

## 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 trawl catch of Chinook salmon. 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: Roll over 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]

Alternative 5: Roll over all Chinook PSC but 50 or 100 fish remaining in the Rockfish Program CV sector Chinook cap on October 1. Any salmon remaining when the Rockfish Program fishery closes will be released to the other CV non-pollock fisheries on November 15. No uncertainty buffer would apply to the Rockfish Program CV sector.

**(Council's preliminary preferred alternative)**

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 PSC, 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>		<i>16%</i>	<i>36%</i>	<i>48%</i>
Base PSC Limit	<b>7,500</b>	1,200	2,700	3,600
Uncertainty Pool Threshold	<b>6,500</b>	1,040	2,340	3,120
Uncertainty Pool Buffer	<b>1,000</b>	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.

### Alternative 5

Alternative 5, the Council's preliminary preferred alternative (PPA), would create a date-certain October 1 rollover of unused Chinook salmon PSC – less some amount held back – from the RP CV sector to the other non-pollock CV fisheries. The alternative contains two options for the hold-back amount: **50** Chinook salmon (Option 1), or **100** Chinook salmon (Option 2). The PPA removes the RP CV sector from the uncertainty pool mechanism, obviating the need for Chinook PSC allowances to be held back to preserve salmon savings that might be utilized in the form of the following year's uncertainty buffer. The Chinook PSC that is held back on October 1 serves only to cover any Chinook encounter that occurs within the RP CV sector after the rollover date. Any PSC remaining in the RP CV's annual apportionment of 1,200 Chinook salmon would be rolled over upon the Rockfish Program's regulatory closure date (November 15).

### **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, generating around \$10 million in gross first wholesale revenues, or around two-thirds of the average annual groundfish wholesale 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 generated from the sector's catch are 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. The range of potential rollover amounts – as they would have occurred from 2007 to 2012 – assumes that “unused” PSC as of October 1 is counted in relation to the RP CV sector’s base apportionment of 1,200 Chinook.

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 PSC 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).

The Council could clarify that the rollover should be calculated in relation to an RP CV annual allowance of 1,360 during years in which the sector is carrying an uncertainty buffer from the preceding year. Doing so would increase the potential size of the rollover by 160, but would not change the fact that less than 1,040 of the Chinook PSC allowances that began the year with the RP CV sector must be taken in order for that sector to receive an uncertainty buffer in the following year.

### 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. As with Alternative 2, the Council could clarify that the rollover amount should be calculated in relation to a starting RP CV allowance of 1,360 Chinook PSC, when applicable; however, the avoidance threshold for earning an uncertainty buffer in the following year would remain at 1,040 of the RP CV’s allowable Chinook.

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 Chinook salmon 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.

#### Alternative 5 (preliminary preferred alternative)

The PPA makes the initial PSC rollover date-certain on October 1, at time that can be crucial to the prosecution of the valuable Pacific cod B season during a year in which the non-RP CV sector records high spring Chinook PSC levels. While the RP cooperatives would not have the ability to dictate a rollover on the September 1 start of the Pacific cod season, a date-certain rollover alleviates pressure on RP cooperatives to complete fishing early or to leave rockfish quota unharvested if fall fisheries require PSC allowances in order to open. Establishing a



consistent rollover date also reduces business planning uncertainty as the need for additional Chinook PSC allowances in the non-RP sector becomes apparent.

Stakeholders who participate in both the RP and non-RP CV sectors indicated to the Council that the ability to utilize additional Chinook PSC allowances in the fall is more beneficial to their operations than is the opportunity to increase their maximum potential RP Chinook PSC allowance from 1,200 to 1,360. Chinook PSC encounter in the RP sector has rarely approached either of those levels. In contrast, Chinook PSC in the non-RP CV sector has reached potentially constraining levels in the past, is highly variable, and could increase due to forthcoming changes to halibut PSC regulations that might facilitate increased spring flatfish effort. This analysis supports the notion brought forward during public testimony that alternatives removing the RP CV sector from the uncertainty pool and increasing the potential size of the Chinook PSC rollover provide a likely benefit to the fleet at a low expected cost.

By removing the RP CV sector from the uncertainty pool mechanism, the PPA reduces the need to hold back Chinook PSC from the rollover. With no uncertainty buffer to ensure for the following year, the amount of PSC held back can be selected primarily on the basis of how much Chinook salmon encounter the RP CV sector might expect between October 1 and November 15. The hold back options in the PPA – 50 or 100 Chinook PSC – are smaller than the 160 Chinook minimum savings target under the alternatives that keep the RP CV sector in the uncertainty pool.

Based on the first six years of the RP CV fishery, either 50 or 100 Chinook salmon PSC would have been sufficient to support the sector's activity from October 1 through the end of the season. However, PSC trends could change in the future, resulting in either higher or lower post-rollover PSC in the RP CV sector. As co-ops prioritize active PSC rate management, more voluntary standdowns in May could shift effort to later in the year; seasonal PSC rates could vary due to environmental or other unobservable factors; or TAC levels for allocated RP species could increase or decrease relative to present levels. Even considering the low historical PSC rates during this calendar period, a post-rollover PSC limit of 50 or 100 Chinook salmon provides a narrow range for precise inseason management of the RP fishery. Knowing that NMFS might have to close the fishery to prevent a PSC overage could cause RP CV participants to take a risk-averse strategy and fish as much as possible prior to October 1. That response would, in turn, further decrease the expected level of Chinook PSC taken after the rollover. While post-rollover PSC levels in the RP CV sector are not expected to be large, either of the two hold-back options present NMFS inseason management with a challenging task during exceptional years. Given this fact, and recognizing that confidence in seasonal Chinook PSC forecasts is limited, the Agency has indicated a preference for the larger hold-back option of 100 Chinook salmon.

Holding back 100 Chinook PSC for the RP CV sector upon the initial rollover might benefit the CV fleet as a whole. First, based on the ample size of most historically simulated rollovers, rolling over an additional 50 Chinook does not improve the expected outcome for the non-RP CV sector by a large margin. On October 1, the amount remaining in the sector's annual base apportionment (2,700 Chinook) has been observed at over 2,000, and less than 200. The median October 1 PSC remainder was 1,570, or 1,930 if the sector had begun the year with a 360 Chinook uncertainty buffer. The rollover is most critical in years when the non-RP sector's October 1 PSC remainder is low, so those instances should be the focus of the choice between hold-back options under the PPA. In these cases, even the low end of the historically observed range of rollovers (150 Chinook) would be a substantial benefit. In the rare case when the non-RP sector has used its entire PSC allowance by October 1, the low end of the historical

rollovers would still facilitate a significant portion of the Pacific cod B season. Though improbable, a partial loss of the cod season represents the worst of the foreseeable scenarios in a high PSC year. That outcome would not be significantly improved by 50 additional Chinook PSC, and it is not clearly worse than the combination, in every year, of a rush to finish the RP season early and the extra challenge of managing the RP fishery to a 50 Chinook PSC seasonal limit under Option 1. Second, selecting Option 2 would comport with the Agency's preference for a marginally more manageable RP CV sector between October 1 and November 15. While it is small in terms of active vessels, managing that fishery with 50 Chinook PSC could have the real effect of closing the sector after only one small Chinook encounter; even if some of the 50 Chinook allowance remains, NMFS might have to close the fishery based on projected PSC rates and the number of vessels active. Option 2 might also mitigate a further time shift in RP effort, where late-season vessels might rush to complete their RP harvest before October 1.

The PPA allows any of the held-back Chinook PSC that is not used in the post-rollover RP CV sector to be used in the other fall fisheries after November 15. Chinook PSC in the non-RP CV sector is typically low after November 15. The CV fleet's Chinook PSC during that time has averaged around 40 fish, with one high-PSC year of 100, and two years where no salmon were taken after mid-November. Judging from the historical period, the sector might expect to have around 500 to 800 PSC remaining in its apportionment in mid-November. This portion of the non-pollock CV fishery, which has accounted for between 0.4% and 2.3% of annual first wholesale value from the fishery, would likely be sustained by the sector's remaining PSC apportionment and the expected November rollover in all but the most unusual years.