DRAFT FOR INITIAL REVIEW

Preliminary Draft Environmental Impact Statement for Proposed Amendment to the Fishery Management Plan for Groundfish of the Bering Sea/Aleutian Islands Management Area

Bering Sea Chum Salmon Bycatch Management

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Kuskokwim River Inter-Tribal Fish Commission

Tanana Chiefs Conference

Abstract: This preliminary Draft Environmental Impact Statement analyzes proposed management measures to minimize chum salmon (*Oncorhynchus keta*) bycatch in the Bering Sea pollock (*Gadus chalcogrammus*) fishery. The purpose of this action is to minimize chum salmon bycatch in the Bering Sea pollock fishery, with a particular focus on chum salmon of Western Alaska origin, consistent with the Magnuson-Stevens Fishery Management and Conservation Act, its National Standards, and other applicable law. The management measures being considered include limits or "caps" on the number of chum salmon that may be caught in the pollock fishery and closure of all or part of the Bering Sea to pollock fishing once the limit is reached. This document addresses the requirements of the National Environmental Policy Act and other applicable federal law.

For definition of acronyms and abbreviations, see online list: https://www.npfmc.org/library/acronyms

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Executive Summary

This executive summary outlines the Bering Sea chum salmon bycatch preliminary Draft Environmental Impact Statement (DEIS). This preliminary DEIS provides decision-makers and the public with an evaluation of the predicted environmental, economic, and social effects of alternative management measures being considered to minimize non-Chinook salmon prohibited species catch (PSC)[1] in the Bering Sea pollock (*Gadus chalcogrammus*) fishery.

"Non-Chinook" is a category in the National Marine Fisheries Service's (NMFS) Catch Accounting System (CAS). This category includes chum salmon (*Oncorhynchus keta, kangitneq, iqalluk, srughot'aye, dog salmon*)[2], sockeye salmon (*O. nerka)*, coho salmon (*O. kisutch),* and pink salmon (*O. gorbuscha).* Over 99% of the salmon bycatch in the non-Chinook catch accounting category are chum salmon (see Table 6-2). For this reason, the preliminary DEIS primarily uses "chum salmon" in reference to the non-chinook salmon category for ease of the reader.

The proposed management action would amend the Fishery Management Plan (FMP) for the Groundfish of the Bering Sea and Aleutian Islands Management Area (BSAI) and federal regulations to establish new measures to minimize chum salmon bycatch in the Bering Sea pollock fishery, consistent with National Standard 9 of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and all other National Standards. Bering Sea pollock fishery participants are the entities that would be directly affected by any of the proposed changes to the current regulations managing chum salmon bycatch. Participants in this fishery catch up to 99% of the chum salmon taken incidentally in all BSAI groundfish fisheries (see also Table 3-9).

Lead and Cooperating Agencies

NMFS is the lead federal agency preparing this preliminary DEIS. Three tribal and state entities are participating as cooperating agencies under 40 CFR 1501.8 and 1508.1(g)[3]:

- Alaska Department of Fish and Game (ADF&G)
- Kuskokwim River Inter-Tribal Fish Commission (KRITFC)
- The Tanana Chiefs Conference (TCC)

[1] The Magnuson-Stevens Fishery Conservation and Management Act defines bycatch as fish which are harvested in a fishery but are not sold or kept for personal use including regulatory and economic discards. Certain species are designated as "prohibited species" in the Bering Sea Aleutian Island Groundfish Fishery Management Plan because they are the target of other, fully utilized domestic species and include Pacific halibut, Pacific herring, Pacific salmon, steelhead trout, king crab, and Tanner crab. While bycatch is therefore a broader term, in this document both terms are used to refer to the catch of chum salmon in the pollock fishery.

[2] Traditional names for chum salmon in the Yukon and Kuskokwim regions include iqalleq (Central Yup'ik), nalay (Deg Xinag and Holikachuk), srughot'aye (Upper Kuskokwim Athabascan), nulaga (Koyukon), nuleghi (Middle Tanana), and khii (Gwich'in). These names were shared with Council staff for inclusion in this document by the Kuskokwim River Inter-Tribal Fish Commission and Tanana Chiefs Conference, and additional traditional names for chum salmon provided by these entities can be found in Appendix 7 and Appendix 8. However, Alaska is home to 229 sovereign Tribal governments and 23 distinct Alaska Native languages, many of which have multiple dialects and all of which are official languages of the state. Additional Alaska Native languages' names for chum salmon were not included here because, recognizing the importance of language accuracy to respect culture, language-bearers, and Traditional Knowledge systems, Council and NMFS staff as non-Alaska Native language speakers sought to do no harm by attempting to interpret all traditional names for chum salmon. More information on Alaska Native languages is available at the Alaska Native Knowledge Network, and on respectfully working with Alaska Native languages in the Alaska Public Interest Research Group's Alaska Native Language Translation Protocols available here.

[3] This preliminary DEIS cites to the NEPA regulations issued by the Council on Environmental Quality ("CEQ") at 40 CFR Ch.V, subch. A. The recent decision by the D.C. Circuit in *Marin Audubon Soc. v. FAA,* No. 23-1067, 2024 WL 4745055 (D.C. Cir. Nov. 12, 2024), ruled that CEQ lacks the authority to issue binding regulations on NEPA compliance. No other circuit has issued a similar ruling invalidating CEQ's NEPA regulations. This preliminary DEIS refers to and follows the CEQ regulations as advisory, if not binding. This document is also consistent with the statutory requirements under NEPA and does not depend on the validity of the regulations issued by the CEQ.

The MSA is the primary law governing federal fisheries management. The management of marine fishery resources within the nation's Exclusive Economic Zone (EEZ) in federal waters 3 to 200 nautical miles from shore is vested in the Secretary of Commerce (Secretary) and in eight Regional Fishery Management Councils. In the Alaska Region, the North Pacific Fishery Management Council (Council) is responsible for preparing FMPs and FMP amendments, such as the one being considered in this preliminary DEIS for chum salmon bycatch management. The Council is not a federal agency but submits its management and conservation recommendations to the Secretary. If the recommendations are approved by the Secretary, NMFS is the federal agency charged with carrying out the mandates of the Department of Commerce with regard to marine and anadromous fish.

Bering Sea Pollock Fishery

Pollock are a species of fish broadly distributed throughout the North Pacific with the largest concentrations found in the eastern Bering Sea. The Bering Sea pollock fishery is the largest U.S. fishery by volume—the 2024 and 2025 Bering Sea subarea total allowable catch (TAC) was set at 1.30 million and 1.375 million metric tons (mt), respectively. The TAC is set annually through the Council's groundfish harvest specifications process and NMFS allocates the Bering Sea pollock TAC among four sectors.

First, 10% of the TAC is allocated to the Community Development Quota (CDQ) Program.[4] After the CDQ pollock allocation is subtracted from the TAC, an amount determined by the NMFS Regional Administrator is further subtracted for the incidental catch of pollock in other groundfish fisheries. This amount is typically around 4% of the TAC. The "directed fishing allowance" is the remaining amount of pollock, and it is allocated to the inshore catcher vessel (CV) sector (50%), the catcher processor (CP) sector (40%), and the mothership sector (10%). The Bering Sea pollock TAC is further divided by two fishing seasons – the A season (January 20 to June 10) and the B season (June 10 to November 1).

The pollock industry is organized under fishing cooperatives, and a purpose of these cooperatives is to further subdivide each sector's pollock allocation among member vessels through private contractual agreements. The cooperatives manage their pollock allocations to ensure individual vessels and companies do not harvest more than their quota of pollock, facilitate transfers of pollock among members, and enforce contract provisions. Ten fishing cooperatives were originally formed: seven inshore cooperatives (although only five are currently active[5]), two cooperatives in the offshore CP sector, and one cooperative in the mothership sector. There were eight cooperatives active in 2024.

Salmon Bycatch in the Pollock Fishery

Pacific salmon are caught incidentally in the pollock fishery. Pollock are caught using pelagic trawl gear which are cone-shaped nets towed through the mid-water column. Salmon in the Bering Sea exist in the same times, locations, and depths as pollock and are thus caught in the nets of fishermen targeting pollock. Of the five species of Pacific salmon found in Alaska's waters, Chinook salmon and chum salmon are most often encountered in the BSAI groundfish fisheries and primarily by the Bering Sea pollock fishery.

NMFS manages all species of salmon as prohibited species in the BSAI groundfish fisheries because they are not the target species and fully allocated for other uses including subsistence, commercial, and recreational fisheries in and off Alaska and Canada. As prohibited species catch, salmon must be avoided as bycatch. NMFS-certified observers are onboard pollock vessels or stationed at shore-based processing plants accepting Bering Sea pollock deliveries. After an observer has identified the species of salmon and

[4] The CDQ Program was established in 1992 to provide economic development opportunities to communities across Western Alaska by facilitating their participation in the BSAI fisheries.
[5] The Arctic Enterprise Association is a cooperative that has not been active since 2008. The Peter Pan Fleet Cooperative was not active in 2024.

collected any scientific data or biological samples, the salmon must be discarded or donated to the Prohibited Species Donation Program (see 50 CFR 679.21(a)(2)(ii)).

The proposed action is focused on minimizing chum salmon bycatch to the extent practicable, but there are several types of management measures currently used to reduce salmon bycatch in the Bering Sea pollock fishery. The Chum Salmon Savings Area is a time/area closure in the southeastern Bering Sea encompassed within the Catcher Vessel Operational Area (CVOA).[6] The boundaries of this time/area closure were based on historically high rates of chum salmon bycatch (i.e., number of chum salmon caught incidentally per mt of pollock). The Chum Salmon Savings Area would close to all trawl fisheries from August 1 through August 31 and remain closed through October 14 if the area-specific cap of 42,000 non-Chinook (i.e., chum salmon) were caught inside the CVOA at any point from August 15 through October 14.[7]

After several amendments to the management measure since 1994, the existing regulations exempt pollock vessels from the restrictions in the Chum Salmon Savings Area if they participate in the Rolling Hotspot System (RHS) for chum salmon avoidance. The pollock fleet voluntarily developed the RHS program for chum salmon in 2001 and it was managed under an Inter-cooperative Agreement. Contrary to the original intent of the Chum Salmon Savings Area closure, chum salmon bycatch rates appeared to be higher outside the area than inside. The RHS program is a bycatch avoidance program whereby area closures are designated in the Bering Sea based upon recent observations of high bycatch. Once areas with high salmon bycatch rates are identified, closures are established by a third-party entity, Sea State, for a period of time and vessels are moved to new fishing grounds. The RHS program for chum salmon avoidance operates during the B season when the fleet encounters the vast majority of chum salmon bycatch (see Figure 1-1). The program is intended to increase the ability of fishery participants to minimize salmon bycatch by giving them more flexibility to move fishing operations to avoid areas where they experience high rates of salmon bycatch.

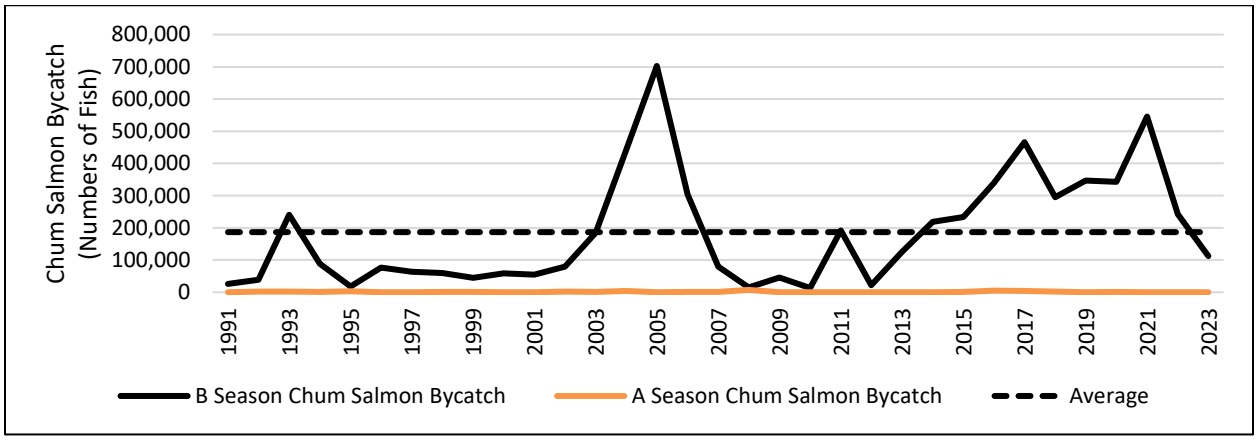

Figure 1-1 Chum salmon bycatch in the Bering Sea pollock fishery for the A season (orange), B season chum salmon bycatch (black), and the annual average level of bycatch (dashed), 1991–2023
Source: NMFS Alaska Region CAS, data compiled by AFKIN.

The RHS program for chum salmon avoidance is now managed under the salmon bycatch Incentive Plan Agreements (IPAs). The IPAs are legally binding civil contracts that establish incentives and penalties for pollock vessels and CDQ groups governed by the contract to avoid Chinook salmon and chum salmon while fishing for pollock. The IPAs were implemented voluntarily in 2010 alongside the Chinook salmon

[6] See 50 CFR 679.22(a)(5). A CP vessel authorized to fish BSAI pollock is prohibited from directed fishing for pollock in the CVOA during the B season, unless it is directed fishing for CDQ pollock.
[7] The non-Chinook salmon PSC limit of 42,000 fish is apportioned among the CDQ and non-CDQ fisheries but not further divided among the sectors.

PSC limit (often referred to as "Amendment 91"). The Chinook salmon PSC limit is a hard cap that requires pollock fishing to cease if the limit is reached. The Chinook salmon PSC limit is divided across the A and B seasons and apportioned among the four sectors. If at least one IPA is approved by NMFS, a PSC limit of 60,000 Chinook salmon is in place. If an IPA is not developed and approved by NMFS, a lower limit of 47,591 Chinook salmon is implemented (see 50 CFR 679.21(f)(2)). These caps decrease in times of low Western Alaska Chinook salmon abundance to 45,000 and 33,318 Chinook salmon, respectively. The Chinook salmon PSC limits also include a performance standard. If a sector exceeds its apportionment of the lower limit for a third year in any seven-year period, it must operate under the lower limit in the future.

Three IPAs have been in place since 2010 and all vessels and CDQ groups have participated in the agreements: the Catcher Processor IPA, Inshore Salmon Savings Incentive Program (Inshore SSIP); and Mothership Salmon Savings Incentive Program (MSSIP). The existing IPA regulations specify 13 different provisions written in broad language to provide IPA members the flexibility to design incentive measures that are responsive to the regulations but work for the unique circumstances of vessels governed by the contract. The IPAs must meet all 13 regulatory provisions, are reviewed by NMFS, and approved after review. As an accountability measure, regulations at 50 CFR 679.21(f)(13) require IPA entities to annually report on their efforts to reduce Chinook and chum salmon bycatch, the effect of incentive measures at the individual vessel-level, how incentive measures impact salmon savings beyond current levels, and more. The written annual reports are made available to the Council, NMFS, and the public prior to March 15 each year.[8]

The Council and NMFS started considering revisions to existing chum salmon bycatch management measures in 2022 following the high bycatch year in 2021. In the 2021 B season, the pollock fleet caught 545,901 chum salmon as bycatch. Compared to the most recent 10-year average (2011–2020) of 258,009 chum salmon, this represented a 112% increase in chum salmon bycatch. Following that high bycatch year, the 2022 B season bycatch was substantially lower at 242,309 fish; the 2023 B season chum salmon bycatch was 111,843 fish; the 2024 B season bycatch was 35,125 fish.[9] The recent decreases in chum salmon bycatch are likely the result of fleet behavioral changes to take additional steps to avoid chum salmon, as well as changes in the distribution and abundance of chum salmon and pollock.

Western Alaska Chum Salmon

The proposed regulatory changes for chum salmon bycatch management in the Bering Sea pollock fishery are being considered in light of the recent declines in chum salmon abundance across Western and Interior Alaska. A general overview of Western Alaska (WAK) chum salmon stock status is provided in Section 3.2.3.1 of this preliminary DEIS. Figure 1-2 provides an index of chum salmon abundance in the Yukon, Kuskokwim, and Norton Sound regions. Abundance levels are standardized and shown as a percentage deviation from the historical average in each area because the unit of measurement for chum salmon abundance is different. Positive percentage deviations indicate years where abundance was above average whereas negative percentage deviations indicate years with below average abundance. As shown, chum salmon abundance was very low across all indices and areas during two distinct periods from 1997–2002 and 2020–present (yellow), indicating that all areas exhibit similar trends during periods of very low abundance.[10] From 2020–2023, Yukon summer and fall chum salmon abundance was 63%–94% below the historical average whereas Yukon fall chum salmon abundance was 74%–90% below average. Chum

[8] IPA annual reports are available on the Council's website.
[9] PSC data are available from the NMFS Alaska Region's Fisheries Catch and Landings Report webpage. Target species catch and PSC data were not finalized for the 2024 fishing year at the time this preliminary DEIS was published. The analysts have included 2024 B season data when relevant for comparison with recent years, based on numbers retrieved on December 8, 2024.
[10] The causes of chum salmon decline in this earlier period are not fully known. In response to these declines, and to improve monitoring and enforcement efforts, the North Pacific Anadromous Fish Commission (NPAFC) scientists developed the Bering-Aleutian International Survey (BASIS) during 2002. BASIS was recently expanded to include other large marine ecosystems in the North Pacific and was renamed the Bering Arctic Subarctic Integrated Survey.

salmon abundance in the Kuskokwim area was 16%–94% below average, and 44%–83% in the Norton Sound region.

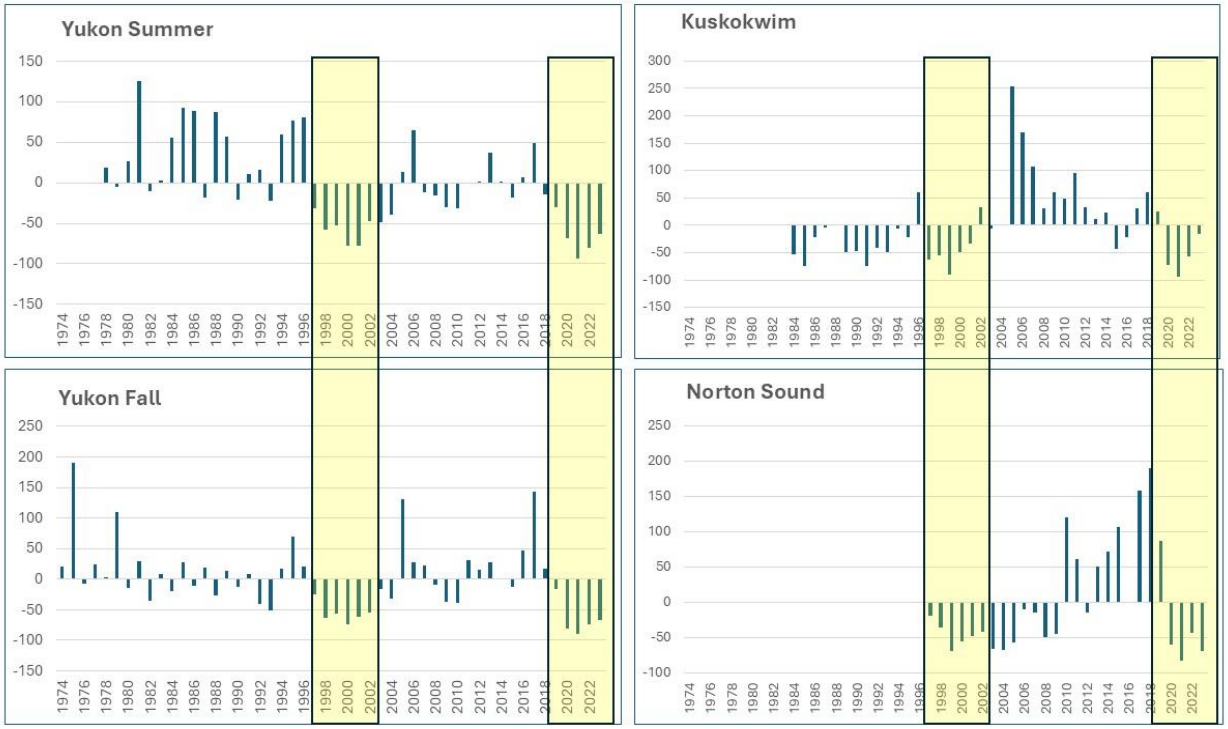

Figure 1-2 Chum salmon abundance in the Yukon, Kuskokwim, and Norton Sound areas measured as a percentage deviation from the historical average level of abundance based on Yukon summer and fall chum salmon run reconstructions, the cumulative catch per unit effort (CPUE) from the Kuskokwim Bethel Test Fishery, and a standardized index of escapements in the Norton Sound region plus total harvest

Source: ADF&G

Chum salmon are harvested for subsistence and non-subsistence uses across Western and Interior Alaska. Many Tribal Nations in these regions have historically relied on chum salmon as an integral component of the subsistence way of life. ADF&G manages subsistence, commercial, personal use and sport salmon fisheries. Subsistence salmon fisheries are managed under a dual state and federal system. This management structure includes a priority for management to first and foremost meet spawning escapement goals in order to sustain salmon resources for future generations. After conservation (escapement), the highest priority use is for subsistence under both state and federal law. Salmon surplus above escapement needs and subsistence uses are made available for other consumptive uses of the stock, such as commercial and sport fishing.

The best available science suggests ecosystem and climate changes are the leading causes of recent chum salmon declines (Farley et al., 2024). Chum salmon originating from WAK river systems spend their first summer in the Bering Sea as juveniles and migrate into the Gulf of Alaska in late fall for their first winter at sea; chum salmon then spend 1–4 more years migrating between the Bering Sea (summer) and Gulf of Alaska (winter) (Myers et al., 2009). In 2016 and 2019, WAK chum salmon were subject to heat waves in both their major marine habitats, which shifted the food web and altered chum salmon diets (von Biela et al., 2019). Juvenile chum salmon were observed to consume less diverse and less nutritious foods (e.g., jellyfish) and exhibited significantly lower energy density (stored energy), presumably because of dietary changes and higher metabolisms associated with warmer ocean conditions. WAK chum salmon that rear in the Bering Sea had not acquired enough energy stores (i.e., fat) prior to their migration and over

wintering in the Gulf of Alaska in the recent warm years, and juvenile salmon abundance has been linked with adult returns (Farley et al., 2024).

Chum salmon taken as bycatch in the Bering Sea pollock fishery reduces the amount of chum salmon that may return to Western and Interior Alaska river systems. As noted above, the proposed regulatory changes are being considered in light of recent declines in WAK chum salmon abundance and the critical importance of chum salmon to Western and Interior Alaska communities and ecosystems (see Section 1.1). The purpose of the proposed action is to reduce chum salmon bycatch in the pollock fishery to the extent practicable with a particular focus on minimizing the bycatch of WAK origin chum salmon.

The chum salmon taken as bycatch in the pollock fishery originate from countries across the North Pacific Rim. Genetic analyses of the chum salmon caught as bycatch organize populations into six genetic stock composition reporting groups: Southeast Asia, Northeast Asia[11], Coastal Western Alaska (CWAK)[12], Upper/Middle Yukon (includes Yukon River fall chum and some Yukon River summer chum salmon populations), Southwest Alaska, and Eastern Gulf of Alaska/Pacific Northwest. The combined WAK chum salmon reporting group includes chum salmon populations in the CWAK and Upper/Middle Yukon reporting groups.

While the exact estimates vary each year, the majority of chum salmon bycatch is attributed to the Northeast and Southeast Asia reporting groups. On average from 2011–2023, approximately 53% of the chum salmon caught as bycatch originate from Northeast and Southeast Asia river systems compared to approximately 19% of the chum salmon bycatch which originates from WAK river systems (see also Table 3-12). Figure 1-3 provides a snapshot of the genetic stock composition estimates for the 2023 B season which is currently the most recent year chum salmon bycatch genetic analyses are available. The 2023 B season bycatch was 111,843 fish, of which 10.6% (11,492 chum salmon) originated from WAK river systems.

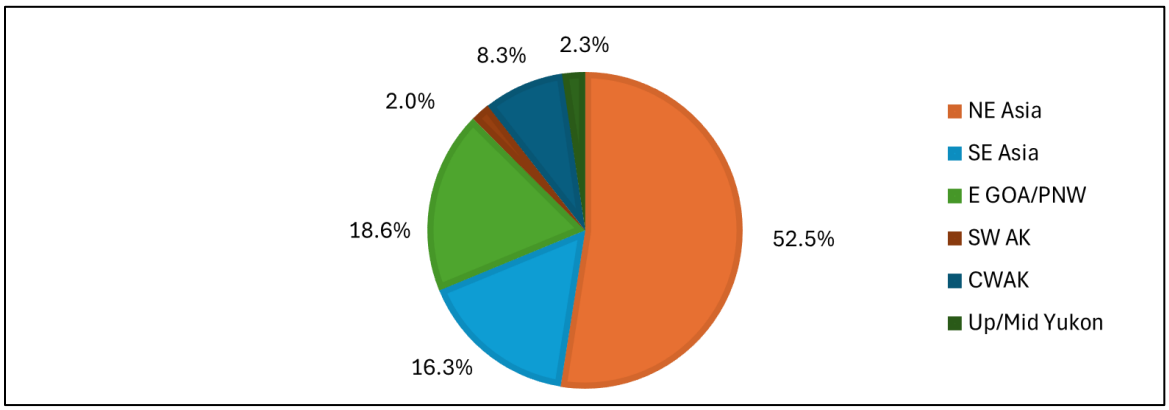

Figure 1-3 Genetic stock composition estimates for chum salmon bycatch in the 2023 B season pollock fishery

Alternatives

The Council recommended the following revised alternatives for analysis in April 2024. Most of the action alternatives (Alternative 2-5) are not mutually exclusive and may be adopted in combination with one another.

Alternative 1: No Action

[11] The Southeast Asia reporting group is primarily composed of hatchery released fish whereas the Northeast Asia reporting group is a mix of hatchery and wild salmon, although the exact proportion of hatchery and wild salmon within the Northeast Asia reporting group is unknown.

[12] CWAK reporting group includes river systems extending from the Norton Sound region in the north south to Bristol Bay.

The National Environmental Policy Act (NEPA) requires a "No Action" alternative be considered. Under the No Action alternative, all regulations and FMP language related to chum salmon bycatch management in the Bering Sea pollock fishery would remain intact. Those regulations include 50 CFR 679.22(a)(10) for the Chum Salmon Savings Area and 50 CFR 679.21(f)(12)(iii)(E) for the salmon bycatch IPAs. Vessels and CDQ groups that are governed by an IPA are exempt from the time/area closure associated with the Chum Salmon Savings Area.

Alternative 2: Overall Chum Salmon PSC Limit

Alternative 2 would establish regulations for an overall chum salmon PSC limit (also referred to as a hard cap) during the B season. Alternative 2 contains different components and options to **1)** determine the total amount of the chum salmon PSC limit and **2)** how to apportion it among the fishing sectors. The PSC limit amount would be chosen from a range of 100,000–550,000 chum salmon (see Table 1-1).

Table 1-1 Range of chum salmon PSC limits in numbers of fish and the Council's rationale

Cap level	Council rationale
100,000	Lower limit added in April 2024 to expand the range of analyzed overall PSC limits
200,000	Rounded up from historical average (1991–2023) intended to balance public testimony requesting a "very low" limit with practicability considerations
300,000	Rounded down from the 10-year average level of bycatch (2013–2022)
350,000	Rounded down from the 5-year average level of bycatch (2018–2022)
400,000	Rounded up from the 3-year average level of bycatch (2020–2022)
450,000	Value between 400,00 and 550,000 chum salmon included in October 2023 addendum
550,000	Rounded value of the highest level of chum salmon bycatch in the analyzed period

The chum salmon PSC limit would be apportioned among the CDQ, CP, inshore, and mothership sectors based upon one of four different approaches: Option 1: 3-year historical average level of chum salmon bycatch; Option 2: 5-year historical average level of chum salmon bycatch; Option 3: a pro-rata approach that weights the amount 25% to the sector's AFA pollock allocation and 75% to the sector's 3-year historical average level of chum salmon bycatch; Option 4: the sector's AFA pollock allocation. Table 1-2 provides the proportion of the cap each sector could expect to receive, based on the four different approaches being considered. The inshore sector's apportionment would be further divided among the inshore cooperatives and open access fishery, when applicable. The CDQ apportionment would be further divided among the six CDQ groups. If a sector reaches its apportionment, it must stop fishing for the remainder of the B season.

Table 1-2 Apportionment percentages for each option by sector

Apportionment options	CDQ	CP	Mothership	Inshore
Sector Apportionment 1, 3-yr avg.	6.1%	21.9%	9.1%	62.9%
Sector Apportionment 2, 5-yr avg.	7.1%	25.2%	9.5%	58.2%
Sector Apportionment 3, pro rata	7.1%	25.4%	9.1%	58.4%
Sector Apportionment 4, AFA	10%	36%	9%	45%

To provide fishing sectors and cooperatives more opportunity to fully harvest their pollock allocations, Alternative 2 would include the ability to transfer chum salmon PSC among sectors and cooperatives, as is allowed under the Chinook salmon PSC limit. A sector would be able to request NMFS move a specific amount of chum salmon PSC from one entity's account to another's during a fishing season. Apportionments of chum salmon PSC do not constitute a "use privilege."

Alternative 3: Overall Chum Salmon PSC Limit With Abundance Indices

Alternative 3 would establish an overall chum salmon PSC limit during the B season based on indices of the prior year's chum salmon abundance. The index framework under Alternative 3 means a chum salmon PSC limit *may* be in place during the B season whereas Alternative 2 includes a chum salmon PSC limit during each B season. The chum salmon PSC limit amount under Alternative 3 could also decrease, depending on the number of thresholds that are not met in a given year. The apportionment options and transferability provisions for Alternative 3 are the same as Alternative 2 and not repeated here. Alternative 3 contains two mutually exclusive options for abundance indices.

Option 1 would implement a Three-area chum salmon index based on the Yukon, Kuskokwim, and Norton Sound regions. The potential management actions are tied to whether the number of chum salmon returning to an area are above or below the threshold. To meet its threshold:

- The Yukon Area needs to have more than 1,713,300 or 2,718,400 combined Yukon summer and fall chum salmon return based on full run reconstructions.
- The Bethel test fishery cumulative CPUE in the Kuskokwim Area needs to be more than 2,800 or 5,200.
- The Norton Sound Area needs to have more than 57,300 or 91,500 chum salmon return based on the sum of the Snake, Nome, Eldorado, Kwiniuk, and North River escapements plus total chum salmon harvests for the region.

At this time, each index has two threshold amounts that represent the 25th or 50th percentile of abundance for each area based on historical data. At implementation, only one threshold would be in effect.

- If all three areas (3 of 3) have returns above their thresholds, a chum salmon PSC limit **would not** be in effect.
- If two areas (2 of 3) have returns above their thresholds, a chum salmon PSC limit **would** be in effect the following year. The amount would be between 100,000–550,000 chum salmon.
- If 1 or 0 (1 of 3 or 0 of 3) have returns above their thresholds, a chum salmon PSC limit **would** be in effect the following year. The amount would be set at 75% of the level selected for when one area (2 of 3) has returns above their thresholds.

Option 2 would implement a hard cap based on indices for Yukon summer and fall chum salmon.

To meet its threshold, the Yukon would need to have:

- More than 1,268,700 or 1,978,400 summer chum salmon return based on the full run reconstruction.
- More than 444,600 or 803,000 fall chum salmon return based on the full run reconstruction.

If both stocks (2 of 2) are above their thresholds, a chum salmon PSC limit **would not** be in effect the following year. If 1 or 0 stocks are above the threshold, a chum salmon PSC limit **would** be in effect the following year. The amount would be between 100,000–550,000 chum salmon.

Alternative 4: Additional Regulatory Requirements for IPAs

Alternative 4 would modify the regulations at 50 CFR 679.21(f)(12)(iii)(E) to include six additional provisions for the salmon bycatch IPAs. The proposed provisions are as follows:

1. Require the pollock sectors to describe in their IPA how historical genetic stock composition data are included in chum salmon avoidance measures.
2. Require the pollock sectors to describe in their IPAs how they monitor for potential chum salmon avoidance closures more than once per week.

3. Require the use of salmon excluders for the duration of A and B season.
4. Require the pollock sectors to develop chum salmon vessel outlier provisions and implement within their IPA.
5. Require IPAs to provide weekly salmon bycatch reports to Western and Interior Alaska salmon users to allow for more transparency in reporting.
6. Require the pollock sector IPAs to prohibit fishing in bycatch avoidance areas for all vessels regardless of performance when ADFG weekly stat area bycatch rates exceed 5 chum per ton of pollock for the CP IPA and 3 times base rate for the Inshore SSIP and MSSIP.

The Council requested the pollock industry to take immediate steps to avoid chum salmon during the 2022 B season. In response, all sectors either made formal amendments or informal agreements to immediately increase chum salmon avoidance efforts. Members of the CP IPA formally amended the contract with new chum salmon avoidance measures in 2022. Members of the Inshore SSIP and MSSIP implemented voluntary measures in 2022 and formally amended their respective IPAs prior to the 2024 B season. The six provisions under Alternative 4 are generally aligned with current fishing operations and reflect the measures incorporated within each recently amended IPA.

Alternative 5: Inseason Corridor Caps

Alternative 5 would establish inseason corridors that would close to a sector if a corridor-specific chum salmon PSC limit is met. Only chum salmon PSC caught inside the corridor from June 10 to August 31 would count towards the cap. Three corridor options are being considered but only one could be selected for implementation (Figure 1-4).

- Option 1: Cluster Area 1 with cap levels ranging from 50,000–200,000 chum salmon
- Option 2: Unimak Area with cap levels ranging from 50,000–200,000 chum salmon
- Option 3: Cluster Area 2 with a cap level of either 50,000–100,000 chum salmon

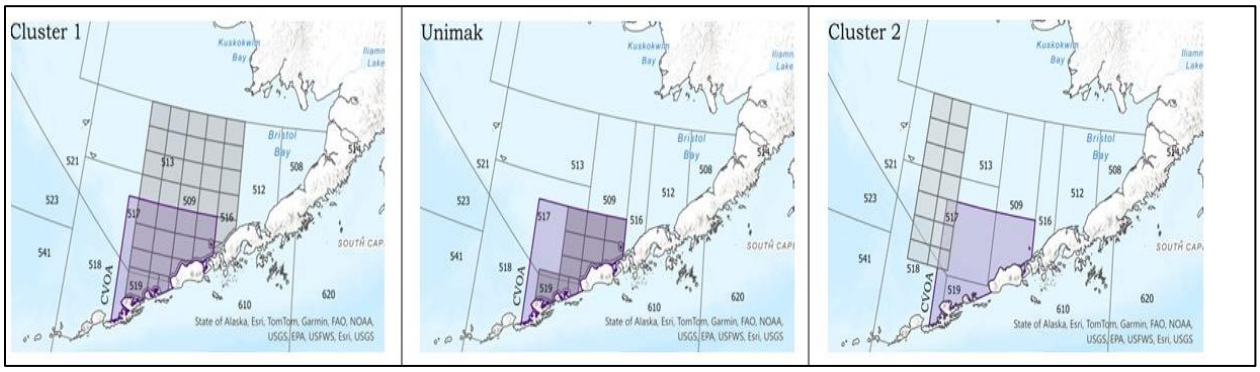

Figure 1-4 Inseason corridor areas under consideration in Alternative 5 (gray) and CVOA (purple)

The apportionment options and transferability provisions are the same as Alternative 2 and 3. Table 2-10 in Chapter 2 provides the apportionment percentages for each sector and inseason corridor based upon each sector's historical chum salmon PSC within the corridor (2011–2023). If a sector reached their apportionment of the cap between June 10 to August 31, the corridor area would immediately close and remain closed until August 31. On September 1, a sector closed out of the corridor area could return and target pollock in the area. The inseason corridors would be managed by NMFS.

Comparison of Alternatives

Table 1-3 below provides a summary and comparison of the primary management features for each proposed alternative.

Table 1-3 Comparison of the primary management tools for each proposed alternative

Alternative	Chum salmon PSC limit	IPA requirements	Western Alaska chum avoidance	Is it a standalone Alternative?
1	Cap of 42,000 non-Chinook closes the Chum Salmon Savings Area (August 1 –31) Vessels and CDQ groups are exempt from the closure if governed by an IPA	RHS system for chum avoidance operates in the B season	RHS closure areas are largest East of 168 degrees West Longitude (closer to Alaska Peninsula) Thresholds for implementing closures are lower in June and July when WAK chum encountered in higher proportions	Yes
2	Hard cap of 100,000 to 550,000 chum salmon closes the fishery if it is met All non-Chinook salmon encountered in B season count to the cap	Same as Alt 1	Same as Alt 1	Yes Could be implemented with Alt. 4 and 5 Could not be implemented with Alt. 3
3	Hard cap in place if one or more Management Areas in Western Alaska are at low abundance Cap level could decrease as more areas fail to meet abundance thresholds	Same as Alt 1	Same as Alt 1	Yes Could be implemented with Alt. 4 and 5 Could not be implemented with Alt. 2
4	Same as Alt 1	Add six provisions with more specificity to existing IPA regulations	RHS closures assessed for the likelihood of the area having higher proportions of Western Alaska chum salmon	Yes Could be adopted with any other action Alternative
5	Cap of 50,000–200,000 chum salmon close corridors when cap is reached	Same as Alt 1	Corridors are in areas where Western Alaska chum salmon have historically been encountered in higher proportions	Yes Could be adopted with any other action Alternative

Impact Analysis

Background

A purpose of this preliminary DEIS is to characterize the conditions that have existed while the current chum salmon bycatch regulations have been in place and to evaluate expected changes due to the proposed alternatives. In this analysis, the terms "baseline," "status quo," and "current" are often used interchangeably to describe this period. The analytical baseline informs decision-makers of the state-of-the-world as it is today, and what could be expected to continue if Alternative 1, No Action is selected. This assessment does not mean the conditions are static; they can always change moving forward.

The analytical baseline is the benchmark used to compare the relative differences in the alternatives, as well as their implications as either positive or negative and their magnitude, against. The analysis must provide an assessment of the direct, indirect, and cumulative effects of the proposed alternatives. Below are definitions for these three categories of effects to provide the reader the appropriate context for understanding how the analysts have characterized the potential impacts (see 40 CFR 1508.1).

- **Direct effects:** impacts caused by the action and occur at the same time and place;
- **Indirect effects:** impacts caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable; and
- **Cumulative effects:** impacts that result from the incremental effects of the action when added to effects of other past, present, and reasonably foreseeable actions regardless of what agency or person is undertaking those other actions.

Chapter 3 of this preliminary DEIS analyzes the potentially affected environment and the degree of the impacts of the alternatives on the various resource components. Since the primary regulatory changes being considered here are management alternatives to reduce chum salmon bycatch in the pollock fishery to the extent practicable, with a particular focus on reducing the bycatch of WAK origin chum salmon, this preliminary DEIS is particularly focused on the effects of the proposed alternatives to chum salmon. The potential impacts to Chinook salmon PSC, herring PSC, eastern Bering Sea pollock, marine mammals, seabirds, habitat, and the ecosystem are also evaluated.

Chapter 4 analyzes the potential economic and social impacts of the proposed alternatives on participants in the Bering Sea pollock fishery, as well as communities and Tribes that rely on WAK chum salmon fisheries for economic wellbeing, food security, and the subsistence way of life. Fisheries management and enforcement as it relates to the pollock fishery was also evaluated (see Chapter 6).

The proposed alternatives create different incentives for chum salmon avoidance. Considering the incentives created by the alternatives, and how the pollock industry may respond to them, is an important component to this analysis. The potential future behavior changes would influence the magnitude of bycatch reductions as well as the potential for unintended, adverse effects. Compared to the status quo, chum and WAK chum salmon bycatch reductions could result from either an early B season closure that would ensure no additional PSC was removed in that year (**Alternatives 2 and 3**), behavior changes to stay below the overall PSC limits (**Alternatives 2, 3, and 5**), and/or fleet movement away from areas with high chum salmon bycatch rates or encounters (**Alternatives 4 and 5**). As the pollock industry works to avoid chum and WAK chum salmon bycatch in response to one or more of the alternatives, there could be interactions with other PSC species like Chinook salmon and herring. Figure 1-5 shows the incentive structures around each of the proposed alternatives.

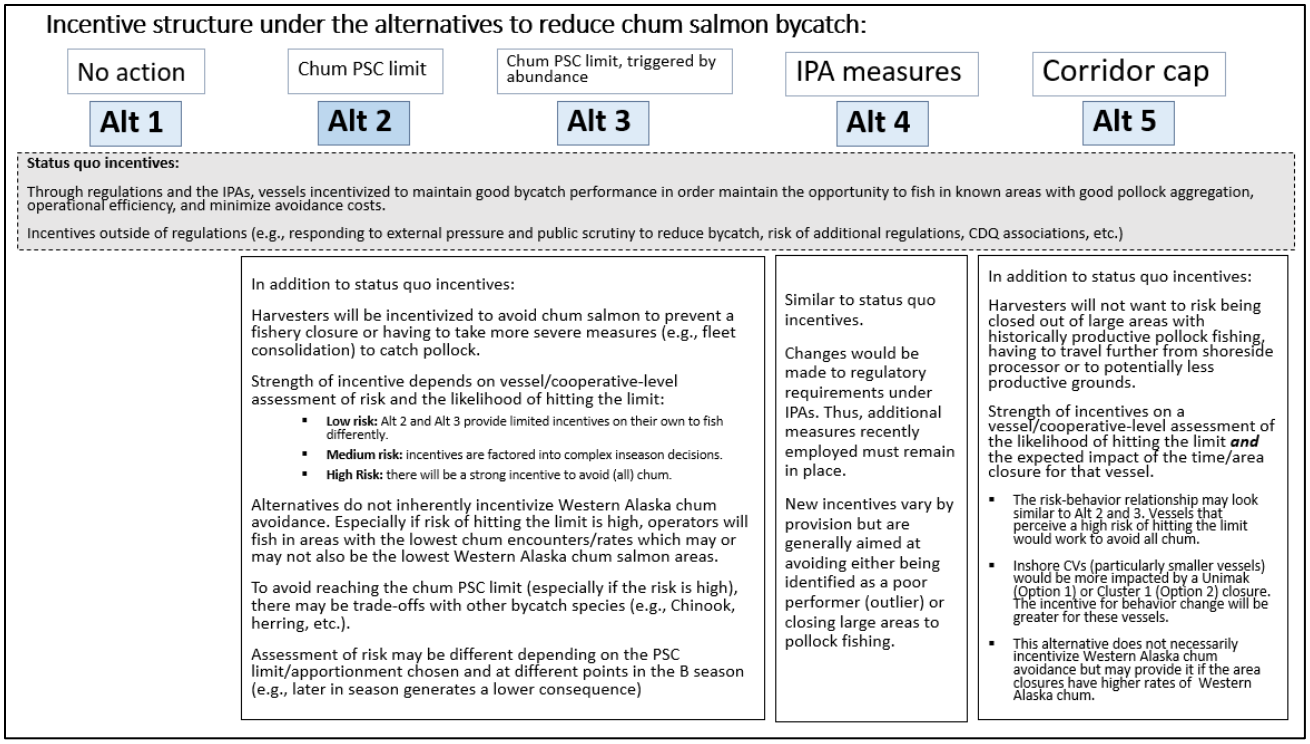

Figure 1-5 Incentive structure under each alternative

Pollock Stock

The eastern Bering Sea pollock is currently managed to account for the capacity of the stock to yield sustainable biomass on a continuing basis, and this stock is not overfished nor approaching an overfished condition (Section 3.1.1.1). Analysis of Alternatives 2, 3, and 5 indicates these alternatives could make it more challenging to catch the full B season TAC and thus reduce the impact of fishing on the pollock stock. However, these alternatives are likely to result in fishermen shifting where they fish for pollock to avoid chum salmon bycatch. Changes in where pollock fishing would occur is likely to be within the historical footprint of the fishery. As such, the proposed alternatives would be expected to have a neutral effect on the Bering Sea pollock stock when compared to the status quo.

Chum Salmon

Alternative 1 would not change the regulations managing chum salmon bycatch in the Bering Sea pollock fishery (see Section 2.2), nor would this alternative modify any regulation for Chinook salmon bycatch under the current bycatch management program (see Appendix 2). From 2011–2023, an average of 267,704 chum salmon were caught as bycatch in the B season pollock fishery, ranging from a low of 111,843 fish in 2023 to a high of 545,901 fish in 2021. The 2024 B season bycatch of 35,125 chum salmon was well below average (2011–2023).

Not all chum salmon caught as bycatch originate from WAK river systems. WAK chum salmon populations are organized into two genetic reporting groups, CWAK and Upper/Middle Yukon. As noted above, the CWAK reporting group includes chum salmon returning to natal river systems from Kotzebue Sound to Bristol Bay whereas the Upper/Middle Yukon reporting group largely aligns with the fall chum salmon stock. The proportion of the total bycatch attributed to WAK chum salmon stocks (CWAK + Upper/Middle Yukon) ranged from 9.1% of the total in 2020 to 24.6% of the total in 2016. On average, chum salmon originating from WAK river systems accounted for 18.6% of the total bycatch (2011–2023).

While the proportion of WAK chum salmon in the total bycatch varies each year, there are some spatial and temporal patterns that indicate when and where WAK chum salmon are more likely to be encountered on the pollock fishing grounds. Figure 1-6 shows "cluster areas" used by geneticists at the Alaska Fisheries Science Center's (AFSC) Auke Bay Labs (ABL) to show spatial variation in the genetic stock composition estimates for chum salmon bycatch. The cluster areas are simply groupings of ADF&G groundfish statistical areas (stat areas), into four larger clusters. Historical genetic analyses indicate WAK chum are more likely to be encountered in higher proportions near the Alaska Peninsula (Cluster 1 in orange) compared to fishing grounds further northwest and during June to August relative to later months during the B season.

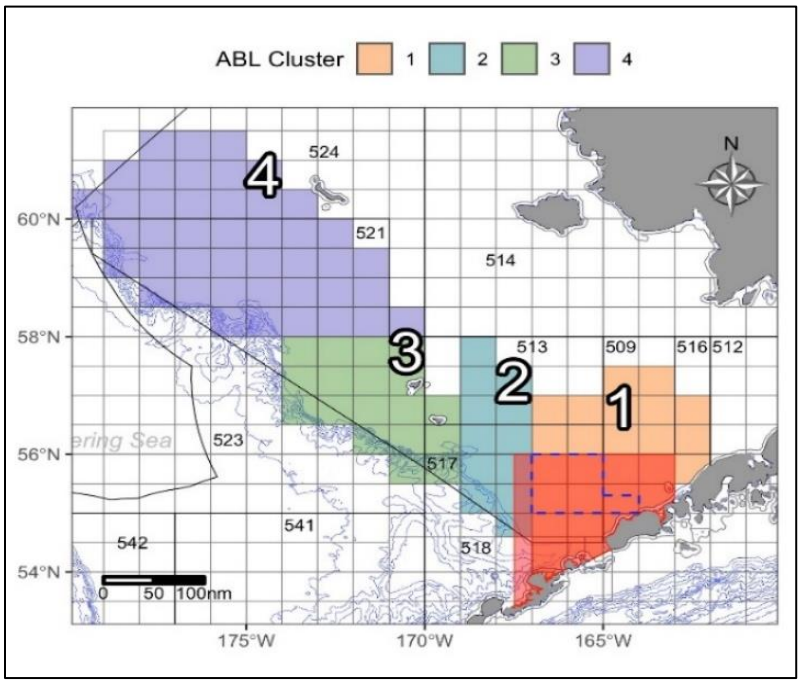

Figure 1-6 Map of four genetic cluster areas as well as the CVOA (red) and Chum Salmon Savings Area (blue dotted line)

Chum salmon bycatch genetics data were combined with data on the ages of chum salmon taken by the pollock fishery to provide annual estimates on the numbers of chum salmon that would have otherwise survived the marine environment and returned to natal river systems to spawn or be caught in a directed fishery (referred to as an adult equivalency analysis or AEQ[13]). The adult equivalency analysis was completed for the CWAK and Upper/Middle Yukon reporting groups using data from 2011–2022.[14] Estimates on the number of AEQ CWAK chum salmon in the bycatch ranged from 11,608 fish in 2012 to 69,445 fish in 2017 and estimates on the number of AEQ Upper/Middle Yukon chum salmon ranged from 2,124 fish in 2020 to 16,429 fish in 2017.

An adult equivalency analysis for chum salmon caught as bycatch is not a complete impact analysis, which requires an estimate of total run size to determine the potential effects of bycatch on these populations. Run reconstructions for all major salmon producing river systems across coastal WAK are not available. Nevertheless, the estimates of the number of AEQ CWAK chum can be compared to total removals of subsistence and commercial chum salmon harvests in the Kotzebue, Norton Sound, Yukon summer chum, Kuskokwim, and Bristol Bay areas. On average from 2011–2019, bycatch removals of

[13] While an AEQ analysis can provide a more accurate representation of the actual impact that chum salmon bycatch in the pollock fishery may have on total run size, it may not capture the relative importance of a small number of fish for Western and Interior Alaska ecosystems, and the fishermen, communities, and Tribes that depend on chum salmon, as noted in Appendix 7 and 8 provided by KRITFC and TCC, respectively.

[14] Age data are not available for the 2023 chum salmon bycatch.

AEQ CWAK chum salmon in the pollock fishery accounted for 1.4% of total removals of CWAK chum salmon. Removals of AEQ CWAK chum salmon due to bycatch represented a higher proportion of total removals in recent years of low abundance at 5.7% from 2020–2022, on average.

The Upper/Middle Yukon reporting group aligns with the Yukon fall chum salmon run, which is a genetically distinguishable stock for which a run reconstruction is available. The impact rate of bycatch on the Upper/Middle Yukon reporting group fluctuated annually from 2011–2022 averaging 1%. The largest impact was observed in 2021 at close to 5%.

For **Alternative 2 and 3,** estimates on the potential number of chum salmon saved under each alternative compared to Alternative 1 (status quo) are made based upon catch and bycatch data from 2011–2023. Catch data are compared to the details of the alternative and option to determine when a cap would have been met and triggered a closure. Based on that date, an estimate was made on the amount of pollock (mt) that would have been unharvested ("forgone pollock") and the reduction in the amount of chum salmon bycatch ("salmon savings").

A subset of three hard caps were used to display estimates throughout the analysis. These amounts represent the upper and lower endpoints of the range as well as one equidistant point: 100,000 chum salmon; 325,000 chum salmon; and 550,000 chum salmon. A 75,000-chum salmon PSC limit was also included for the analysis of Alternative 3, Option 1 because it is the lowest possible cap amount under consideration (Alternative 3, Option 1 when fewer than two areas have returns above threshold values). This approach provides an analysis of the full range of potential impacts that could result from selecting a PSC limit under Alternative 2 or 3. However, the Council may recommend a chum salmon PSC limit anywhere within the range specified (100,000–550,000 chum salmon).

For Alternatives 2 and 3, all options under consideration could reduce chum salmon PSC compared to Alternative 1. However, the caps being considered for Alternative 2 would have little potential to impact annual bycatch amounts in years with low historical bycatch. The lowest year of bycatch in the analyzed period was 2012, and all analyzed caps were estimated to have had no effect on PSC reductions compared to status quo. On the other hand, estimates on the number of chum salmon saved are high in some years and vary by sector. For instance, the highest potential for chum salmon bycatch reductions to accrue from a single year and sector would have occurred in 2021 under a 100,000-chum salmon PSC limit using the AFA apportionment. This could have resulted in 289,446 chum salmon not caught by the inshore sector.

A PSC limit of 100,000 chum salmon would have closed fishing for all sectors in a varying number of years depending on the apportionment used. This cap would have ended the B season early for the CDQ sector in 5–6 years, in 10–11 years for the CP sector, and in 10 and 12 years for the mothership and inshore sectors, respectively. The highest chum salmon PSC reductions from the pollock fleet were estimated under a 100,000-chum salmon PSC limit using the pro-rata apportionment for Alternative 2. In percentage terms, this cap amount and apportionment were estimated to reduced fleet-wide chum salmon PSC by 56.4% across all years.

As the PSC limit is increased to 325,000 fish, the estimates on PSC reductions are lower than those predicted at a limit of 100,000 chum salmon, and the cap halts operations in fewer years for all sectors (see Figure 1-7). Across all years, at a 325,000-chum salmon PSC limit, the highest fleet-wide chum salmon PSC savings would occur under the 3-year average apportionment This cap amount and apportionment represented a 12.4% reduction from status quo across all years. Higher savings are estimated from the 3-year average apportionment under a 325,000-chum salmon PSC limit because the CP and CDQ sectors had higher bycatch in some years (e.g., 2017) and the 3-year average apportionment option is the most restrictive for these sectors (compared to other apportionment). Similar trends are observed as the PSC limit increases to 550,000 chum salmon.

The salmon savings estimates shown in Figure 1-7 do not account for oceanic mortality and varying age at maturity and thus represent chum salmon that would not be caught as bycatch, but not necessarily fish that would return to their regions of origin.

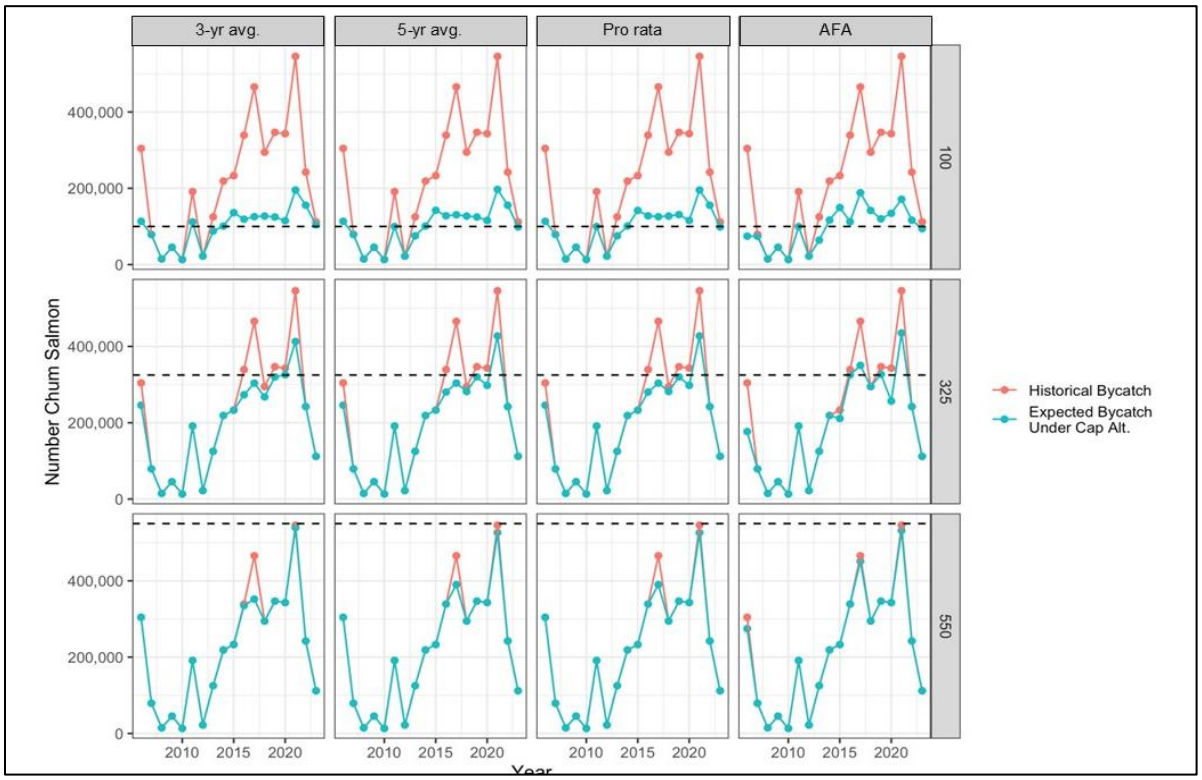

Figure 1-7 Historical B season chum salmon bycatch (red line) compared to estimated chum salmon bycatch under Alternative 2 PSC limit amounts (blue line) ranging from 100,000–550,000 chum salmon (black dotted line) and all apportionment options

Note: estimated bycatch values above the black dotted line are due to the retrospective method used to estimate early closures.

Since all options being considered under Alternative 2 could reduce chum salmon PSC, they could also increase returns of adult salmon to their regions of origin. The largest AEQ savings from both reporting groups was estimated to occur under a 100,000-chum salmon PSC limit using the pro-rata apportionment. This would have increased returns to CWAK by an average of 21,678 fish and an average of 3,435 fish to the Upper/Middle Yukon. The highest single year of reductions was estimated to occur in 2017 under a 100,000-chum salmon PSC limit using the 3-year average apportionment at 47,862 fish from the CWAK reporting group and 11,553 fish from the Upper/Middle Yukon reporting group.

Alternative 2 and 3 are mutually exclusive, so only one alternative could be selected for implementation. **The potential year-over-year savings for Alternative 3, Option 1 or 2 are less than what would be expected for Alternative 2 but would still be a decrease in bycatch from status quo.** Under this management framework, a PSC limit would have been in place in either 3 or 6 years under Alternative 3, Option 1 (Three-area index) and either 4 or 5 years under Alternative 3, Option 2 (indices based on Yukon summer and fall chum salmon). In years when a chum salmon PSC limit would not have been in place, the potential impacts to chum salmon PSC are best approximated by the status quo. However, a 75,000-chum salmon PSC limit could have been in effect under Alternative 3, Option 1 in 2021, 2022, and 2023 as more than two areas had run sizes that failed to meet their thresholds in the prior year. In these three years, for most sectors and apportionments, the potential chum salmon PSC reductions were estimated to be marginally greater than what could be expected in the same years under Alternative 2.

However, there is a degree of uncertainty in whether WAK chum salmon PSC would be reduced under the hard caps being considered under Alternatives 2 and 3. The analysis expects pollock

fishermen would go to areas with good pollock aggregations and low chum salmon bycatch rates while balancing other considerations to avoid reaching the overall cap. The fleet may be able to use different strategies to stay below an overall cap, such as increased movement, communication, or test tows, but this would not necessarily result in lower WAK chum salmon bycatch. As an example, the 2022 B season bycatch of 242,309 chum salmon was a 55% reduction from the 2021 B season bycatch of 545,901 chum salmon. Despite this decrease in the overall bycatch in 2022, the estimated number of WAK chum salmon caught as bycatch in the 2022 B season was 55,724 chum salmon compared to 51,512 WAK chum salmon in the 2021 B season. This represented an 8% increase in WAK chum salmon bycatch. Reducing chum salmon bycatch to the lowest levels observed in the time series could reduce the number WAK chum salmon caught as bycatch in the pollock fishery (e.g., 2012, 2013, and 2023), but the proportion of WAK chum salmon in the total bycatch would still be variable. Potential reductions in WAK chum salmon bycatch would also depend on fishing behavior, overall chum salmon bycatch encounters, and the proportion of WAK chum salmon encountered in a given year.

The provisions being considered under **Alternative 4** were evaluated for its likelihood to reduce chum salmon and WAK chum salmon PSC in Section 3.2.4.3. The voluntary amendments to the IPAs have coincided with lower levels of chum salmon PSC in recent years. Compared to the 2021 level of bycatch of 545,901 chum salmon, the 2022 B season bycatch was a 55% reduction, the 2023 B season an 80% reduction, and the 2024 B season was a 94% reduction. The analysis cannot quantify and attribute the PSC reductions that may have been achieved by the IPAs incorporating measures that reflect these proposed provisions in recent years. However, without modifying the existing regulations to require these measures continue to be used in the future, it would be possible for the contracts to be modified such that less stringent avoidance efforts are taken.

Alternative 5 includes three different options for inseason corridors that would close to a sector if the corridor-specific PSC limit was met at any point between June 10 through August 31. The timing and location of these corridors was informed by historical salmon bycatch genetic analyses indicating WAK chum salmon are more likely to be encountered in higher proportions during earlier in the B season and closer to the Alaska Peninsula. In the most recent five years (2019–2023), the average proportion of WAK chum salmon in the total bycatch during June to mid-August (referred to as "Early period") was approximately 19%, 22%, and 11% in Cluster 1, Unimak, and Cluster 2, respectively. The average proportion of WAK chum during mid-August to November 1 (referred to as "Late period") in the corridors was approximately 19%, 18%, and 10% in Cluster 1, Unimak, and Cluster 2, respectively.

The impacts to chum and WAK chum salmon bycatch due to a corridor closure are uncertain because this alternative would displace fishing effort to outside locations and there are inherent limitations to predicting where pollock fishermen would go. The magnitude of potential bycatch reductions under each corridor and cap are based on each sector's historical bycatch inside the corridor, as well as what the bycatch encounters outside the corridors where fishermen move to may be. For instance, the average chum salmon bycatch rate in June and July inside Cluster 2 was 1.92 chum/mt of pollock compared to 0.42 chum/mt of pollock in Cluster 1 and 0.55 chum/mt of pollock in Unimak (2019–2023).

Each pollock sector has different fishing history inside these corridors. The inshore sector, and to a lesser degree the mothership sector, has a high degree of reliance on the Cluster 1 and Unimak corridors. In some years and at lower corridor cap amounts, these corridor closures could displace ~200,000 mt of inshore sector pollock catch. These vessels are limited in how far they can travel to find productive fishing grounds with low bycatch rates due to their processors' delivery requirements among other factors. Many inshore CVs displaced from Cluster 1 and Unimak would likely first move to Cluster 2 which is immediately northwest of these corridors. Some of the larger CVs may travel further. A scenario that concentrates pollock fishing in areas like Cluster 2 with high chum salmon bycatch rates could result in much higher chum salmon bycatch numbers compared to status quo, which could also increase WAK chum salmon bycatch numbers despite a lower proportion of WAK chum salmon in the total bycatch in these areas.

On the other hand, because overall chum and WAK chum salmon bycatch tends to be higher in Cluster 1 or Unimak, if vessels continue to fish in these areas and are able to successfully minimize bycatch compared to status quo, there could be a substantial reduction in chum salmon and WAK chum salmon bycatch. This scenario would have the greatest potential for chum and WAK chum salmon bycatch reductions, but it also has a high risk that those benefits will not be realized and an increase in chum salmon bycatch if vessels are incentivized or required to move into Cluster 2.

When the corridor areas are compared to one another, the analysis indicates implementing a Cluster 2 corridor poses the least risk to creating adverse outcomes for chum and WAK chum salmon bycatch. This outcome is counterintuitive when considering historical chum salmon bycatch genetics data which indicate WAK chum salmon are encountered in higher proportions in the Cluster 1 and Unimak corridors. However, these outcomes are driven by the alternative structure that displaces pollock fishing when the corridor closed, the high amount of pollock harvest that has occurred inside Cluster 1 and Unimak, and the high chum salmon bycatch rates inside Cluster 2.

Table 1-4 Simplified comparison of the potential risks and benefits for chum and WAK chum salmon bycatch associated with Alternative 5

Cap / Corridor	Cluster 1	Unimak	Cluster 2
200,000	Moderate Benefit/Low Risk	Moderate Benefit/Lower Risk (compared to Cluster 1)	N/A
100,000	Moderate Benefit/Moderate Risk	Moderate Benefit/Lower Risk (compared to Cluster 1)	Moderate Benefit/Low Risk
50,000	High Risk/High Benefit ***if cap not met***	High Risk/High Benefit ***if cap not met***	High Benefit/Low Risk

Western and Interior Alaska Chum Salmon Fisheries

The proposed action is being considered in light of the recent and ongoing declines in WAK chum salmon abundance and the critical importance of chum salmon for Western and Interior Alaska ecosystems, communities and Tribes. Recent declines in chum salmon abundance were described above and are not repeated here. **Alternative 1** represents no change to the current chum salmon bycatch regulations and therefore does not have inherent benefits to Western and Interior Alaska ecosystems, subsistence and commercial fishermen, communities and Tribes beyond the status quo.

Subsistence harvests of chum salmon can be affected by conservation efforts for Chinook salmon and other species, weather patterns, households' needs in a given year, and abundance levels. Similarly, commercial chum salmon fisheries participation can be affected by a processor closing or the lack of a buyer as well as abundance. Coinciding with the recent period of decline, subsistence harvests of chum salmon across Western and Interior Alaska have been dramatically low in recent years, and commercial chum salmon fisheries within the Western and Interior Alaska management areas have experienced either closures or declining commercial chum salmon harvest trends in recent years.

Annual average subsistence harvests of chum salmon in the most recent three years (2020–2022) were 72% below the historical average in the Norton Sound region (1994–2019), 97% below the historical average for Yukon fall chum and 84% below the historical average for Yukon summer chum (1988–2019), and 76% below the historical average in the Kuskokwim region (1989–2022). Commercial chum salmon restrictions have been in place for Kuskokwim Bay, Kuskokwim River, Norton Sound, and Kotzebue (2020–2023). Closures have been in place for Yukon River summer chum since 2021 and for the fall run since 2022. The lack of commercial chum harvest in recent years is a stark contrast to

commercial harvests of 576,700 summer chum salmon in 2018 and 489,702 fall chum salmon on the Yukon in 2017.

Declines in chum salmon abundance have had broad and severe implications for Western and Interior Alaska ecosystems, communities, and Tribes. These declines have coincided with declines in Chinook salmon runs and represent a significant loss for many rural and Indigenous communities' ways of life, cultural traditions, and spiritual wellbeing (see Section 4.3.3.2). Families are currently gathering less to use fish camps as many weigh the costs and benefits of traveling to fish during short windows when all of their needs may not be met (Trainor et al. 2021). It is at fish camp that core values like sharing, respect, not wasting, and the kinship relationships with salmon, are passed down to Alaska Native youth of the Yukon and Kuskokwim regions (see Section 4.3.3.2). Reduced opportunities for subsistence and commercial fishing have had a negative effect on households' ability to secure healthy and culturally preferred wild foods with broader effects within and across sharing networks and mixed economies for rural and Alaska Native communities (Wolfe 1982).

All of the proposed action alternatives are different measures to reduce chum salmon bycatch in the pollock fishery to the extent practicable. Relative to status quo, there could be positive and indirect impacts to Western and Interior Alaska chum salmon users. The degree to which the proposed alternatives being considered in this action could indirectly affect Western and Interior Alaska chum salmon users depends on the pollock industry's ability to reduce WAK chum salmon bycatch.

Under Alternative 2, the highest estimate on AEQ chum salmon savings from the Upper/Middle Yukon reporting group would have occurred in 2017 at 11,553 fish. The 2017 Yukon fall chum salmon run was 2,315,583 fish which was well above the drainage wide escapement goal of 300,000–600,000 fish. In 2017, limited subsistence fishing opportunities were provided due to Chinook salmon conservation measures. The lowest year of return for Yukon fall chum salmon was 2021 at 95,249 fish. In 2021, the highest estimate for AEQ Upper/ Middle Yukon savings would have occurred in 2021 under a 100,000-chum salmon cap and the AFA apportionment at 3,255 fish. These estimates indicate the alternative and options may not have changed the outcome for directed fishing opportunities in these years but could have resulted in more chum salmon returning to the river system and generally improved conservation towards meeting escapement goals.

An overall chum salmon PSC limit is expected to motivate changes in fishing behavior prior to a limit being reached, to the extent the sector is able. As such, these values may not represent an upper bound of potential overall savings. An AEQ analysis may also not capture the relative importance of a small number of fish for Western and Interior Alaska ecosystems, and the fishermen, communities, and Tribes that depend on chum salmon, as described in Appendix 7 and 8 provided by KRITFC and TCC. For many Indigenous communities across Western and Interior Alaska hold, their wellbeing is wholistically bound to salmon fishing (see Section 4.3.3.2 and Section 4.4.5.3.3).

Recent reductions in B season chum salmon bycatch have coincided with the implementation of measures in the IPAs aligned with the provisions proposed under **Alternative 4**. The degree to which Alternative 4 could have positive and indirect effects for Western and Interior Alaska chum salmon users depends on industry's ability to avoid WAK chum salmon in the overall bycatch. The individual provisions of Alternative 4 are analyzed in Section 3.2.4.3. Some provisions have the potential to reduce WAK chum salmon bycatch from current levels given the explicit focus on prioritizing hot spot closures when areas are more likely to have higher proportions of WAK chum salmon bycatch.

Alternative 5 could result in varied outcomes for Western and Interior Alaska chum salmon users. When the corridors are compared against one another, prioritizing chum salmon avoidance in Cluster 2 poses the least risk to creating adverse outcomes for chum and WAK chum salmon bycatch as well as Chinook salmon bycatch. It is possible that prioritizing avoidance in the Cluster 1 and Unimak corridors could have the greatest potential for chum and WAK chum salmon bycatch reductions, if vessels continue to fish in these areas and are able to successfully minimize bycatch compared to status quo. There is also a

high risk that those benefits for WAK chum salmon will not be realized if effort is displaced outside these areas. If the corridor caps result in a longer season for the pollock sector, this could also risk increasing Chinook salmon bycatch relative to status quo levels.

To the extent that any proposed alternative reduces WAK chum salmon bycatch from current levels, the management change could increase the likelihood that WAK chum salmon return to their regions of origin with positive impacts towards conservation. Over time, higher abundance could provide more harvest opportunities. Additional flexibility in the timing and duration of subsistence harvesting opportunities could support traditional practices of fishing for chum salmon when they present themselves (see Section 4.3.3.2.1). This may also be more aligned with when fish are in better condition. More broadly, additional opportunities for subsistence fishing would make it more likely that households' harvest goals are met, that Tribal food sovereignty and security is supported, potentially restoring human-salmon-ecosystem relationships (see Section 4.3.3.2.2).

Chinook Salmon PSC

The number of Chinook salmon encountered as bycatch in the pollock fishery varies each year, but bycatch levels have decreased substantially since the hard caps took effect in 2011. From 1991–2010, the annual average Chinook salmon bycatch was 40,876 Chinook compared to 18,325 from 2011–2023. Since 2011, annual Chinook salmon bycatch levels have ranged from 6,337 fish in 2022 to 32,200 fish in 2020. The proportion of coastal Western Alaska Chinook salmon in the total bycatch has decreased from a high of 68.0% in 2011 to a low of 23.7% in 2017 and has since fluctuated around 47% since 2020.

AEQ and impact rate analyses were prepared to estimate the effect of Chinook salmon bycatch removals in the pollock fishery on the Upper Yukon and coastal WAK reporting groups. Bycatch removals of Upper/Middle Yukon AEQ Chinook was estimated to be less than 1% in all years from 2011–2023, except for 2022 when the impact rate was estimated at 1.1% of the total run size. The impact rate for the CWAK reporting group ranged from 1.2% to 3.6% (2011–2023).

The proposed management alternatives to reduce chum salmon bycatch in the pollock fishery would affect fishing behavior, and there could be a wide range of potential interactions with Chinook salmon. The pollock fishery catches both chum salmon and Chinook salmon bycatch during the B season. The timing of this catch is dissimilar amongst the two species, with Chinook salmon caught in the latter part of the B season and chum salmon caught throughout the B season. Additionally, WAK chum salmon bycatch is encountered in higher proportions from June to August compared to the later aspects of the B season (see Section 3.2.4.1.3). Similar trends were also observed inside the corridor areas under consideration Alternative 5.

The salmon bycatch IPA regulations require the IPAs to create incentives to ensure the Chinook salmon PSC rates in October are not significantly higher than those achieved in preceding months (50 CFR 679.21(f)(12)(iii)(E)(*13*)). As such, policy decisions for alternative management measure for chum salmon bycatch must also consider the potential impact on Chinook salmon PSC. A consideration of policy decisions for Chinook salmon bycatch are less relevant for Alternative 4. The pollock fleet has operated under the IPAs since 2010, and the provisions under Alternative 4 largely reflect current operations and thus Alternative 4 is not expected to have adverse impacts on Chinook salmon PSC.

The overall caps under **Alternatives 2 and 3** could close the B season earlier and thus reduce Chinook salmon PSC. A 100,000-chum salmon cap was estimated to reduce Chinook salmon bycatch by an average of 5,404 fish (2011–2023). Caps analyzed at higher amounts within the range for Alternatives 2 and 3 would result in marginal changes to Chinook salmon PSC compared to status quo. At higher cap amounts, there is less potential for early B season closures and the fleet would have greater operational flexibility to avoid Chinook and chum salmon PSC.

If a chum salmon PSC limit slowed the pace of the pollock fishery, it could increase divert pollock catch to later in the B season. This would likely increase Chinook salmon PSC. Chinook salmon bycatch rates

increase as the B season goes on, such that the highest Chinook salmon bycatch rates have occurred in October (NMFS 2009, 2016). As shown in Figure 1-8, the average Chinook salmon bycatch rate in October (statistical weeks 41–44) was 0.10 Chinook/per mt of pollock compared to the average in prior B season weeks at 0.01 Chinook/mt of pollock.

Although the analysis expects the industry would carefully balance operations to avoid Chinook and chum salmon bycatch, adding a second hard cap to the B season would limit operational flexibility. In a scenario where fishermen cannot find consistently good pollock catch rates and lower chum salmon bycatch rates after moving or slowing their operations, Chinook salmon bycatch would likely increase in the later portion of the B season. All other factors being equal (environmental conditions, pollock aggregations, among other factors), this outcome becomes more likely for chum salmon PSC limits analyzed at lower amounts which are inherently more constraining.

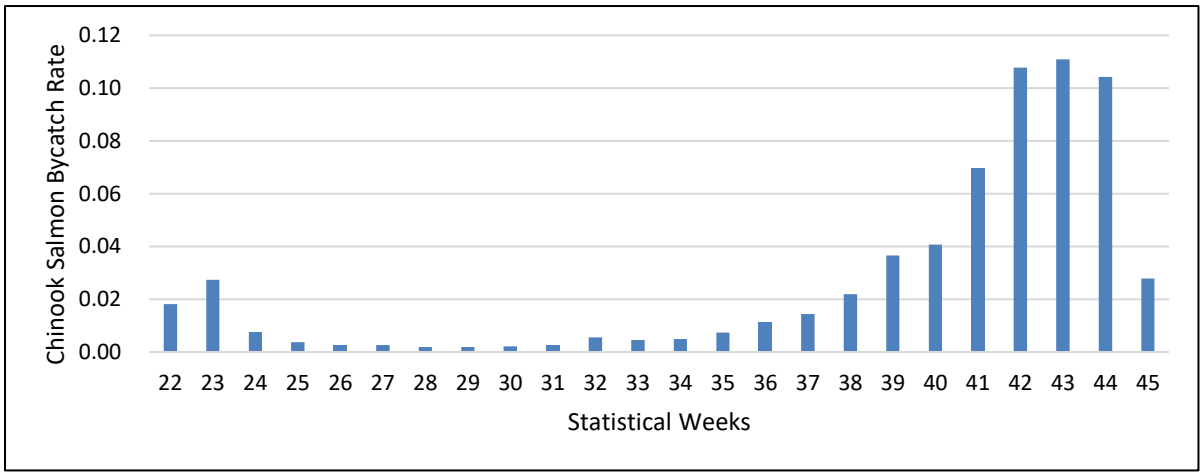

Figure 1-8 Distribution of the average weekly Chinook salmon bycatch rate in the B season pollock fishery, 2011–2023

Notes: Statistical weeks 41–44 typically align with the month of October in a given calendar year.

Chinook salmon bycatch could be reduced under **Alternative 5**, if a sector closed out of fishing in a corridor moved to new fishing grounds with good pollock aggregations that could sustain fishing or production *and* had lower chum and Chinook salmon PSC rates. Chinook salmon bycatch would likely increase if B season pollock catch is moved to areas with lower aggregations of pollock and catch rates. This scenario is more likely to occur if chum salmon avoidance is prioritized in Cluster 1, and to a lesser degree the Unimak corridor because of the substantial pollock harvest that has historically occurred in these areas. Prioritizing chum salmon avoidance in Cluster 2 appears to have the least potential for increases in Chinook salmon bycatch due to the comparatively lower amounts of pollock catch that could be displaced.

Herring PSC

Herring bycatch in the BSAI groundfish fisheries is managed under timed area closures called "Herring Savings Areas". The Herring Savings Areas close when the PSC limit is met which is set at 1% of the herring spawning biomass on an annual basis and apportioned among the trawl fisheries (see 50 CFR 679.21(e)(3)(iv)(B) through (F)). Herring PSC accrues towards the PSC limit on the basis of a fishing year (January 1 to December 31). If the PSC limit is met, the applicable Herring Savings Area will close to the relevant fishery.

From 2011–2023, herring PSC (mt) in the pollock fishery has ranged from 151 (mt) in 2014 to 3,720 (mt) in 2020. Herring PSC tends to be higher during the B season fishery rather than the A season, but the 2020 A season was a notable exception to this trend. The potential impacts to herring bycatch under Alternative 4 are expected to be marginal compared to the status quo. Alternative 2 and 3 could close the

fishery earlier in the B season and thus could reduce herring bycatch. A 100,000-chum salmon PSC limit under Alternative 2 was estimated to reduce herring bycatch by an average of 235 mt due to early B season closures (2011–2023). The estimates on herring PSC reductions were substantially less under hard caps analyzed at the higher end of the range.

A primary point for consideration under Alternatives 2, 3, and 5 are the operational trade-offs that may present themselves inseason as pollock fishermen work to avoid chum salmon, Chinook salmon, and herring PSC. As an example, an inseason corridor under Alternative 5 would reduce the pollock fleet's operational flexibility to avoid herring bycatch to some degree. Herring bycatch was higher inside the Unimak corridor s and chum salmon bycatch rates were highest inside Cluster 2. Prioritizing chum salmon avoidance in Cluster 2 could encourage inshore CVs to target pollock inside Unimak and Cluster 1 and where herring bycatch was higher in recent years (2021–2023). Prioritizing chum salmon avoidance in Cluster 1 or Unimak could potentially reduce herring bycatch but it would also likely produce worse outcomes for chum and WAK chum salmon bycatch compared to status quo.

Overall, the different bycatch regulations and the fleet's behavioral responses to them create a high degree of uncertainty in the direction and magnitude of the potential impacts to chum and WAK chum salmon, Chinook salmon, and herring PSC as compared to Alternative 1.

Table 1-5 Summary of alternatives and options in relation to different PSC species and Council management objectives. The symbols ↑, ↔, ↓reflect improvements, relative neutrality, and potential negative effects all compared to status quo/Alternative 1, respectively

Alt/Opt.	Measure	Chum salmon PSC	WAK chum salmon PSC	Chinook PSC	Herring PSC
2/3	100,000-chum salmon PSC limit	↑	↑	↑↓	↑↓
2/3	550,000-chum salmon PSC limit	↔	↔	↔	↔
4.1	Use historical genetic data to inform likelihood of WAK chum salmon	↑↔	↑↔	↔	↔
4.2	Monitor RHS closures more than once per week	↑	↑↔	↔	↔
4.3	Required use of excluder device for duration of B season	↔	↔	↔	↔
4.4	Develop outlier provision	↑↔	↔	↔	↔
4.5	Weekly reporting to WAK chum salmon users	↔	↔	↔	↔
4.6	Closures when rates are very high	↑↔	↑↔	↔	↔
5.1	Cluster 1 corridor	↓↔	↓↔	↔	↔
5.2	Unimak corridor	↓↔	↓↔	↔	↔
5.3	Cluster 2 corridor	↑↔	↑↔	↔	↔

Bering Sea Pollock Fishery

The proposed changes to the current chum salmon bycatch regulations would apply to participants in the Bering Sea pollock fishery during the B season. From 2011–2023, the number of fishery participants include: 83 inshore CVs and the 6 shore-based processors these vessels deliver to; 16 CPs and 4 motherships that accept deliveries from 18 mothership CVs at-sea, as well as the communities these vessels are registered to and the shore-based processors are located within; the 65 coastal Western Alaska communities that participate in the CDQ program are also engaged in and dependent upon the Bering Sea pollock fishery. Continued management under **Alternative 1** would result in the current social and economic conditions at the local, regional, and state level continuing along current trends. Table 1-6

provides a fisheries engagement matrix for the sectors and communities participating in the pollock fishery.

Alternative 4 is similarly addressed here because it likely to have neutral or slightly increase operating costs for pollock harvesters relative to Alternative 1. The potential for adverse impacts to pollock fishery participants is substantially less under Alternative 4 compared to Alternatives 2, 3, and 5 because this alternative would add six new provisions into Federal regulations and essentially codify operational changes the fleet has adopted in recent years, with some new additions.

Table 1-6 Engagement matrix for communities engaged in or dependent on B season pollock by vessel's registered ownership address, location of shore-based processing facility (2011–2023), CDQ group affiliation, and indicators for community size, minority percentage population, and low-income population (referred to as "Environmental Justice indicators")

Community	CDQ group	Community size (number of persons)	Minority percentage population	Low-income percentage population	CP ownership	Mothership ownership	Inshore CV ownership	Mothership CV ownership	Shore-based processor location	CP product transfer location
Akutan	APICDA	1,589	90.8%	29.9%	NA	NA	NA	NA	1 facility (2011–2023)	NA
King Cove	NA	757	72.5%	16.4%	NA	NA	NA	NA	1 facility (2011–2023)	NA
Kodiak City	NA	5,581	67.8%	10.7%	NA	NA	4.2 CVs at 6.23% of total (2011–2023)	0.8 CVs at 5.92% of total (2011–2023)	NA	NA
Newport	NA	10,256	29.7%	20.4%	NA	NA	4.7 CVs at 7.04% of total (2011–2023)	NA	NA	NA
Seattle MSA	NA	4,018,762	41.2%	11.0%	12.7 vessels at 92.70% of all CPs (2011 –2023)	1.6 motherships at 47.73% of total (2011–2023)	53.5 CVs at 80.16% of total (2011–2023)	12.0 CVs at 92.31% of total (2011–2023)	NA	NA
Unalaska	APICDA	4,254	68.8%	13.2%	NA	1.8 motherships at 52.27% of total (2011–2023)	NA	NA	3 facilities (2011 –2016) 4 facilities (2017–2023)	Location of both CP and mothership product transfers

Notes: Community population (or size) data are based upon the 2020 U.S. Census. The minority percentage population and low-income percentage population are based upon the 2022 American Community Survey estimates. Color shading is provided for contrast. Blue denotes a CDQ community, purple denotes environmental justice indicators, and green denotes community participation in the pollock fishery through vessel ownership address or the location of a shore-based processor. Darker shading within a category indicates higher values.

A chum PSC limit under **Alternative 2 or 3** is expected to motivate changes in fishing behavior if there is a perceived risk of a B season closure. Pollock fishermen would be expected to alter their behavior, to the extent they are able, to avoid a closure and minimize losses associated revenue losses. However, altering harvest strategies may increase avoidance costs. Avoidance of chum PSC would likely decrease harvesting operational efficiency in several ways, which may carry different implications for economic viability and sustained participation across the fleet. Greater sensitivity to chum PSC rates means vessels may need to move more often, conduct more test tows, or fish further from port. It may mean they need to move from areas of good pollock aggregation and/or size/flesh quality to less desirable fishing areas. Increased travel time/movement would increase fuel costs, which could result in increased cost per unit of catch. Decreased operational efficiency could also contribute to a longer B season, which would increase a suite of other variable costs and risk increased Chinook PSC.

Avoidance techniques may delay or prevent a closure resulting from a chum salmon PSC limit. If the sector is unsuccessful, and they are closed early there may be forgone revenue associated with that

unharvested pollock. The analysis of potentially forgone gross revenue uses a retrospective examination of when each pollock sector hypothetically would have hit the various chum salmon PSC limits had the limits been in place in each of the years 2011-2023. Estimates on the amount of potentially forgone gross revenue are intended to provide an upper bound for decision-makers to consider the potential direct revenue impacts and are a way for the alternatives and options to be compared against one another.

The retrospective analysis indicates a 100,000-chum salmon PSC limit would be more constraining for the pollock industry compared to higher cap amounts (Table 1-7). Of the 13 years analyzed, a 100,000-chum salmon PSC limit could have ended B season fishing early for the CDQ sector in 5 or 6 years, 10 or 11 years for the CP sector, 12 years for the inshore sector, and 10 years for the mothership sector. Under this lowest cap, without additional changes in fishing behavior, each sector could have seen an average reduction of 19%-47% in their B season gross revenue. In comparison, a 550,000-chum salmon PSC limit could have potentially ended the B season early for all sectors in 0 to 2 years, depending on the apportionment. This would likely lead to minimal or no forgone revenue at the sector-level. However, the analysis also highlights adverse impacts that may occur at the vessel- company- or cooperative-level from dynamics created from the PSC limits, even if the sector is able to harvest its full apportionment of pollock.

The cap amounts being considered under Alternative 3, Option 2 are the same as Alternative 2 and thus the potential for adverse impacts are expected to be similar in years when a cap is in place. When a chum salmon PSC limit would not be in effect, the impacts to the pollock industry would be similar to status quo. A 75,000-chum salmon cap is possible under Alternative 3, Option 1, if the cap set when one area fails to meet its threshold is 100,000 chum salmon. In the limited number of years that a 75,000-chum salmon PSC limit could have been in effect, the potential impacts to the pollock industry would be greater in magnitude. The analysis indicates that all sectors would have exceeded their apportionment under this cap amount in 2021, the highest bycatch year analyzed. In this year, CDQ, inshore, and mothership sectors would have left more than 60% of their B season pollock allocation unharvested, without additional changes in fishing.

Table 1-7 Summary of the number of years when closures potentially could have occurred and potential reductions in gross first wholesale revenue had chum salmon PSC limits been in place, 2011–2023

Sector	Apportionment	100,000 PSC limit			325,000 PSC limit			550,000 PSC limit		
		Number of years closed (out of 13)	Average forgone revenue (million of 2022$)	% reduction in average B season forgone revenue	Number of years closed (out of 13)	Average forgone revenue (million of 2022$)	% reduction in average B season forgone revenue	Number of years closed (out of 13)	Average forgone revenue (million of 2022$)	% reduction in average B season forgone revenue
CDQ	Least adverse: AFA	5	$18.3	19%	2	$8.6	9%	2	$3.0	3%
	Most adverse: 3-yr avg	6	$21.3	23%	3	$13.9	15%	2	$8.6	9%
CP	Least adverse: AFA	10	$85.7	25%	2	$17.3	5%	1	$17.3	0%
	Most adverse: 3-yr avg	11	$121.4	35%	6	$60.5	18%	2	$60.5	5%
Inshore	Least adverse: 3-yr avg	12	$153.5	40%	2	$15.9	5%	0	$11.8	0%
	Most adverse: AFA	12	$181.8	47%	5	$31.5	9%	1	$11.8	3%
Mothership	Least adverse: 5-yr avg	10	$32.2	38%	4	$38.8	7%	0	$0.0	0%
	Most adverse: AFA	10	$33.6	39%	4	$38.8	7%	1	$2.1	3%

Notes: forgone revenue values are gross first wholesale values for all sectors. For the stake of comparison across alternatives, the analysis also demonstrates forgone gross ex vessel revenue as well, estimated for the offshore sectors that do not generate an ex-vessel price.

An early B season closure could have widespread implications for fisherman, processing crew members, shore-based processors and communities. However, the potential adverse effects would not be experienced evenly throughout the fleet. Reduced revenue could impact companies' ability to immediately cover fixed and variable operational costs. Some AFA vessels and companies are more diversified across other fisheries (e.g., participation in other Bering Sea, Gulf of Alaska, and West Coast groundfish fisheries), which may help them balance potential inter-annual reductions in B season pollock revenue. In general, AFA CPs and CVs are limited in the scope of other federally managed fisheries they could participate in because many are managed under rationalized programs, sideboard limitations that constrain AFA vessels from participating in other Bering Sea and Gulf of Alaska fisheries, and current market conditions.

Harvesting and Processing Crew. Early B season closures could reduce crew members' compensation and/or there is a potential for job losses. An average of approximately 2,300 crew members have been employed on AFA vessels and 1,700 shoreside processing workers have been affiliated with the B season fishery (2014–2023). Separate from an early closure, increased avoidance costs and decreased operational efficiency may also result in additional impacts to harvesting and processing crew. For instance, many crewmembers are compensated through a share-based wage, therefore increased vessel costs, decreased revenue and longer trips could all contributed to a lower pay-per-day for crew members. It is expected that efforts to avoid reaching a chum salmon PSC limit may increase uncertainty among captains and crew regarding employment in the fishery as longer B seasons and time away from home and/or lower pay would affect crew morale and retention which may also have implications for at-sea safety and productivity.

Shore-based Processors. Compared to other sectors, the inshore CVs are more limited in the chum salmon avoidance strategies they can use. The shore-based processors they deliver to have requirements to ensure a fresh, high-quality product that limit how far these vessels can travel to find new fishing grounds with high pollock catch rates and low PSC. There is diversity in the size, capacity and horsepower of vessels within the inshore CV sector and smaller, lower capacity CVs may be disproportionate challenged in where they can fish. The potential impacts to shore-based processors are inherently connected to the bycatch performance of the CVs that deliver to them.

B season pollock accounted for an annual average of 43.82% ($374.21 million) of these processors' gross revenue. This suggests these processors have a high degree of dependency on the B season fishery. More broadly, early B season closures or lower and slower deliveries from inshore CVs could destabilize processing operations which would impact the other fisheries—Pacific cod, crab, halibut, salmon, sablefish among others—that these processors participate in. Pollock is a high-volume fishery that allows these processors to operate at a cost-effective rate, given the capacity of the facility and the expectations for the catch and delivery rates of the inshore CVs. Slower or interrupted delivers could limit these companies' ability to continue participating in other fisheries, including other facilities in non-pollock dependent communities, that may be of critical importance to the fishermen and communities that rely on them.

Pollock Dependent Communities. The Seattle Metropolitan Statistical Area[15] (MSA), Newport, Kodiak City, Unalaska, Akutan, and King Cove are communities substantially engaged in or dependent upon the B season fishery. Unalaska is an Alaska community uniquely affiliated with all sectors, and so is the Pacific Northwest community of Seattle MSA. All of these communities hold identities as "fishing communities" in some form. Early closures and/or high avoidance costs could have far-reaching economic and social implications.

Unalaska, Akutan, and King Cove could experience direct and adverse impacts through reduced fishery-related tax revenues, a loss of jobs within the community, and reduced spending at support sector businesses. Unalaska earned an average of $5.30 million in direct fishery-related tax revenue from B

[15] The Seattle MSA is composed of King, Snohomish, and Pierce counties in Washington State.

season pollock (2011–2022). This represented 16.50% of the City's total general fund revenue and provides a sense of scale for the potential economic impacts to the community. It is worth noting that shore-based processors and their communities could also experience adverse impacts apart from an early closure if the processor(s) receives lower wholesale prices because the pollock delivered is of lower quality. This scenario would reduce processors' gross revenue as well as the revenue earned from the State's Fisheries Business Tax.[16]

The potential impacts to Kodiak City and Newport are somewhat different in their nature and scope. The B season pollock fishery accounted for an average of 25.57% ($3.55 million) and 36.84% ($5.93 million) of the gross revenue CVs affiliated with Kodiak City and Newport (respectively) earned from all fisheries (2011–2023). Early B season closures or high avoidance costs would have an adverse impact on these vessels, their crew, and by extension the communities they are affiliated with in terms of reduced income and economic activity (for instance, harbor fees or spending at gear shops). The B season fishery plays a meaningful role in these vessels' business plans and the opportunities to participate in other fisheries are limited, but pollock has also provided a sense of stability. As younger fishermen weigh the many trade-offs of entering the industry, the possibility of a constraining hard cap or the observance of an early closure could discourage fishermen from buying into the industry in the future.

Seafood Markets. Alaska's seafood industry is currently facing a variety of challenges – record-low seafood prices, inflation, increased transportation costs, increased competition from foreign producers, among others. These are cross-cutting issues that are largely external to the regulatory changes being considered in this preliminary DEIS, but theses dynamics could make pollock fishery participants more vulnerable to the potential adverse economic effects from a B season closure. For instance, frequent or erratic closures in the B season may make it more difficult to maintain new or existing markets with other external pressures.

CDQ Groups and Communities. The overall caps being considered under Alternative 2 and 3 have the potential to reduce CDQ revenue through their direct allocation of pollock and investments in the AFA fisheries. The CDQ groups receive an allocation of pollock and five of the six groups also have ownership or partnerships in AFA companies that could be impacted by the proposed PSC limits. CDQ pollock has typically been harvested on CPs and for many groups this involves leasing the quota to an AFA company. Since all CDQ groups are focused on supporting their regions and communities, both the groups and their communities may experience adverse impacts from an overall hard cap both through their allocations of CDQ pollock and their AFA investments. Direct CDQ pollock allocations typically make up a large and stable portion of group revenues from CDQ species (~70% in 2023). Between the pollock quota for CDQ and AFA, CDQ groups have connections to ~29% of the total directed Bering Sea pollock fishery.

These connections to the pollock fishery provide a primary and important source of revenue for the groups with which to support their mission of providing economic and social benefits to the communities they represent. Each CDQ group supports diverse programs for their respective regions and communities, including employment opportunities, shore-based fisheries development, in-community infrastructure projects, educational scholarships, and financial support for local participation in small boat fisheries and subsistence activities. Changes in net revenues could impact the CDQ groups' ability to continue supporting these types of programs, depending on the magnitude of overall decreases or variability in revenue.

Alternative 5 would not inherently result in forgone revenue for the industry but could lead to increased avoidance costs and decreased operational efficiency, similar to Alternative 2 and 3. Vessels displaced from a corridor closure could continue fishing outside the area until September 1st and return to fishing inside if it is beneficial for them to do so. Since the risk and consequence of corridor closures are different across sectors and the corridor considered, the impacts are considered by sector separately. Similarly, the

[16] The Fisheries Business Tax is typically paid by the first processor of fish, or the exporter of unprocessed fish, on the raw fish landed in the state.

analysis suggests there would be differential changes in fishing behavior among the sectors. The degree of anticipated operational response based on the potential risk and consequence by sector is summarized in Table 1-8.

Table 1-8 Summary of sector-level reliance on the corridors and potential operational responses to avoid the consequence of reaching corridor caps under Alternative 5

Corridor	Sector	Reliance on corridor	Potential operational response*
Cluster 1	CDQ/ CP	Moderate	Variable based on the conditions of that year
	Mothership	Moderate	Variable based on the conditions of that year
	Inshore	High	Broad strategic changes in fishing at the beginning and throughout the B season
Unimak	CDQ/ CP	Low	Limited operational changes
	Mothership	Moderate	Variable based on the conditions of that year
	Inshore	High	Broad strategic changes in fishing at the beginning and throughout the B season
Cluster 2	CDQ/ CP	Moderate	Variable based on the conditions of that year
	Mothership	Low	Limited operational changes
	Inshore	Moderate	Variable based on the conditions of that year

*Depending on cap level and apportionment chosen.

The analysis indicates not all corridor caps would impact all sectors. The mothership sector relied on Cluster 2 for its pollock harvests to varying degrees and would have been moved out of that corridor in 1–2 of the 13 analyzed years. CP pollock (and CDQ) has primarily been caught outside of Cluster 1 with very little dependency on the Unimak corridor because it is fully encompassed within the CVOA. Corridor cap apportionments are based on a sector's historical PSC inside the corridor, so with a small amount of the total cap the risk of a Cluster 1 closure could be high for either sector. However, the consequence of a temporary closure may not be very high and thus not motivate changes in fishing behavior.

The inshore sector would be most impacted by a Cluster 1 corridor and the Unimak corridor to a lesser degree. In the most recent five years (2011–2023), 42% to 98% of the inshore sector's B season pollock was harvested in Cluster 1 and to 35% to 86% in the Unimak corridor. The inshore sector has relied on the fishing grounds in these corridor areas because they have historically had good aggregations of pollock that can sustain fishing, but also because of their processors' delivery requirements which are less costly to fulfill when pollock is caught closer to port. A temporary closure of either corridor would likely move these vessels to outside areas to continue fishing, to the extent they are able to do so. The analysis indicates a Cluster 1 corridor closure would have put $0–$36.2 million in gross ex vessel revenue "at risk," depending on the PSC limit and apportionment for a Cluster 1 corridor (2011–2023).

Depending on the corridor-cap amount, the inshore sector could respond to the risk of losing access to the Cluster 1 and Unimak corridors with different strategies to avoid that cap. Cooperative manages could carefully monitor chum salmon bycatch inside the corridor and move vessels more frequently (i.e., have a lower threshold for when movement needs to be considered or occur). Cooperatives may also send larger vessels with greater capability to fish further away from port and outside of the corridor because chum salmon PSC caught outside the corridor would not accrue toward the cap. As such, smaller inshore vessels with lower capacity may be disproportionately constrained by the inseason corridor cap.

The potential impacts to shore-based processors and pollock dependent communities would be similar in nature to those summarized for Alternative 2 and 3, but the magnitude under Alternative 5 would generally be less. An exception to this could arise from a scenario where a Cluster 1 or Unimak corridor cap was very constraining for one or more inshore cooperatives such that shore-based processors' operations were substantially disrupted.

Comparison of Impacts of the Alternatives

This part of the Executive Summary provides a high-level, quantitative overview of the potential impacts to different resource categories. The important context and uncertainties associated with these estimates have been described qualitatively and at length throughout the Executive Summary and preliminary DEIS.

Table 1-9 Summary of impacts of the alternatives to minimize chum salmon PSC in the Bering Sea pollock fishery

Category	Alternative 2 and 3	Alternative 4	Alternative 5
Description of Alt.	*Alt 2.* Hard cap 100,000-550,000 chum salmon; four options for sector apportionments and options for transfers. *Alt 3.* Hard cap of 75,000-550,000 (opt. 1) or 100,00-550,000 chum salmon (opt. 2). Cap is only in place when indices fail to meet thresholds, either the Three-area index (opt. 1) or Yukon area index (opt. 2); apportionment and transferability provisions are the same as Alt. 2.	Modify salmon bycatch IPA regulations to include six additional provisions for chum and WAK chum salmon avoidance.	Inseason corridor in place from June 10 to Aug. 31. Corridor closure triggered by corridor caps of 50,000-200,000 in Cluster 1 and Unimak and 50,000 or 100,000 in Cluster 2. Apportionment and transferability provisions are the same as Alt. 2 and 3.
Chum salmon			
Total chum salmon PSC reductions	*Alt 2.* Chum salmon PSC reduced by an average of 2,210 (550K cap, AFA) to 150,936 fish (100K cap, pro rata). *Alt 3.* Total PSC reductions are less than what is anticipated across years under Alternative 2. Avg. reductions from 75K cap ranged from 178,317 (AFA) to 200,731 (3-yr avg.) in limited years.	Similar to status quo with increased potential for lower chum salmon PSC. Recent IPA changes have coincided with increasingly lower overall levels of chum salmon PSC, 2022 PSC was a 55% reduction, 2023 PSC an 80% reduction, and 2024 a 94% reduction from 2021 level.	2019–2023 avg. weekly chum bycatch rate peaks at 4.0 chum/mt pollock in Cluster 2 compared to 0.93 and 1.05 chum/mt pollock in Cluster 1 and Unimak respectively. Prioritizing chum salmon avoidance in Cluster 2 presents the lowest risk of creating adverse outcomes for chum salmon PSC. Highest potential savings and risk result from prioritizing avoidance in Cluster 1.
WAK chum salmon PSC reductions (AEQ)	*Alt 2.* CWAK AEQ reduced by an average of 564 (550K cap, AFA) to 21,678 fish (100K cap, pro rata). Highest single year of savings estimated to occur in 2017 at 47,862 fish. Upper/Middle Yukon AEQ reduced by an average of 101 (550K cap, AFA) to 3,435 fish (100K cap, pro rata). Highest single year of savings estimated to occur in 2017 at 11,553 fish. *Alt 3.* Highest single year of CWAK AEQ savings estimated in 2022 at 35,318 fish (75K cap, 3-year avg.); highest single year of Upper/Middle Yukon savings estimated in 2021 at 3,627 fish (75K cap, 3-year avg.).	Similar to status quo with increased potential for lower WAK chum salmon PSC.	2019 –2023 avg. WAK chum proportions in Early period were ~19% in Cluster 1, 22% in Unimak, and 11% in Cluster 2. Late period proportions were ~19% Cluster 1, 18% in Unimak, and 10% in Cluster 2. WAK chum PSC rates highest in Cluster 2. Despite lower historical proportions of WAK chum in Cluster 2, adverse impacts to WAK chum PSC expected if pollock catch was moved to Cluster 2.
Chinook salmon			
Chinook salmon PSC	Variable impacts to Chinook salmon PSC but constrained by existing PSC limits and not expected to jeopardize sustainability of stocks. *Alt 2.* Annual avg. Chinook PSC reductions range from 773 fish (550K cap, AFA) to 5,448 (100K cap, AFA). Potential PSC increases not quantified. Later fishing in the B season when Chinook rates are highest would increase Chinook PSC compared to status quo; scenario more likely at lower chum cap amounts.	Likely similar to status quo.	Avg. Chinook PSC rates highest in Cluster 1 and Unimak for CP/CDQ and Mothership in October and Cluster 2 for shoreside. Prioritizing chum salmon avoidance in Cluster 1 has the greatest potential for adverse impacts to Chinook PSC. Similar to Alt 2 and 3, impacts would be constrained by existing PSC limits.

Pollock			
Pollock stock	Potential for reduced catches. Not expected to impact the productivity of the pollock resource.	Likely similar to status quo. Not expected to impact the productivity of the pollock resource.	Potential for reduced catches but less likely than Alternative 2 or 3. Catch location could move but would occur within historical footprint of the fishery. Not expected to impact the productivity of the pollock resource.
Pollock catch	*Alt 2.* Avg. *f*orgone pollock catch ranged from 15,741 mt (550K cap, AFA) to 272,620 mt (100K cap 3-year avg.). CP and CDQ most constrained by 3-year avg. apportionment and least constrained by AFA. Mothership most constrained by AFA and least constrained by 5-year avg. Inshore most constrained by AFA and least constrained by 3-year avg.	Likely similar to status quo.	*Opt. 1, Cluster 1:* avg. pollock catch displaced ranged from 4,846 mt (200K cap, 5-year avg.) to 106,383 mt (50K cap, AFA). *Opt. 2, Unimak:* avg. pollock catch displaced ranged from 0 mt (200K cap, 3-, 5-year, and pro rata) to 89,005 mt (50K AFA). *Opt. 3, Cluster 2:* avg. pollock catch displaced ranged from 9,091 mt (50K cap, AFA) to 16,927 mt (100K cap, 3-year avg.) Inshore sector more impacted by Cluster 1 compared to other areas; mothership CVs would be impacted by Cluster 1/Unimak; CP/CDQ primarily affected by Cluster 2.

Next Steps

The Council will review this preliminary DEIS at its February 2025 meeting. At that time, the Council may choose to modify the proposed alternatives and/or recommend a Preliminary Preferred Alternative (PPA). The Council may recommend the preliminary DEIS be revised and published by NMFS. The Council is not required to identify a PPA prior to recommending the agency publish the DEIS, but a benefit of doing so is that it provides an opportunity for more focused public comment and input to be received on the published DEIS.

To move this action and the current set of alternatives forward, there are several points for consideration that need to be addressed and are outlined in Table 1-10 below. Each point for consideration is written to convey what decisions the Council may want to make now as well as those that must eventually be made in a final recommendation to move that alternative forward.

Table 1-10 Points for consideration to further develop the proposed alternatives

Alternative/Option	Points for Consideration
Alt 1. No Action	No additional points for consideration. Selecting Alternative 1 would retain the current regulations for chum salmon bycatch management in the Bering Sea.
Alt 2. Hard Cap	○ Does the Council want to continue its consideration of Alternative 2 at this time? ○ If yes, it may identify a cap amount and apportionment approach to include in a PPA. The Council is not required to do so, but these components would need to be included in a final recommendation.
Alt 3. Hard Cap with Index	○ Does the Council want to continue its consideration of Alternative 3 at this time? ○ If yes, it may identify a cap amount and apportionment approach to include in a PPA. The Council is not required to do so, but these components would need to be included in a final recommendation. ○ If yes, the Council may also identify one index for WAK chum salmon abundance to include. The two options for indices are mutually exclusive and one would need to be included in a final recommendation. ○ If yes, the Council may also identify one threshold amount for WAK chum salmon abundance to be used. Only one threshold amount would be included in a final recommendation.
Alt 4. Modifications to the IPAs	○ Does the Council want to continue its consideration of Alternative 4 at this time? ○ If yes, the six provisions may be individually selected, or all could be included in the Alternative. No provisions are mutually exclusive.
Alt 5. Inseason Corridors Closed by a Cap	○ Does the Council want to continue its consideration of Alternative 5 at this time? ○ If yes, the Council may identify one corridor, cap amount, and apportionment to include in a PPA. It is not required do to so, but these components would need to be included in a final recommendation. The three inseason corridors being considered are mutually exclusive and only one could be included in a final recommendation.