INITIAL REVIEW DRAFT

**Environmental Assessment/ Regulatory Impact Review/
Initial Regulatory Flexibility Analysis
for 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

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Abstract: This document analyzes proposed management measures that would apply to all trawl fishing by catcher vessels (CV) in the groundfish fisheries of the Central and Western Gulf of Alaska (GOA), except the directed pollock fishery. Trawl fishing in the GOA is limited by prohibited species catch (PSC) of Chinook salmon (*Oncorhynchus tshawytscha*). PSC limits cap the amount of Chinook salmon that can be taken in the trawl fishery (or a sector of the fishery); directed fishing with trawl gear is closed if that limit is met. The action alternatives under consideration would increase the existing Chinook salmon PSC limits for non-pollock trawl CVs, and CVs fishing under the authority of a Central GOA Rockfish Program cooperative quota permit. Implementation of the management measures evaluated in this analysis would require an amendment to the Fishery Management Plan for Groundfish of the Gulf of Alaska (GOA Groundfish FMP), as well as amendments to implementing regulations.

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List of Acronyms and Abbreviations

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	*Federal Register*
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
t	tonne, or metric ton
NAICS	North American Industry Classification System
NAO	NOAA Administrative Order
NEPA	National Environmental Policy Act
NMFS	National Marine Fishery Service
NOAA	National Oceanic 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 and Halibut Observer Program
OEG	optimal escapement goal
OMB	Office of Management and Budget
PBR	potential biological removal
PSC	prohibited species catch
PPA	Preliminary preferred alternative
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
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

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Executive Summary

This document analyzes proposed management measures that would apply to all trawl fishing by catcher vessels (CV) in the groundfish fisheries of the Central and Western Gulf of Alaska (GOA), except the directed pollock fishery. Trawl fishing in the GOA is limited by prohibited species catch (PSC) of Chinook salmon (*Oncorhynchus tshawytscha*). PSC limits cap the amount of Chinook salmon that can be taken in the trawl fishery (or a sector of the fishery); directed fishing with trawl gear is closed if that limit is met. The action alternatives under consideration would increase the existing Chinook salmon PSC limits for non-pollock trawl CVs, and CVs fishing under the authority of a Central GOA Rockfish Program cooperative quota permit. Implementation of the management measures evaluated in this analysis would require an amendment to the Fishery Management Plan for Groundfish of the Gulf of Alaska (GOA Groundfish FMP), as well as amendments to implementing regulations.

Purpose and Need

The Magnuson-Stevens Act (MSA) National Standards require the Council to balance the objectives of achieving optimum yield, minimizing bycatch, and minimizing adverse impacts on fishery-dependent communities. Chinook salmon PSC taken in GOA trawl fisheries is a resource concern, and the Council has taken action to set hard cap PSC limits that are below the incidental take amount that would trigger reconsultation under the Endangered Species Act (ESA). Attainment of a PSC hard cap closes the trawl fishery. Since the 2015 implementation of Chinook salmon PSC limits for the GOA non-pollock groundfish trawl CV sector, the fishery has continued to display variable levels and unpredictable timing of salmon encounter. Potential closures and PSC encounter rates that vary from year-to-year or even week-to-week create uncertainty for fishery participants, which in turn can exacerbate a "race for fish," make business planning more difficult, or directly lead to forgone harvest opportunities. Those outcomes adversely affect trawl harvesters, crew, processors, and GOA coastal communities.

Relative to what was available when the Council established the PSC limits, new information about the resource and the fishery's rate of salmon encounter has been gathered from salmon genetic identification studies and the expansion of observer sampling onto smaller trawl vessels. Meanwhile, the fishery continues to operate under a limited access management structure where harvesters must compete for a share of the available catch without formalized cooperative tools to minimize PSC. As a result, individual actions to avoid PSC often confer an individual competitive disadvantage. Voluntary collective action is costly to organize, and agreements to stand down from fishing to minimize PSC have not always held.

The proposed action would reconsider Chinook salmon PSC limits for the GOA non-pollock trawl CV sector and/or the Central GOA Rockfish Program CV sector. Alternatives to increase PSC limits are offered in light of new information and multiple years of experience fishing under constraining hard caps in a limited access fishery with variable and unpredictable PSC rates. The action would not modify other existing features of the GOA Chinook salmon PSC limits for non-pollock trawl fisheries such as PSC rollovers from the Rockfish Program CV sector to the limited access CV sector, and NMFS's ability to make in-season Chinook salmon PSC limit reapportionments between certain trawl sectors. The action seeks to find the most appropriate PSC limit for this fishery by considering historical PSC levels and providing a margin that accommodates expected variability, while remaining within previously established outer bounds for annual GOA-wide PSC levels that are not expected to jeopardize the Chinook salmon resource.

Alternatives

Alternative 1: No action

Alternative 2: Increase the Chinook salmon PSC limit for the GOA non-pollock non-Rockfish Program CV sector by:

Option 1: 1,000 fish
Option 2: 2,000 fish
Option 3: 3,000 fish

Alternative 3: Increase the Chinook salmon PSC limit for the Central GOA Rockfish Program CV sector by:

Option 1: 300 fish
Option 2: 600 fish
Option 3: 900 fish

The Council may select either Alternative 2 or 3 or may select both in combination. The Council did not specify whether increasing the base PSC limit for either of these sectors would affect the performance standard and resulting buffer amount for the incentive measure described in Section 2.1, or whether additional PSC that is allocated to the Rockfish Program CV sector would be available for the October 1 "rollover" if unused. The Council may also wish to clarify whether the cap on inseason reallocations of Chinook PSC between GOA trawl sectors (GOA Amendment 103) will increase in proportion to any higher limit that is selected under Alternatives 2 or 3.

Table ES-1 shows the maximum amount of Chinook salmon PSC that could be taken under Alternative 2 during a single year across all GOA trawl fisheries, including the pollock fishery and the non-pollock CV sector. If the Council also selects Alternative 3, the overall PSC limit would increase by up to 900 Chinook.

Table ES-1 Maximum annual GOA trawl Chinook salmon PSC under Alternative 2

	No action	Option 1	Option 2	Option 3
Base PSC Limits	32,500	33,500	34,500	35,500
Base + Non-RP CV Incentive Buffer + CP Incentive Buffer (480)	33,340	34,473	35,607	36,740

Environmental Assessment

Groundfish

Under the status quo, groundfish stocks are neither overfished nor approaching an overfished condition. Increased PSC limits are 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. The choice of a lower hard cap option may result in the fishery 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 status quo fishery. If the groundfish TACs are not fully harvested, fishing will have less impact on the stocks, and there will be no adverse impact on the groundfish stocks from the fishery. Any changes in fishing patterns that may result from the alternatives, however, would be monitored and updated in future stock assessments.

Chinook salmon

The non-pollock trawl fisheries have an adverse impact on Chinook salmon through direct mortality due to PSC. Under the status quo, the annual hard cap PSC limit for the Western and Central GOA non-pollock trawl fishery is 7,500 Chinook salmon. Chinook salmon are a prohibited species, and it is incumbent upon fishermen, under the regulations, to avoid catching Chinook salmon. From 2003 through

2017, the average PSC for the non-pollock trawl fisheries was 5,572 Chinook salmon. In 2017, the non-pollock trawl fishery recorded 3,408 Chinook salmon PSC. The years with the highest Chinook salmon PSC during this time period were 2003, 2010, and 2017 with catches of 10,967, 9,853, and 10,389 Chinook salmon, respectively (NMFS Alaska Region Catch Accounting System, January 2018).

Since 2007, there have been poor or below average Chinook salmon runs in Western Alaska. In 2016, runs improved for the Westward stocks (i.e., Yukon, Kuskokwim, and Nushagak) but overall these runs are still below the long-term average. Runs also improved in Kodiak and Cook Inlet in 2016, but still, compared to the long-term average, their overall runs are still below average. Unfortunately, Chinook salmon runs from the Copper River to southern Southeast Alaska have declined and in 2016 the runs there were the lowest on record.

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 the inability to discern and accurately describe small scale impacts on particular individual stocks; nonetheless, we understand that increasing PSC limits could increase the potential to impact salmon stocks in the aggregate. However, there is no evidence to indicate whether the groundfish fisheries' take of Chinook salmon is, or is not, causing escapement failures in Alaska rivers.

The options under each of the alternatives would establish an increased upper limit on the PSC of Chinook salmon in the GOA non-pollock trawl fisheries in the Western and Central GOA. This limit would represent an upper threshold of Chinook salmon PSC in the GOA non-pollock trawl fisheries, as the non-pollock trawl fisheries will be closed when the limit is reached. The PSC limit and potential salmon savings in years of higher Chinook salmon PSC do 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 affected by some other source of natural or fishing mortality. We now have better information about stock composition of Chinook salmon caught in GOA trawl fisheries relative to the last analysis for Amendment 97 (see Guthrie et al. 2017), however, insufficient data are available to assess (a) how many of the intercepted salmon were likely to have returned to their streams as adults, and (b) to which river system or region they would likely have returned. It is not possible to estimate the proportion any stock has contributed to the Chinook salmon PSC. Therefore, our ability to assess the impacts of reducing salmon PSC on salmon populations is constrained.

While it is not possible to assess the impacts to individual Chinook salmon stocks that are being taken in the GOA non-pollock trawl fisheries, it is nonetheless possible to develop general conclusions for the action that is being proposed. If Chinook salmon PSC is increased in some years as a result of this action, it may impact Chinook salmon stocks, and the harvesters and consumers of Chinook salmon, compared to the status quo. Because we do not know the relative abundance of specific stocks in the GOA non-pollock trawl fisheries PSC; however, it is not possible to determine which individual stocks are likely to be affected, nor to what degree.

If the attainment of the PSC limit 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. The extent of any redistribution of effort is difficult to predict and will depend not only on the distribution of Chinook salmon PSC rates on the fishing grounds and the participants' ability to accurately estimate Chinook salmon PSC 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.

Under Alternatives 2 and 3, Chinook salmon PSC may increase slightly from the status quo. Any impact to the Chinook salmon stocks as a whole is likely to represent either no change from the status quo or to cause minor impact, as PSC levels either remain the same or are slightly increased. None of the options considered under Alternatives 2 or 3 would have a significant adverse impact to Chinook salmon stocks.

Other Resource Components

Under the status quo, marine mammal and seabird disturbance and incidental take are at low levels and are mitigated by seasonal and spatial restrictions on the GOA non-pollock trawl fisheries. Under the alternatives, disturbance or incidental take is not expected to increase to a level that would result in population level effects on marine mammals or seabirds. In years where the PSC limit constrains fishing, the chosen limit may reduce the potential effects of the fishery on prey availability. If the fleet spends longer time fishing in areas with lower catch rates to avoid salmon, there may be some increase to benthic habitat impacts and potential removals of marine mammal and seabird prey. However, this increase is unlikely to result in population level effects.

Previous analyses have found no substantial adverse effects to habitat in the GOA caused by fishing activities (NMFS 2005; NPFMC and NMFS 2017). A more constraining hard cap may reduce any effects on habitat that are occurring under the status quo; however, any effects continue to be limited by the amount of the groundfish TACs and by the existing habitat conservation and protection measures. Overall, the combination of the direct, indirect, and cumulative effects on habitat complexity for both living and non-living substrates, benthic biodiversity, and habitat suitability is not likely to be significant under either alternative.

Regulatory Impact Review

Alternative 1

Selecting the No Action alternative would maintain status quo Chinook salmon PSC limits for GOA non-pollock trawl CV fisheries. The RIR considers the impact of the existing Chinook PSC limits on social and economic benefits across GOA non-pollock trawl CV harvesters, processors, and communities, as well as the Chinook salmon resource and its users. The status quo PSC limits were established in the preferred alternative for GOA Groundfish FMP Amendment 97 (NPFMC 2014). As such, the broad effects of selecting Alternative 1 are similar in nature to the effects described in that analysis.

The most obvious effect of a PSC limit on the GOA non-pollock trawl CV sector is the potential to close a fishery prematurely. An early closure affects vessel revenues and crew compensation in a manner that reverberates throughout stakeholder communities. Hard cap PSC limits are a blunt tool in terms of incentivizing participants to minimize Chinook salmon PSC at all times in the context of a competitive limited access fishery, where actions to avoid salmon – such as standing down, relocating, or employing a net excluder device – are individually costly but benefit the fleet as a whole by decreasing the likelihood of a closure. The Council has set PSC hard caps with dual-objectives in mind: preventing PSC from exceeding established conservation goals and supporting the regulated fishery and its dependent stakeholders at historic levels of participation. In selecting the status quo PSC limit for the fisheries affected by this action, the Council intended to select a limit that supported the non-pollock trawl sector's historical PSC use over an average of years but did not select a level that covered the highest years in order to incentivize bycatch minimization. The purpose and need for this action notes that new information from observer coverage that was not available during the years analyzed for Amendment 97 might indicate that estimated Chinook PSC for that segment of the fishery was lower than the actual rate

that supported historical harvest levels. Though it is not possible to retrospectively prove or disprove that smaller trawl vessels had been encountering more Chinook salmon than was estimated based on PSC rates extrapolated from larger Western and Central GOA trawl CVs, the marked increase in maximum estimated Chinook PSC for that sector post-restructuring warrants consideration.

Retrospective analysis of annual harvest and PSC distribution throughout the years since the hard cap was implemented and the observer program was restructured suggest that a PSC closure is not expected befor the end of March. This means that direct harvest and revenue impacts on the non-pollock fishery would not occur in the Western GOA non-pollock CV sector. The impact of a PSC closure hinges on whether or not the Central GOA Pacific cod B season fishery and the late-year Central GOA flatfish fisheries can remain open. Those fisheries account for roughly 23% of harvest and 24% of ex-vessel revenues in the non-pollock non-Rockfish Program CV fisheries. A closure that occurs in April or May could preclude as much as 60% of average annual harvest and revenue. A closure that occurs during the summer months has a modest marginal impact relative to any other closure that falls after the Pacific cod A season.

The Rockfish Program fishery is fully observed, cooperatively managed, and represents a smaller, more interconnected fleet compared to the GOA limited access non-pollock CVs. Stand-downs or cooperative test-fishing to mitigate and adjust to unexpectedly high PSC rates are easier to coordinate. The first two months of the Rockfish Program CV season (May/June) account for 72% of the sector's average annual Chinook PSC, and 66% of its groundfish harvest by weight. Analysis suggest that it is not impossible for the Rockfish Program CV sector to reach its annual PSC limit of 1,200 Chinook, but it is highly improbable for that to occur early in the season.

In addition to any revenue loss associated with forgone non-pollock groundfish harvest, the processing sector might be impacted vis-à-vis its ability to anticipate the need for and utilization of labor, fixed processing costs per unit of production, loss of input supply products to value-added processors in other regions, and fulfillment of output supply contracts. One of the greatest impacts of hard cap PSC limits on processors is uncertainty about the amount and/or timing of groundfish deliveries. Processing workers may be impacted by unexpected lost wages and employment opportunities during times of year when non-pollock groundfish are the only product moving through Central GOA plants.

Limiting the amount of Chinook salmon PSC taken in non-pollock fisheries provides value to commercial Chinook salmon harvesters and processors, consumers, sport fishermen, charter operators, subsistence users, species that prey upon salmon (including ESA-listed species), and salmon stocks that are protected under the ESA. The economic activity generated by salmon harvesting in commercial and non-commercial sectors creates employment and other socioeconomic benefits multipliers throughout coastal communities. Taking fewer Chinook in the trawl fishery represents a benefit to other users of the resource in aggregate, but the direct effect of a marginal "saved" Chinook salmon cannot be quantified; it is not possible to draw any correlation between patterns of PSC and the status of individual salmon stocks. The most recent available data from genetic stock of origin analyses indicates that roughly 80% of the sampled GOA trawl Chinook PSC come from British Columbia and the U.S. west coast; roughly 15% come from Southeast Alaska, and 3% come from Northwest GOA stocks. These proportions only describe the fish that were sampled, and not the entire population of Chinook taken as trawl bycatch.

Alternative 2

The non-pollock non-Rockfish Program CV sector was apportioned the smallest amount of "head room" in its base PSC limit (2,700) relative to its historical PSC use as analyzed when the Council took action on Amendment 97. PSC estimates for the sector in recent years suggest that the sector's expected annual PSC encounter is even closer to the allotted hard cap of 2,700 Chinook salmon. Since the implementation of Amendment 97 in 2015, the sector has recorded Chinook PSC levels of 2,873, 425, and 2,244. Those

widely varying totals, plus the acknowledged risk of a lightning strike PSC event of up to 1,000 estimated Chinook PSC in a week, illustrate the fact that the sector operates in an unstable setting. The analysis also considers the possibility that the true probability of a non-Rockfish Program CV closure in any given year is higher than what was assumed when the existing PSC limit was defined; this consideration is based on the coincidence of expanded observer coverage onto smaller Western GOA trawl CVs and increased PSC levels in that segment of the fleet.

Increasing the sector's base PSC limit would reduce the likelihood of unpredictable closures, providing security to groundfish harvesters, processors, and communities. That security could allow for better business planning, encourage investment in the affected fishery, stabilize the shoreside and at-sea workforce, and reduce uncertainty in an important source of public revenues. The benefits of reducing unpredictability in the frequency and timing of PSC closures are likely to be felt more strongly by stakeholders in the Central GOA fishery, where harvest and revenues continue to accrue later in the calendar when closure is more likely.

The Council should weigh the potential benefits to the trawl sector and its stakeholders against the possibility that higher PSC limits will decrease incentives to avoid Chinook PSC and result in higher bycatch levels relative to the No Action alternative. Chinook salmon provide direct and indirect benefits to a wide range of consumptive and non-consumptive user groups, and that actions that increase Chinook removals represent a marginal adverse impact on those stakeholders.

Alternative 3

Historical annual Chinook PSC levels recorded for the Rockfish Program CV sector are expected to be a strong indicator of annual average PSC levels that can be expected in the future. Average Chinook PSC from 2007 through 2017 was 848 fish, with a low of 158 (2016) and a high of 1,802 (2015). The fact that the highest and lowest PSC levels occurred in consecutive years reflects the supposition that Chinook PSC is unpredictable and that hard caps should account for expected variability, even in cooperatively managed fisheries with secure groundfish species allocations that remove the incentive to race for fish. The sector recorded Chinook PSC levels higher than the status quo PSC limit in three of the 11 years since the Pilot Program was implemented. Moreover, even in the context of a full observer coverage fishery, lightning strike PSC events have occurred.

The sector operates under a PSC limit that is high relative to its historical average use, and it has the operational advantages conferred by cooperative management. As a result, the most likely impact of increasing the sector's PSC limit is that the probability of a PSC closure will marginally decrease while the expected amount of the October 1 PSC rollover to the non-Rockfish sector will increase. Increasing the expected October 1 rollover to the non-Rockfish CV sector is in accordance with the Council's original intent for apportioning the Rockfish sector with a base PSC limit that exceeded its historical average use; an average of 87% of Rockfish CVs participate in Central GOA Pacific cod and/or flatfish fisheries after October 1 on an annual basis.

Actions that increases the amount of Chinook PSC available for use in a given year entail potential adverse impacts on direct and indirect users of the Chinook salmon resource. The level and distribution of those impacts are not quantifiable with available information.