. If this behavior does emerge, the RP CV sector might feel a burden to “provide” a rollover to support fall fishing. That feeling could re-order some of the priorities in Rockfish co-op management. For example, temporary stand-downs to avoid Chinook could slow deliveries to shore-based processors during May and June; increasing product flow stability during those months was among the Program’s original management goals. The likelihood of this behavior in the non-RP CV sector may depend on the business relationships and ownership linkages between the vessels that do and do not depend on fall fisheries. This type of information is not available to the analyst, so the report does not speculate on whether or not this will occur. This potential challenge is more a symptom of a hard cap bycatch management structure, which has already been determined, than of including a rollover provision. If anything, allowing a rollover creates at least some possibility of relief for vessels that depend on fall fishing if a race for bycatch does emerge.

Interaction with the “uncertainty pool” mechanism

In considering a rollover provision, the Council expressed that the integrity of the annual Chinook PSC hard cap, as envisioned under the uncertainty pool mechanism, should be maintained. Under Alternative 2, the RP CV sector can earn an uncertainty buffer of 160 Chinook salmon to be carried forward into the following year. A key stipulation of the uncertainty pool mechanism is that a sector’s average Chinook PSC over a number of consecutive years must not exceed its base PSC apportionment – 1,200 Chinook, for the RP CV sector. If the RP CV sector carries over 160 Chinook into Year 2, and then uses that extra allowance in a high-PSC year, then those 160 fish *must* have been truly “saved” in Year 1.

If the Council selects Options 1 or 2 to Alternative 2, only 104 or 156 of the RP CV sector’s unused Chinook PSC would be held back, and the rest would roll over for potential use during the fall. These options allow for possible scenarios where some of the RP CV sector’s avoided PSC, for which the sector earned a Year 2 uncertainty buffer, are taken in the non-RP CV fall fisheries during Year 1. Consider an example where the RP CV sector takes 1,000 Chinook salmon – a high PSC year relative to historical levels, but low enough to qualify for its proportional share of the uncertainty pool in Year 2 (160 Chinook); the RP CV sector then utilizes its full base apportionment plus the earned uncertainty buffer in Year 2 (1,360 Chinook). The RP CV sector would have avoided 200 Chinook PSC in Year 1, relative to its 1,200 Chinook annual hard cap. The non-RP CV sector would have received a rollover of either 96 Chinook (Option 1) or 44 Chinook (Option 2). However, if more than 40 of those rolled-over Chinook are taken, the non-RP CV sector would be dipping into the 160 PSC that the RP CV sector avoided in Year 1 and then (would have) utilized in Year 2. If the RP CV sector had used only 800 Chinook PSC, again qualifying for the 160 Chinook uncertainty buffer in Year 2, the non-RP CV sector would need to utilize no more than 240 Chinook in the fall non-pollock fisheries, even though the rollover that it received was 296 Chinook (Option 1) or 244 Chinook (Option 2).

Summarizing to this point, if there is a possibility that the non-RP CV fishery will use *all* of the Chinook PSC available to it – its base apportionment of 2,700, any uncertainty buffer that it may be carrying from the year before, and any October 1 rollover that it receives from the RP CV sector – then the integrity of the RP CV sector’s uncertainty buffer is best maintained by selecting a rollover option that holds back at least 160 Chinook PSC. This would be accomplished under Option 3 to Alternative 2 (roll over “all but 208” unused Chinook PSC).

Selecting Option 3 does have a downside that could eliminate the PSC rollover in years when it would otherwise have occurred under Options 1. If the RP CV sector has taken at least 1,041 Chinook salmon by October 1, then it is assured that the sector will not qualify for a 160 Chinook uncertainty buffer in the following year. As a result, double-counting PSC in that year’s fall non-RP fishery and the next year’s RP

uncertainty buffer is not an issue. Consider an example where the RP CV sector takes 1,050 Chinook salmon and no Year 2 uncertainty buffer is earned. Only 150 Chinook have been avoided, and none could be rolled over under Option 3 (or Option 2, for that matter). However, under Option 1 the fall non-RP CV fishery could receive 104 Chinook to help support fishing after October 1, and there would be no risk of that PSC being “re-used” in the following year’s RP CV fishery. This circumstance where Option 1 is superior to Option 3 can only occur if the RP CV fishery takes between 1,041 Chinook (no uncertainty buffer earned) and 1,095 Chinook (nothing left to roll over under Option 1). This is a rather narrow window of possibility, and the rollover’s marginal benefit to the non-RP CV sector diminishes substantially as the RP CV sector’s PSC use gets close to 1,095.

Choosing Options 1 or 2 to Alternative 2, which provide marginally more Chinook salmon to the fall fisheries during years of low PSC use in the RP CV sector, would require further catch accounting stipulations. In the first example 96 Chinook were rolled over to the fall non-RP CV fishery, but only 40 could be used without impacting the RP CV sector’s ability to use its entire uncertainty buffer in the following year. The Council could consider making those 56 potentially double-counted fish available only to RP co-op members who have checked out of the RP CV fishery for the year; the amount of those 56 fish that are used in Year 1 would still have to be deducted from the RP CV sector’s Year 2 uncertainty buffer. Doing so would benefit RP CVs that prosecute the fall non-rockfish fisheries at a cost to other RP vessels, or vessels that did not join an RP co-op until Year 2. Another possibility is to allow the non-RP CV sector to utilize the entirety of the rollover that it receives, but obligate the sector to restore the RP CV’s Year 2 uncertainty buffer by reimbursing the missing PSC from its own Year 2 base apportionment. This would result in a Year 2 Chinook PSC limit of less than 2,700 for the non-RP CV sector, and could potentially benefit vessels that operated in the fall, at a cost to those that did not. These options, or others that the Council might envision, create a number of issues: (1) vessels that do not participate in the fall could be disadvantaged in Year 2; (2) additional programming and catch accounting burdens may be placed on NMFS staff; and (3) the overall PSC limit program would be moving away from the clean three-sector approach that the Council outlined in its June 2013 preferred alternative. The benefit of selecting Options 1 or 2, relative to Option 3, would be the opportunity to utilize an additional 52 or 104 Chinook salmon PSC.

Finally, the discussion up to this point has not addressed the fact that some amount of Chinook salmon PSC could occur within the RP CV sector *after* October 1. The sector’s PSC usage in those months was very low during the analyzed years; the period average was three Chinook per year, which represents 19 Chinook PSC in one year and zero in the other five. That is not to say, however, that there could not be randomly high PSC events in the future. The Council may wish to consider whether the amount of PSC that is not rolled over (104, 156 or 208 Chinook salmon) is sufficient to support October and November activity in the RP CV sector. Regulations may need to specify how catch accounting would deal with a lightning strike PSC event in the RP CV sector after the rollover, and whether any PSC in addition to the amount held back from the rollover could be recalled from the non-RP CV sector to cover it.

4.3.3 Alternative 3: Roll over all but 160 of the Chinook PSC remaining in the Rockfish Program CV apportionment on October 1; maintain uncertainty pool mechanism

The Council chose to consider holding back precisely 160 Chinook salmon in the RP CV sector because that is the amount of Chinook in the sector’s uncertainty buffer. Keeping those 160 Chinook allowances within the sector prevents a scenario where the PSC that is marked for possible use in case of high-PSC during the following year is, instead, caught by the non-RP CV sector in the fall.

Alternative 3 and Option 2 to Alternative 2 differ only in that Alternative 3 requires four additional Chinook salmon PSC to remain with the RP CV sector at the time of the October 1 rollover. As such, the potential impacts on fleet behavior and Chinook avoidance incentives are much the same as those

described in the previous section. In short, most RP CVs participate in the non-Program fall fisheries, so they have an incentive to preserve a viable rollover to support that activity. On the other hand, a significant number of non-RP CVs do not participate in the fall at all, and therefore have little cause not to fish up to their sector's base apportionment of 2,700 Chinook by the end of the spring flatfish season. Those vessels have equally little incentive to limit Chinook PSC to the non-RP CV sector's uncertainty pool threshold (2,340), since the benefits of any Year 2 uncertainty buffer are most valued in the fall. In broad terms, the responsibility for keeping the post-September fisheries open could fall on the RP CVs, which forces the cooperatives to make a harvest-for-harvest trade-off decision. This situation could pose challenges in years of high PSC, and the vessels that are most likely to be impacted are those that depend upon fall Pacific cod and flatfish revenues. That said, these relative advantages and disadvantages are mainly the effect of hard cap PSC limits in general, and incorporating a rollover mechanism is likely to at least provide the fleet with a tool to mitigate the negative impacts of high PSC years.

Table 2-5 shows how much PSC Alternative 3 would have rolled over to the non-RP CV sector on October 1 of each year since implementation of the Rockfish (Pilot) Program. A rollover would have occurred under Alternative 3 in all but the single highest PSC year for the RP CV sector. The historical rollover amounts ranged between 75 and 672 Chinook PSC. Excluding the year when no rollover would have occurred, the average amount made available to the non-RP CV fall fisheries was 362 Chinook salmon. The median rollover amount would be around 250 Chinook salmon, depending on whether or not the year of abnormally high RP CV PSC is taken into account. As noted in the previous sections, the extent to which a rollover would prolong the fall non-RP CV sector's activity depends on how many Chinook salmon that sector has encountered up to October 1 in a given year. The earlier sections noted that weekly PSC averages around 50 Chinook salmon when the non-RP CV sector is focused mainly on Pacific cod, and increases to around 150 Chinook salmon when flatfish effort picks up. It also bears repeating that future spring and summer Chinook salmon encounter in the non-RP CV sector might increase, as changes to the halibut PSC regulations could create new opportunities to extend April flatfish activity into May and June. This change in historical effort patterns could increase the fall fisheries' reliance on a rollover from the RP CV sector.

Rolling over all but 160 of the RP CV sector's allowable PSC to another sector on October 1 brings the RP CV sector right up to its annual threshold for earning the uncertainty buffer in the following year. Consider the example where the RP CV sector takes 1,000 Chinook salmon before October 1. If all but 160 of the remaining 200 Chinook PSC allowances are rolled into the non-RP CV sector, the next Chinook recorded on a Rockfish Program trip would bring the sector's remaining PSC to 159. Catch accounting – and the agents responsible for administering the uncertainty pool – would have to track that this was, in fact, only the 1,001st Chinook salmon taken in the sector.

4.3.4 Alternative 4: Roll over any unused Chinook PSC remaining in the Rockfish Program CV apportionment on November 15 or when all CV cooperatives have checked out of the Program; do not include Rockfish Program CV sector in the uncertainty pool mechanism

Under Alternative 4, the Rockfish Program catcher vessel sector could roll over the entirety of its unused Chinook salmon PSC to the non-RP CV sector. There would be no "hold back" requirement, because selecting Alternative 4 removes the RP CV sector from the uncertainty pool program defined in the Council's existing preferred alternative. With no Year 2 uncertainty buffer to protect against potential double-counting, there is no reason to strand unused Chinook PSC in the RP CV sector, unless it was the Council's intention to build in a PSC retirement. Noting that the Council's PA set the total GOA CV Chinook PSC apportionment at a level meant to accommodate the operational type sector's average annual PSC usage – if not its usage in the highest PSC years – without arbitrarily disadvantaging one CV sector relative to the other, the analyst assumes that the combined CV apportionment of 3,900 Chinook salmon per year is intended to support historical harvest opportunities to the extent possible.

The primary motivation for removing the RP CV sector from the uncertainty pool mechanism is to facilitate the full rollover of all unused PSC. Historical PSC levels in the sector (an average of 843, median of 795) suggest that a rollover is likely to occur in most years. Furthermore, the PA apportions the RP CV sector more “excess” PSC, compared to its annual average, than it does for the other GOA non-pollock trawl sectors. In a future year that conforms to historical measures of central tendency, one might view the RP CV sector’s Chinook PSC allowance as over-funded – potentially at the expense of the fall fisheries.

As discussed in the original RIR (NPFMC 2013, Section 4.7.3, p.199), managing bycatch with hard caps carries an inherent perverse incentive to utilize PSC up to the limit. The uncertainty pool mechanism was, in part, included in the PA to lower the level of Chinook PSC up to which a sector would be indifferent. One must at least acknowledge the possibility that, without the uncertainty buffer incentive, the RP CV sector would be just as well off taking all of the 1,200 Chinook salmon that it is permitted as it would be when limiting Chinook PSC to the greatest extent practicable. However, this analysis suggests that the RP CV sector is likely to actively avoid Chinook PSC and provide a rollover. Table 4-14 indicates that, on average, 87% of the CVs that are active in the Rockfish Program also participate in the non-RP fall fisheries; those that do not fish in the fall still have an interest in maintaining positive business relationships with their cooperative partners.

Moving forward under the assumption that RP CVs generally have a vested interest in making PSC available to the fall Pacific cod and flatfish fisheries, the cooperatives’ greatest challenge under Alternative 4 will be when to execute the rollover. The Alternative states that the rollover will occur either when all RP cooperatives have checked out of the fishery or on November 15, whichever comes first.

Historical cooperative management decisions are not informative about *when* co-ops would prefer a coordinated end to Program fishing, because they have had no reason to do so in the past. Under existing regulations, there is no incentive to conclude the RP season early unless halibut PSC is constraining the post-September (5th halibut PSC season) non-RP fishery. If it were, RP cooperatives could check out – one at a time, if others were still active in the Program fishery – and roll 55% of their unused halibut PSC into the unapportioned halibut mortality limit for the October 1 through December 31 period. Since the (Pilot) Program was implemented in 2007, the Program has not approached its own limit for halibut mortality¹⁸, and post-September halibut PSC has never been so constraining that all of the cooperatives had to check out of the Rockfish Program.

The timing of any coordinated check-out by the RP CV cooperatives would be determined by three factors: (1) the amount of allocated RP harvest quota remaining at a given time; (2) the amount of Chinook PSC remaining in the non-RP CV sector’s apportionment, which is largely determined by the amount of Chinook salmon taken in the April flatfish fishery; and (3) the anticipated start date for the Pacific cod B season, or the related start date for the pollock C season.

The first factor is fairly straight-forward, as harvest of rockfish and its secondary species is highly valued. Given the fact that *all* RP cooperatives must check out in order to roll over Chinook PSC, it is possible that one cooperative could hold up the rollover in order to finish harvesting its Program quota. If this issue were to arise, it would likely force an inter-cooperative decision in September, when both pollock and Pacific cod fisheries could potentially be open. If the need for a rollover looks imminent, cooperatives are more likely to shift their Program harvest to earlier in the year, as opposed to leaving it unharvested. The RP CV sector historically lands around 800 mt of groundfish in September, 475 mt in October, and

¹⁸ The highest level of halibut PSC in the RP fishery was 87 mt of the 191.4 mt allocated, in 2012.

300 mt in November (from a total average annual sector harvest of 9,200 mt). Shifting this harvest to earlier in the summer could impact processor operations, where predictability and distribution of product delivery over time are not only among the objectives of the Rockfish Program, but also important to employment patterns, product value and profitability. The PSC impact of moving up RP harvest to accommodate an earlier rollover are not clear; Chinook PSC rates in the Program tend to be lower in July and August than in September (Table 4-12), but racing to harvest rockfish quota quickly could carry a marginal trade-off in efforts made to avoid Chinook salmon.

The second factor can be gauged using historical data, with the caution that seasonal PSC usage patterns have varied greatly from year to year. In a characteristic year, the non-RP CV sector uses 930 Chinook PSC by the end of April, and 1,141 by the end of August. Neither one of those benchmark levels would raise concern in the RP CV sector about the need to terminate the Program fishery early in order to support the opening of the Pacific cod B season. However, the non-RP CV sector's cumulative PSC use at the end of April has ranged from 148 Chinook salmon (2007) to 2,516 (2011). This is notwithstanding the possible future increase in Chinook PSC encounter during May and June, as described in Section 4.3.1, which have typically been periods of very low PSC use. Cumulative PSC use at the end of August has ranged from 216 Chinook salmon (2009) to 2,575 (2011). If the RP CV sector experiences negative effects from shifting or curtailing its harvest in order to fund PSC demand in the fall fisheries, it is likely because the non-RP CV sector recorded high PSC rates in the spring. If those high PSC rates were the result of either increased effort or revenue-maximizing PSC-intensive practices, then one might conclude that the non-RP participants who do not fish in the fall expropriated rents from the rest of the CV fleet.

If, by the end of August, the non-RP CV sector has used most or all of its base PSC apportionment and any uncertainty buffer that it is carrying from the previous year, pressure on the RP CV sector to check out of the Program fishery and roll unused PSC into the non-RP sector would increase. The Pacific cod fall fishery does not always begin on the September 1 opening date defined in regulation. Sometimes actions are coordinated with the pollock C season, which may itself coordinate a voluntary standdown during late August and early September to avoid high PSC rates or to negotiate with processors on an ex-vessel price. A delayed start might not necessarily affect the total season's harvest value as long as the TAC is eventually harvested, but it could disrupt planned product flows from processors to markets. The fishery could lose some amount of harvest efficiency if the fleet is ready to begin the pollock season, but retention of Pacific cod is still restricted due to Chinook PSC, and awaiting a rollover from the RP sector.

5 Initial Regulatory Flexibility Analysis

[TO BE COMPLETED]

6 References

Allen, B. M., and R. P. Angliss. 2012. Alaska marine mammal stock assessments, 2011. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-234, 292 p.

NMFS. 2004. Programmatic Supplemental Environmental Impact Statement for the Alaska Groundfish Fisheries Implemented Under the Authority of the Fishery Management Plans for the Groundfish Fishery of the Gulf of Alaska and the Groundfish of the Bering Sea and Aleutian Islands Area. NMFS Alaska Region, P.O. Box 21668, Juneau, AK 99802-1668. June 2004. Available at <http://www.alaskafisheries.noaa.gov/sustainablefisheries/seis/intro.htm>.

NMFS. 2005. Environmental impact statement for essential fish habitat identification and conservation in Alaska. April 2005, U.S.DOC, NOAA, NMFS; Alaska Region, P.O. Box 21668, Juneau, AK 99802-1668.

- NMFS. 2007. Environmental impact statement for the Alaska groundfish harvest specifications. January 2007. National Marine Fisheries Service, Alaska Region, P.O. Box 21668, Juneau, Alaska 99802-1668. Available: <http://www.alaskafisheries.noaa.gov/index/analyses/analyses.asp>.
- NPFMC. 2012. Environmental Assessment/Regulatory Impact Review/Initial Regulatory Flexibility Analysis to Revise Gulf of Alaska Halibut Prohibited Species Catch Limits, Amendment 95. August 2012.
- NPFMC, 2013. Environmental Assessment/Regulatory Impact Review/Initial Regulatory Flexibility Analysis for Chinook Salmon Prohibited Species Catch in the Gulf of Alaska Non-Pollock Trawl Fisheries. May 15, 2013.
- Zador, S. 2012. Ed. Ecosystem Considerations for 2013. Appendix C to Stock Assessment and Fishery Evaluation Report. November 2012. NPFMC, Anchorage.