

# C2 Bering Sea Chum Salmon Bycatch

Presentation to the Council, February 2025

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# Order of the C2 Agenda Item

1. Preliminary Draft Environmental Impact Statement (preliminary DEIS)
  - The National Marine Fisheries Service (NMFS) is the lead federal agency
    - Three Cooperating Agencies providing special expertise: Alaska Department of Fish & Game (ADF&G), Kuskokwim River Inter-Tribal Fish Commission (KRITFC), and Tanana Chiefs Conference (TCC)
2. NMFS Tribal Consultation and engagement report
3. KRITFC presentation on Appendix 7
4. TCC presentation on Appendix 8
5. 2024 Bering Sea chum salmon genetics report



## The Council is considering new management alternatives to minimize chum salmon bycatch in the Bering Sea pollock fishery

- **Purpose:** reduce chum salmon bycatch to the extent practicable, particularly Western Alaska (WAK) chum salmon bycatch
  - Maintain priority objectives of the Chinook salmon bycatch avoidance program
  - Balance National Standards
- **Need:** proposed changes are being considered in light of recent and ongoing declines in WAK chum salmon



# Proposed Regulatory Changes Apply to the Bering Sea Pollock Fishery

- 4 sectors: offshore catcher processors, inshore catcher vessels, motherships, and CDQ
- Bycatch varies by sector

Year	Chum salmon PSC in all BSAI groundfish fisheries	Annual chum salmon PSC in the pollock fishery	Chum salmon PSC in the pollock fishery as percent of total chum salmon PSC in all BSAI groundfish fisheries	B season chum salmon PSC in the pollock fishery	B season chum salmon PSC in the pollock fishery as percent of annual total
2011	194,783	191,435	98.3%	191,313	99.9%
2012	23,138	22,183	95.9%	22,172	99.9%
2013	126,463	125,316	99.1%	125,114	99.8%
2014	223,867	219,442	98.0%	218,886	99.7%
2015	241,491	237,752	98.5%	233,085	98.0%
2016	346,000	343,001	99.1%	339,236	98.9%
2017	469,769	467,678	99.6%	465,848	99.6%
2018	307,367	295,062	96.0%	294,675	99.9%
2019	354,681	347,882	98.1%	346,671	99.7%
2020	344,849	343,625	99.6%	343,094	99.8%
2021	548,752	546,042	99.5%	545,901	99.9%
2022	243,695	242,375	99.5%	242,309	99.9%
2023	113,478	112,294	99.0%	111,843	99.6%
<b>Average</b>	<b>272,179</b>	<b>268,776</b>	<b>98.5%</b>	<b>267,704</b>	<b>99.6%</b>

Table 3-8, pg. 85



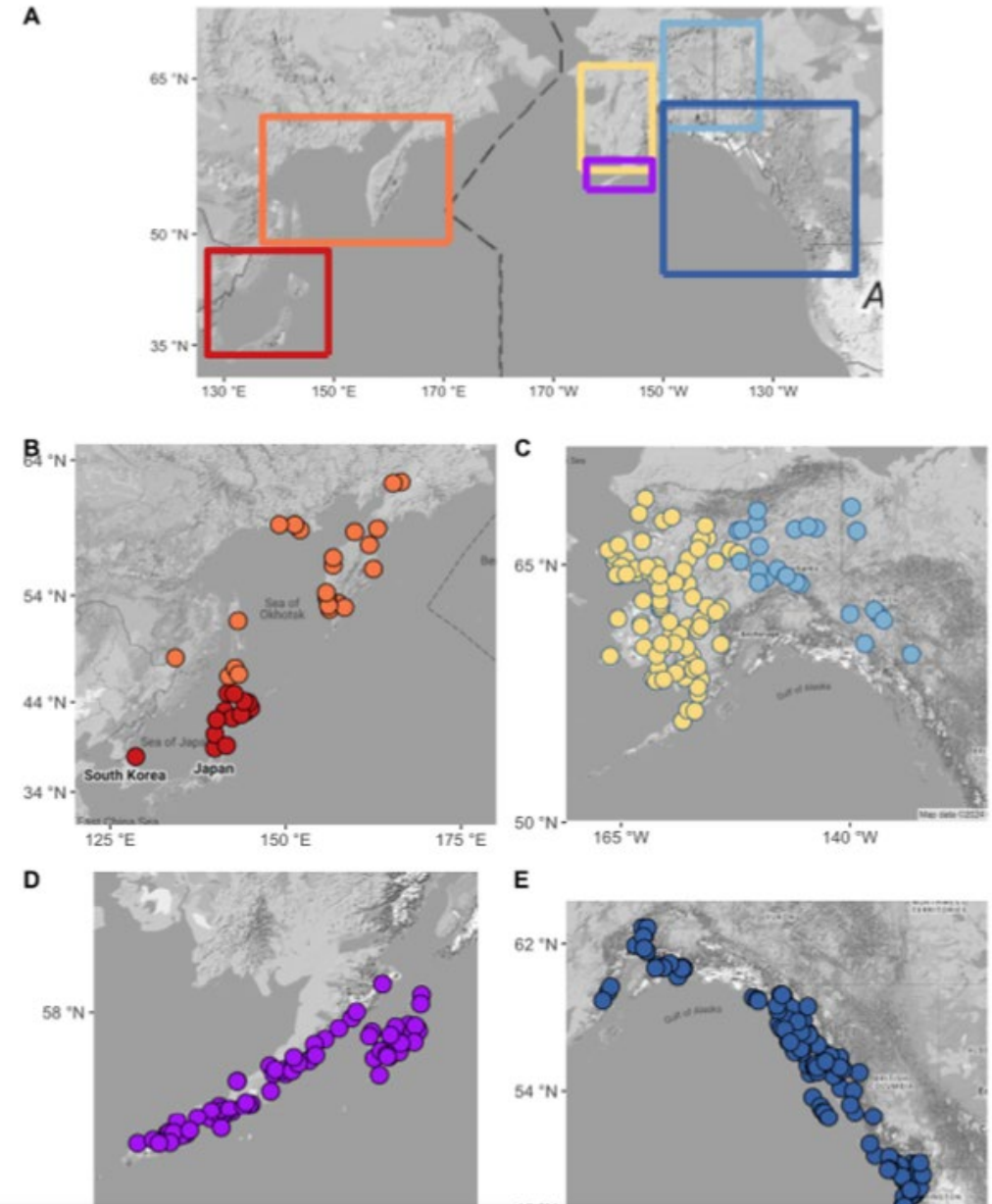
# Chum Salmon Genetic Baseline

Section 3.2.4.1.3

## Six genetic reporting groups

1. Northeast Asia
2. Southeast Asia
3. Coastal Western Alaska (CWAK)
4. Upper/Middle Yukon
5. Southwest Alaska
6. Eastern Gulf of Alaska/Pacific Northwest

**“Western Alaska chum salmon” =  
CWAK + Upper/Mid Yukon**



Six reporting groups of baseline chum salmon populations used in this report, circles represent individual populations represented in the baseline.

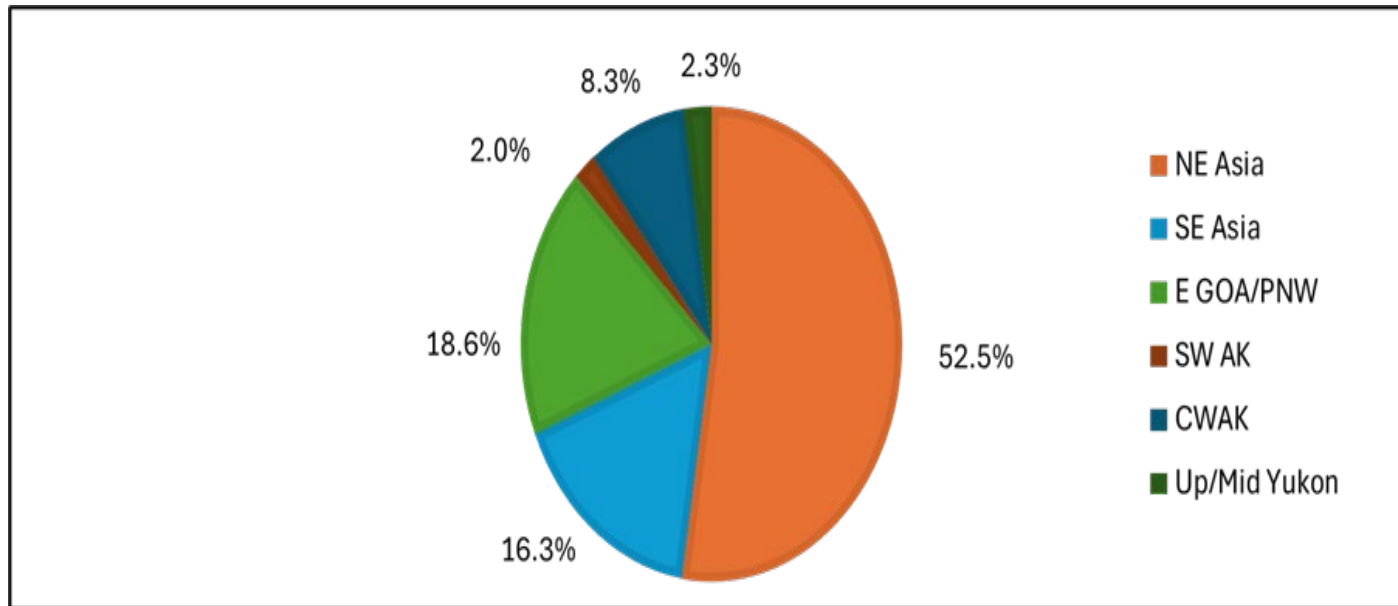
(A) Range wide distribution of the six reporting groups.

Source: Barry et al. 2024

# Western Alaska Chum Salmon Bycatch Trends

**Proportion of Western Alaska chum salmon varies each year, averaging 18.6% (2011–2023)**

- During the 2023 B season – 111,843 chum salmon caught as bycatch
  - 10.6% (11,491 chum salmon) estimated to originate from WAK river systems



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



## Council Actions on C2

### At this meeting, the Council may decide:

1. Whether to modify the current range of action alternatives, and if so, how
  - Table 1-3 provides a comparison of each alternative
  - Table 1-10 provides points for consideration to further develop each alternative
2. Whether to request additional analytical review through an additional Council meeting
  - Tentative timeline is available in the action memo
3. Whether to recommend the analysis be released for publication by NMFS as the draft EIS
  - The Council can recommend publication whether the alternatives are modified or not



# Outline for the Remainder of the Presentation

- ~~1. Introduction~~
2. Alternatives
3. Environmental Assessment
4. Social and Economic Assessment
5. Combined Effects of the Alternatives
6. Management, Monitoring, and Enforcement
7. Recap and Final Points for Consideration







Dutch Harbor, ASMI Industry and Partner Use

## Alternatives (Chapter 2)

**Alternative 1:** No Action

**Alternative 2:** Overall chum salmon PSC limit

**Alternative 3:** Overall chum salmon PSC limit with abundance indices

**Alternative 4:** Changes to IPA regulations

**Alternative 5:** Inseason corridors triggered by area-specific PSC limits

**Regulatory changes would be in effect during the B season pollock fishery from June 10 – November 1**



# Alternative 1, No Action

Section 2.2.1  
and 2.2.2

## Rolling Hotspot System (RHS)

- Dynamic area closures based on catch and bycatch data
- Areas with high chum salmon bycatch rates closed for a period
- Closures managed by third party entity
- Governed under Incentive Plan Agreements (IPAs)

## Chum Salmon Savings Area

- Time/area closure that is closed to all trawling August 1–31
  - If 42,000 “non-Chinook” salmon caught from August 15–October 14, area remains closed
- Regulations exempt pollock vessels from if they are governed by an IPA



## Alternative 2, Overall Chum Salmon PSC Limit

Section 2.3

### **Overall PSC limit or “hard cap” in place during each B season (June 10–November 1)**

- All non-Chinook (i.e., chum salmon) count towards the cap
- Range: 100,000–550,000 chum salmon based on history (2011–2022)
  - Council may select any amount within the range
- If the hard cap is met by a sector or the fleet, fishing must stop

**Alternative 2 is mutually exclusive to Alternative 3**

**Can be selected with Alternative 4 or 5**



# Apportioning the Overall PSC Limit, Alternative 2 (and 3)

- Four different options for dividing the hard cap among the pollock fishing sectors
  - 3-year average, 5-year average, pro rata, AFA allocation based on history (2011-2022)
  - Further divided among inshore cooperatives and CDQ groups

Based on inshore cooperatives' and CDQ groups' pollock allocation

**Table 2-2 Summary of apportionment percentages by option and sector**

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

Notes: The AFA percentages under Option 4 reflect the CDQ program's pollock allocation and the AFA sectors' pollock allocation of the directed fishing allowance, the latter of which sets aside the ICA which is used for the incidental catch of pollock in other groundfish fisheries.



**Overall PSC limit or “hard cap” *may* be in place during the B season, if WAK chum salmon returns do not exceed their thresholds**

- All non-Chinook (i.e., chum salmon) count towards the cap
- Two options for abundance indices are being considered
  - Option 1: Three-area index – cap range of 75,000 to 550,000
  - Option 2: Yukon Area index – cap range of 100,000 to 550,000
- Sector apportionments and transferability provisions are the same as Alternative 2

**Alternative 3 is mutually exclusive to Alternative 2**

**Alternative 3 may be selected with Alternative 4 or 5**



# Alternative 3, Option 1 Three-Area Index

Section 2.4.1

Area	Available Data	Thresholds
<b>Yukon</b>	Run reconstructions for Yukon summer and fall chum salmon	1,713,300 or 2,718,400 summer + fall chum
<b>Kuskokwim</b>	Bethel test fishery cumulative CPUE	2,800 or 5,200 chum
<b>Norton Sound</b>	Standardized index of escapements for the Snake, Nome, Eldorado, Kwiniuk and North Rivers + total harvest for Norton Sound	57,300 or 91,500 chum

Thresholds are the 25th and 50th percentile values of each data source representing area abundance, 1992-2022

Only one threshold selected for implementation



# Alternative 3, Option 1 Step Down Provisions

Section 2.4.1

- If all three areas (3/3) have returns above thresholds, a hard cap **would not** be in place the next B season
- If only two areas (2/3) have returns above thresholds, a hard **would be** in place in the next B season
  - Hard cap would be an amount between 100,000 to 550,000 chum
- If only 1 or 0 areas (1/3 or 0/3) have returns above thresholds, a hard cap **would be** in place in the next B season
  - Hard cap would be 75% of the amount selected when 2/3 areas are above thresholds





# Alternative 3, Option 2: Yukon Area Index

Section 2.4.2

Yukon Area	Available Data	Thresholds
Summer chum	Run reconstruction	1,268,700 or 1,978,400 chum
Fall chum	Run reconstruction	444,600 or 803,000 fall chum

- If 2/2 stocks are above thresholds, a hard cap **would not** be in place
- If 1 or 0 stocks are above its threshold, a hard cap **would be** in place the following B season at 100,000–550,000



# Alternative Data Sources for Bethel Test Fishery

Appendix 2, pgs. 13-14 and Appendix 7, pg. 33

**New information indicates funding to operate the Bethel Test Fishery is uncertain beginning in 2025**

ADFG and KRITFC have identified other available data sources and their advantages/disadvantages

- a) Kuskokwim Sonar
- b) Kogrukluk River weir
- c) Other weirs: Kwethluk River, Salmon River (Aniak), George River, Takotna River
- d) Total harvest: commercial, subsistence, test fisheries, and recreational
- e) Drainage wide run reconstruction - *not available at present*

**The Council would need to identify thresholds for the alternative data source - subsequent analytical implications**



# Reference for Alternative Kuskokwim Data Sources

Appendix 2, pgs. 13-14

Alternative data source	Summary of advantages	Summary of disadvantages
<b>Kuskokwim Sonar</b>	Reliable funding; estimates abundance past Bethel; uses standard methods as the Yukon and Kenai Rivers; correlates well with LKTK; information is available to the public; and may be used to inform future run reconstruction model.	Short time series (2018-present); has not operated in high run years but has operated in record low (2021) to above average (2018); values likely to change based on further evaluation of biases in species apportionment; future drainagewide telemetry (2026 and 2027) may assist bias investigation and potential corrections.
<b>Kogrukluk River Weir</b>	Long time series (1976-present); reliable funding; annual escapements correlate well with drainage wide Kuskokwim River sonar index; Kogrukluk has the only chum escapement goal for the Kuskokwim River; data is available to the public.	Single river system is a partial index of abundance and not representative of total drainagewide abundance; if combined with total drainagewide abundance, potential for double counting; environmental factors (e.g., flooding) may prevent weir from providing reliable estimates in that year.
<b>Other Weirs (Kwethluk, Salmon, George, and Takotna Rivers)</b>	Projects have long time series; various agencies plan to operate in the future; information is available to the public.	Projects are currently funded through competitive grants; partial index of abundance and not representative of drainagewide abundance; if combined with total drainagewide abundance, potential for double counting; environmental factors (e.g., flooding) may prevent weir from providing reliable estimates in that year.
<b>Total Harvest (Commercial, Subsistence, Test Fisheries and Recreational)</b>	Long time-series; collected annually and plans to continue to in the future; information is available to the public.; in-season lower river subsistence harvest estimates produced by KRITFC are available post-season in early fall.	Commercial harvests influenced by other factors besides abundance; subsistence and commercial harvests influenced by management decisions; partial index of abundance and not representative of drainagewide abundance; if combined with total drainagewide abundance, potential for double counting; commercial harvest estimates are confidential in years with less than three permit holders; river-wide subsistence/commercial harvest estimates from ADF&G not available post-season in early fall.
<b>Drainagewide Run Reconstruction</b> <b>**Not Presently Available**</b>	Would provide estimates on total abundance; potential for long time-series (1976-present); statistical model used for run reconstruction has been published and can easily be reproduced; uses multiple assessments and is consequently less vulnerable to unforeseen circumstances; analogous to the run reconstruction used for Chinook 3-area index.	Has not been peer reviewed or updated since 2008; not currently being used by ADF&G, KRITFC, or USFWS; Drainage wide telemetry planned for 2026 and 2027 which may assist in correcting Kuskokwim River sonar bias and scaling run reconstruction models.



# Alternative 4, Changes to IPA Regulations

Section 2.5

## Six regulatory provisions for chum salmon avoidance added to IPA regulations

- Proposals submitted prior to April 2024 meeting
- IPAs would be required to include measures that respond to these provisions
- CP IPA was amended in 2022 and the Inshore SSIP and MSSIP were amended in 2024

Can be selected with Alternatives 2, 3 or 5

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 ADF&G weekly stat area bycatch rates exceed 5 chum per ton of pollock (CP) and 3 times base rate (CV and MS).

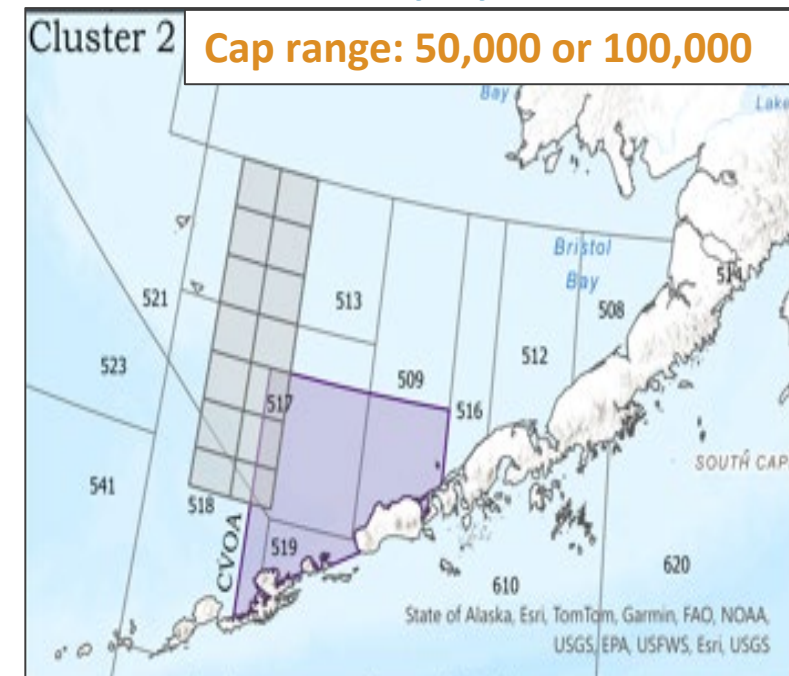
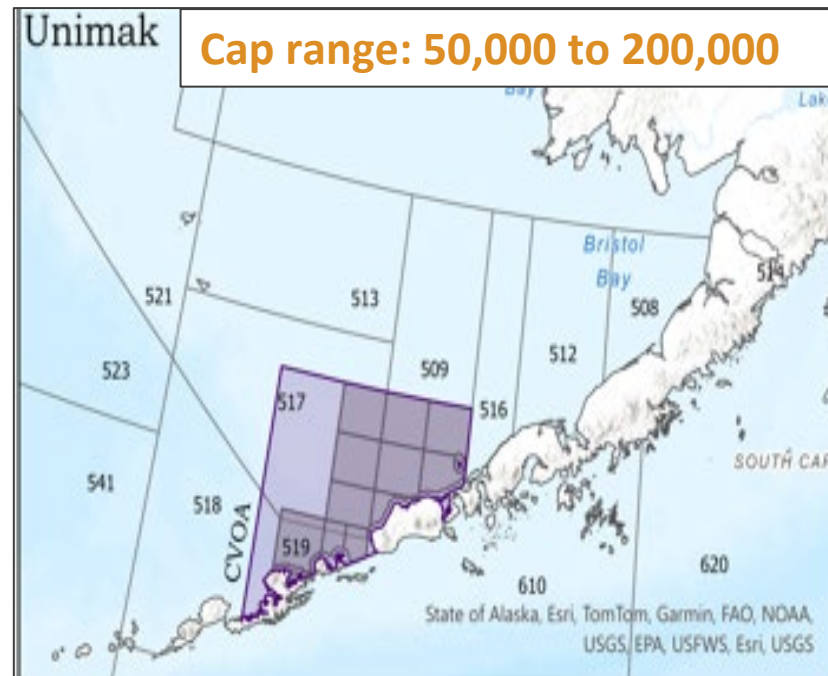
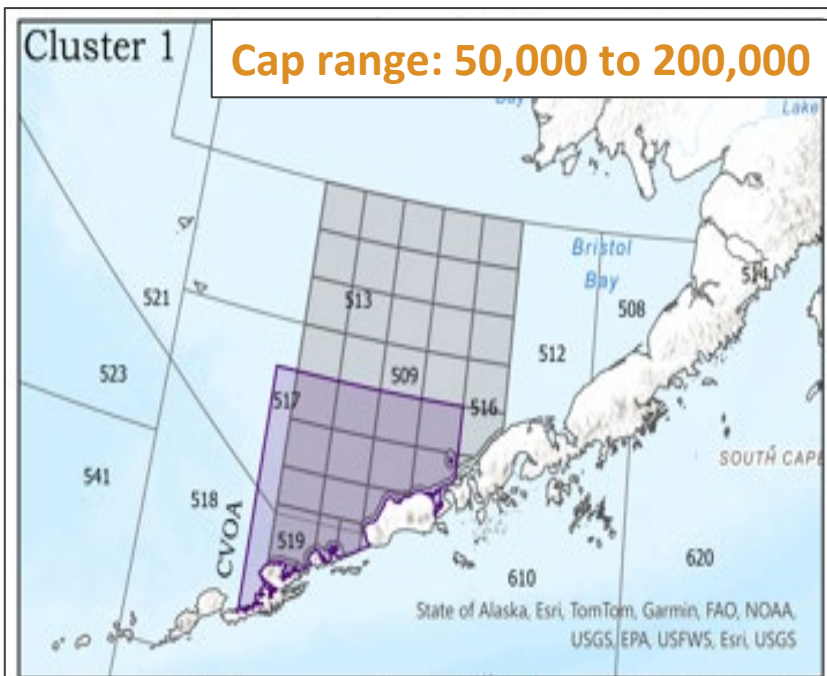


# Alternative 5, Inseason Corridors

Section 2.6

- Three inseason corridors triggered by PSC limits ranging from 50,000–200,000 chum salmon, but only one may be selected for implementation
- Chum salmon caught inside the corridor from June 10–August 31 count towards the PSC limit
- If the PSC limit is met, NMFS would close the area until September 1, but vessels may continue fishing outside

Can be selected with Alternatives 2, 3, or 4





# Alternative 5, Inseason Corridor Apportionments

**Table 2-10 Sector- and corridor-specific apportionment percentages under Alternative 5**

Corridor	Apportionment	CDQ	CP	Mothership	Inshore
<b>Cluster 1</b>	3-Yr avg.	12.9%	0.5%	10.3%	76.3%
	5-Yr avg.	10.3%	1.0%	8.7%	80.0%
	Pro-rata	12.2%	9.4%	10.0%	68.5%
	AFA	10.0%	36.0%	9.0%	45.0%
<b>Unimak</b>	3-Yr avg.	15.3%	0.0%	7.8%	76.9%
	5-Yr avg.	11.5%	0.0%	6.7%	81.8%
	Pro-rata	14.0%	9.0%	8.1%	68.9%
	AFA	10.0%	36.0%	9.0%	45.0%
<b>Cluster 2</b>	3-Yr avg.	0.6%	24.6%	10.2%	64.5%
	5-Yr avg.	1.7%	29.4%	8.6%	60.3%
	Pro-rata	3.0%	27.4%	9.9%	59.7%
	AFA	10.0%	36.0%	9.0%	45.0%

Source: NMFS Alaska Region CAS, data compiled by AKFIN.

**Further divided among the inshore cooperatives and CDQ groups**





Dutch Harbor, ASMI Industry and Partner Use

# Environmental Assessment (Chapter 3)

# Resource Components Analyzed

## Environmental Assessment (Chapter 3)

All resources categories analyzed for potential impacts of the proposed alternatives

1. Eastern Bering Sea pollock stock
- 2. Chum salmon**
- 3. Chinook salmon**
- 4. Herring**
5. Marine Mammals
6. Seabirds
7. Habitat
8. Ecosystem and Climate Change





# Incentive Structure Under the Alternatives

No action

**Alt 1**

Chum PSC limit

**Alt 2**

Chum PSC limit, triggered by abundance

**Alt 3**

IPA measures

**Alt 4**

Corridor cap

**Alt 5**

Regulatory and non-regulatory status quo incentives (e.g., Incentive generated by the IPAs including newly adopted measures, responding to outside pressure, CDQ associations, etc.)

***In addition to status quo incentives:***

Harvesters will be incentivized to avoid **all** chum salmon to prevent a fishery closure or having to take more severe measures (e.g., fleet consolidation) to catch pollock.

Strength of incentive depends on vessel/cooperative-level assessment of risk and the likelihood of hitting the limit:

- **Low risk:** Alt 2 and Alt 3 provide limited incentives on their own to fish differently.
- **Medium risk:** incentives are factored into complex inseason decisions.
- **High Risk:** there will be a strong incentive to avoid (all) chum.

Similar to status quo incentives.

Some new components, but all codified in regulations.

***In addition to status quo incentives:***

If the area is important to operations, harvesters will not want to risk being closed out.

Strength of incentives depends an assessment of the **likelihood** and **consequences** of hitting the cap. Consequences vary by sector.

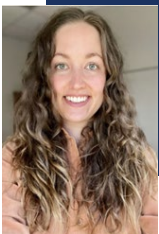
Does not necessarily incentivize Western Alaska chum avoidance but may provide it if the area closures have higher rates of Western Alaska chum.

Modified from Figure 1-5, page 16



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# Chum Salmon



# Total Chum Salmon Bycatch, Alternative 1

Section 3.2.4.1.2

**Table 3-11 Chum salmon bycatch (number of fish) during the B season pollock fishery broken out by sector and fleet total, 2011–2023**

<b>Year</b>	<b>CDQ</b>	<b>CP</b>	<b>Mothership</b>	<b>Inshore</b>	<b>Total</b>
2011	3,758	44,299	24,399	118,857	191,313
2012	200	1,928	977	19,067	22,172
2013	554	10,229	3,835	110,496	125,114
2014	2,407	63,066	8,091	145,322	218,886
2015	4,650	40,046	14,046	174,343	233,085
2016	15,975	134,750	43,629	144,882	339,236
2017	87,058	207,355	16,825	154,610	465,848
2018	26,586	99,447	21,303	147,339	294,675
2019	15,726	113,287	44,860	172,798	346,671
2020	8,582	77,137	19,743	237,632	343,094
2021	55,663	97,917	50,542	341,779	545,901
2022	6,365	71,786	32,262	131,896	242,309
2023	3,358	22,499	19,099	66,887	111,843
<b>Average</b>	<b>17,760</b>	<b>75,673</b>	<b>23,047</b>	<b>151,224</b>	<b>267,704</b>

Source: NMFS Alaska Region CAS, data compiled by AKFIN.



# Genetic Cluster Areas

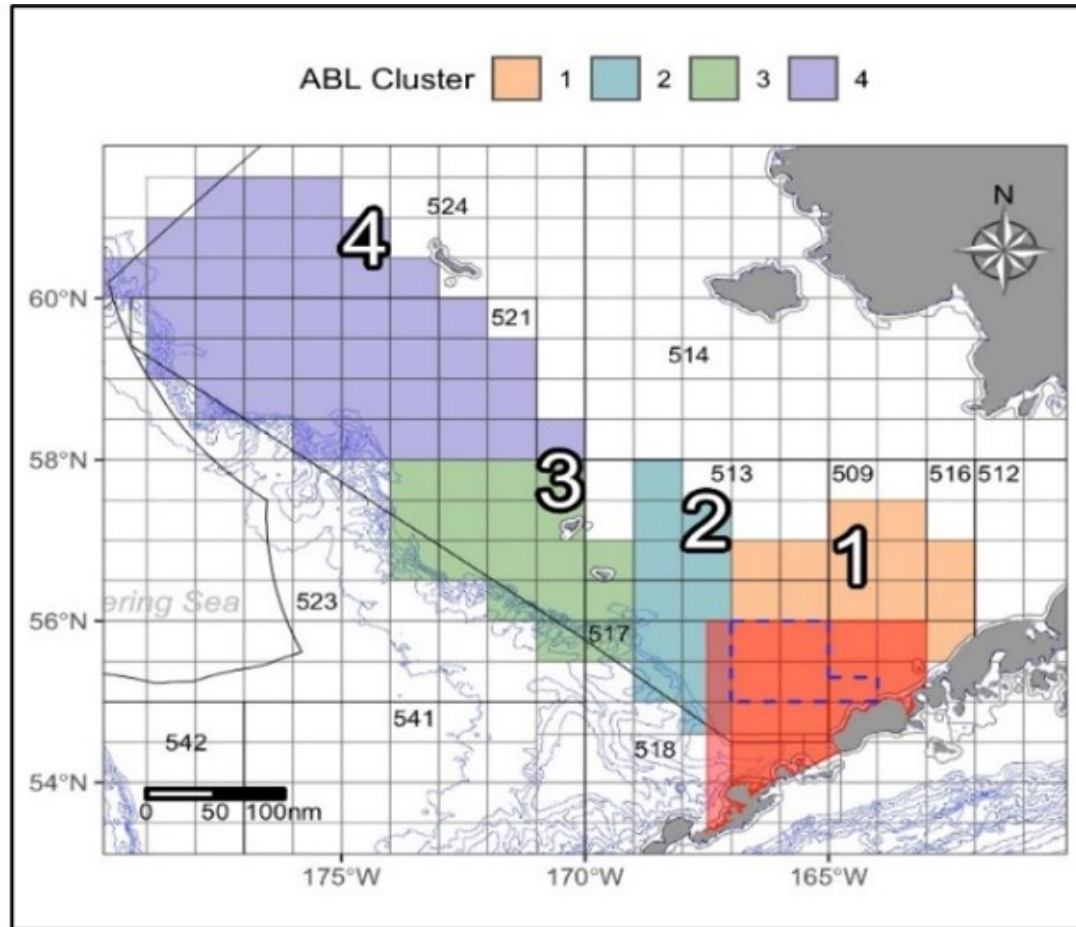


Figure 1-6 Map of four genetic cluster areas as well as the CVOA (red) and Chum Salmon Savings Area (blue dotted line)



# Overall B Season Bycatch and by Cluster Area, Alternative 1

Section 3.2.4.1.2

**Overall B season chum salmon bycatch and B Season bycatch in each cluster area**

<b>Year</b>	<b>B Season</b>	<b>Cluster 1</b>	<b>Cluster 2</b>	<b>Cluster 3</b>	<b>Cluster 4</b>
<b>2011</b>	191,313	121,513	20,225	28,887	20,476
<b>2012</b>	22,172	15,278	3,612	1,871	868
<b>2013</b>	125,114	77,426	18,862	23,159	5,492
<b>2014</b>	218,886	75,617	55,573	52,775	34,652
<b>2015</b>	233,085	151,037	15,604	47,917	18,527
<b>2016</b>	339,236	201,352	85,455	44,764	7,665
<b>2017</b>	465,848	171,567	234,346	34,739	25,196
<b>2018</b>	294,675	104,034	109,614	74,323	6,689
<b>2019</b>	346,671	164,647	42,315	62,095	77,536
<b>2020</b>	343,094	118,396	64,412	108,420	48,598
<b>2021</b>	545,901	221,859	274,805	41,787	7,438
<b>2022</b>	242,309	150,305	30,922	46,661	14,421
<b>2023</b>	111,852	56,997	8,745	10,418	35,624
<b>Average</b>	<b>267,704</b>	<b>125,387</b>	<b>74,192</b>	<b>44,447</b>	<b>23,322</b>

*Slightly modified from Table Ad-2*



# Overall B Season Bycatch by Sector and Cluster Area, Alternative 1

Section 3.2.4.1.2



**Figure 3-11 Pollock sector's B season chum salmon bycatch (numbers of fish) by Cluster Area, 2011–2023**



# Proportion of Western Alaska Chum Salmon by Cluster Area, Alternative 1

Section 3.2.4.1.3

**Table 3-14 Estimated mean proportion of Western Alaska chum salmon in the overall bycatch in the Early and Late periods of the B season by genetic cluster area, 2011–2023**

Year	Cluster Area 1		Cluster Area 2		Cluster Area 3		Cluster Area 4	
	Early	Late	Early	Late	Early	Late	Early	Late
2011	32.8%	25.5%	-	7.6%	28.7%	22.2%	30.1%	-
2012	26.9%	23.5%	-	-	-	-	-	-
2013	25.8%	22.1%	24.1%	19.7%	17.7%	29.5%	-	7.6%
2014	24.9%	23.3%	25.8%	19.5%	16.1%	16.1%	-	8.0%
2015	32.0%	22.3%	17.2%	6.5%	23.8%	18.3%	11.1%	3.4%
2016	31.1%	29.0%	26.2%	16.3%	10.6%	18.5%	-	16.7%
2017	29.5%	29.8%	18.4%	10.0%	12.9%	-	11.9%	7.1%
2018	31.8%	22.1%	16.8%	17.3%	16.0%	13.1%	-	0.9%
2019	33.6%	18.5%	10.5%	17.3%	11.9%	18.5%	4.5%	5.2%
2020	10.5%	14.4%	9.2%	3.2%	10.3%	5.2%	8.3%	2.0%
2021	9.4%	17.7%	8.4%	-	12.9%	8.2%	-	-
2022	26.5%	29.9%	14.2%	11.4%	9.1%	12.4%	-	2.2%
2023	16.3%	14.3%	10.3%	9.6%	6.1%	22.2%	4.0%	2.2%



# Simplified Chum Salmon Adult Equivalents (AEQ) Analysis

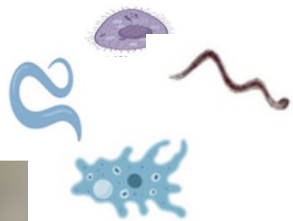
Section 3.2.4.1.4

**Goal:** to estimate the number and impact (proportion of a total run size) of bycaught salmon that may have otherwise survived the marine environment and returned to natal streams

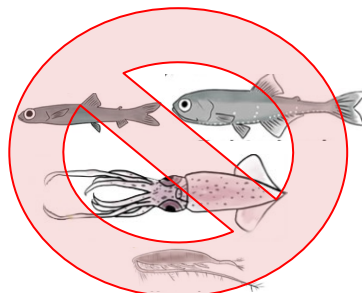
## Discounts natural mortality

## Accounts for maturation

Current and prior years' bycatch that is expected to mature at a given age



Disease/  
Parasites



Starvation



Predation





# Information Needed for an Adult Equivalents (AEQ) Analysis

Section 3.2.4.1.4  
Appendix 4

1. Number of chum salmon caught as bycatch
2. Genetic stock composition estimates
  - *How many chum salmon originated from WAK river systems*
3. Ocean mortality estimate
  - *How many would have naturally died in the ocean*
4. Ages of chum salmon in the bycatch
  - *How many would mature each year*
5. Maturity estimate by river system
  - *% by age that would return to the river*

**High degree of uncertainty #3-5**



# AEQ Estimates Compared to B Season Bycatch, Alternative 1

Modified table A-6 from Appendix 4, Annual AEQ and B season chum salmon bycatch estimates for the WAK genetic groups, 2011-2022

Year	Total B Season Bycatch	CWAK		Upper/Mid Yukon	
		B season	AEQ	B season	AEQ
2011	191,311	31,623	21,848	14,276	10,564
2012	22,172	3,152	11,608	1,407	3,126
2013	125,114	27,364	20,815	3,643	2,629
2014	218,886	40,137	31,784	3,171	3,145
2015	233,085	37,090	31,011	6,805	5,239
2016	339,236	67,062	51,950	12,892	11,695
2017	465,848	82,103	69,445	15,495	16,429
2018	294,675	53,245	56,015	5,657	7,967
2019	346,671	55,338	53,739	1,022	2,387
2020	343,094	28,001	25,849	2,854	2,123
2021	545,901	45,976	32,750	4,093	4,939
2022	242,309	52,280	51,101	3,482	2,637

## From 2011-2022:

- Average AEQ CWAK was 38,162 chum
- Average AEQ Upper/Mid Yukon was 6,074 chum
- CWAK AEQ estimate exceeds B season estimate in 2012 and 2018
- Upper/Mid Yukon AEQ estimate exceeds B season estimate in 2012, 2017, 2018, 2019, and 2021



# Impact of Bycatch on Upper/Middle Yukon (Fall) Chum, Alternative 1

**An AEQ analysis is not a complete assessment on the potential impact bycatch**

- Upper/Mid Yukon reporting group aligns with Yukon fall chum salmon stock

$$\text{Impact rate} = \text{AEQ} / (\text{AEQ} + \text{run size})$$

Year	AEQ Upper/Middle Yukon bycatch	Fall chum run size	Impact rate
2011	10,565	1,244,141	0.84%
2012	3,126	1,089,200	0.29%
2013	2,629	1,215,809	0.22%
2014	3,145	956,669	0.33%
2015	5,239	828,453	0.63%
2016	11,695	1,390,329	0.83%
2017	16,429	2,315,883	0.70%
2018	7,967	1,114,684	0.71%
2019	2,387	802,964	0.30%
2020	2,124	184,233	1.14%
2021	4,939	95,249	4.93%
2022	2,638	242,465	1.08%

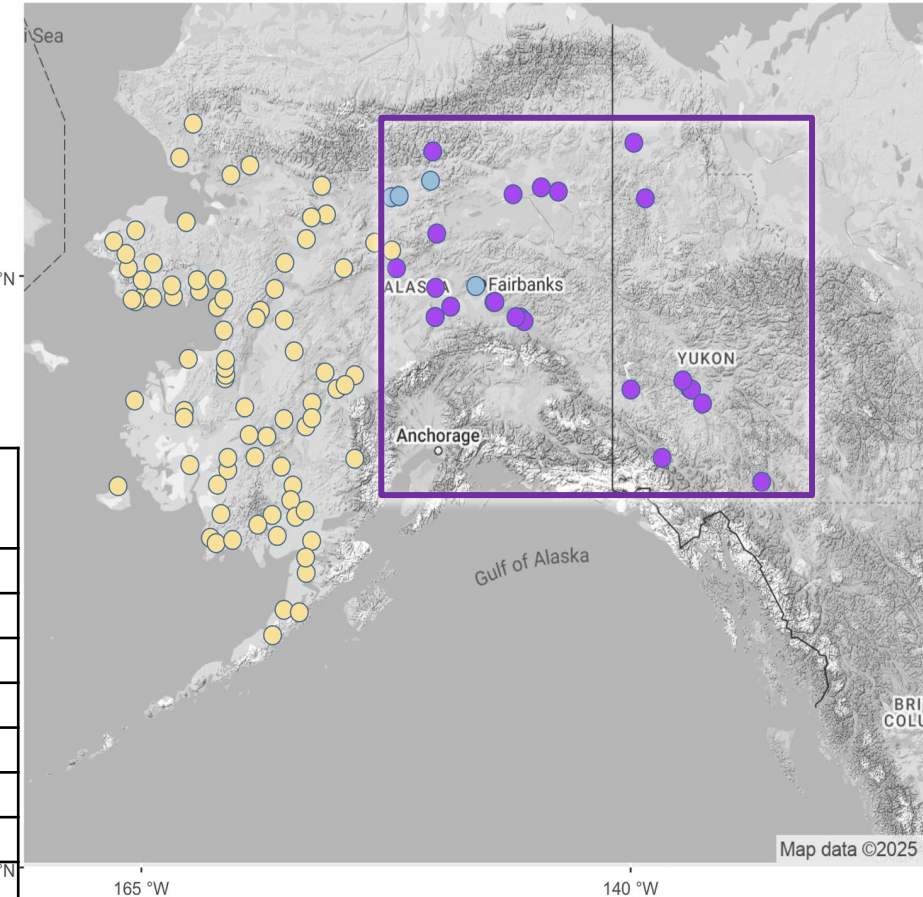


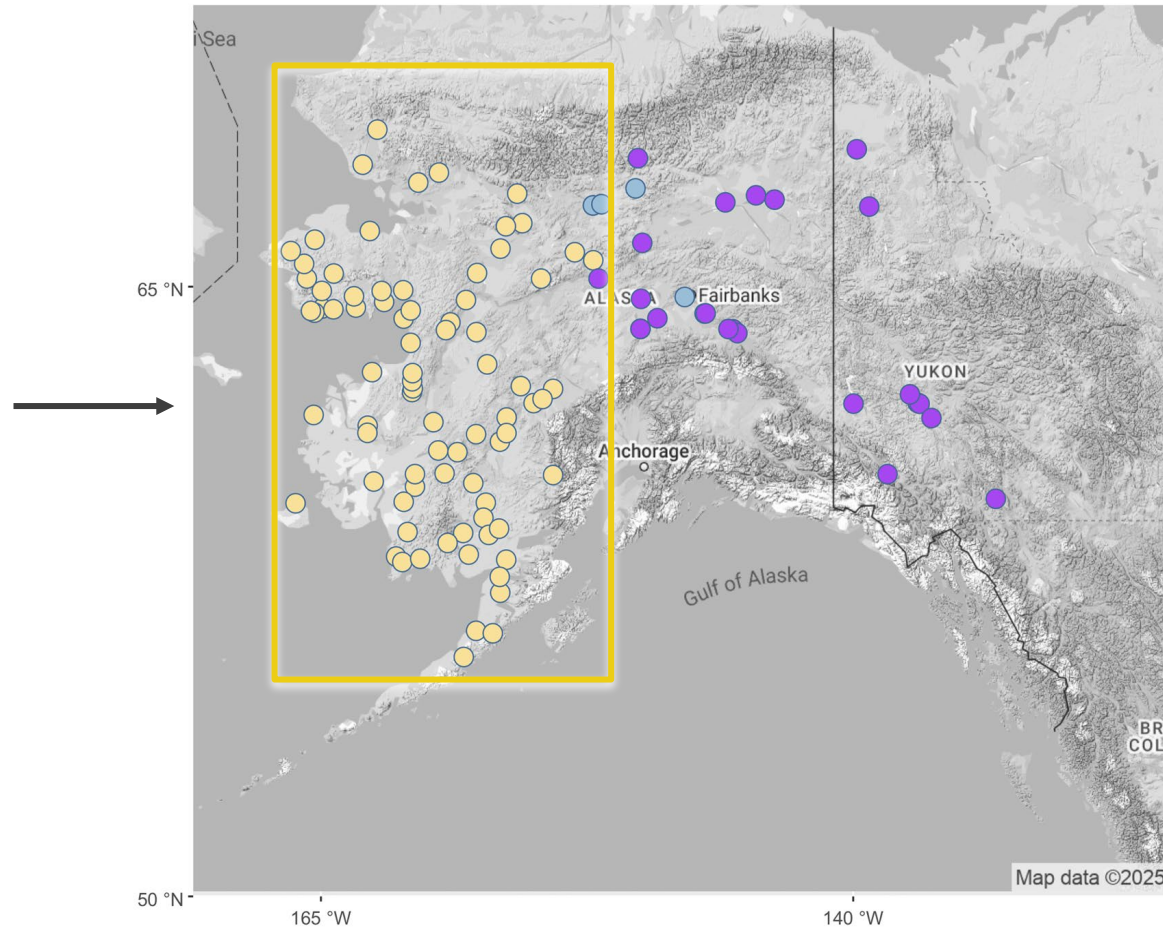
Table 3-16, pg. 102



# Approach Used for the CWAK Reporting Group, Alternative 1

Section  
3.2.4.1.2

Aggregate run size information is not available for the CWAK reporting group



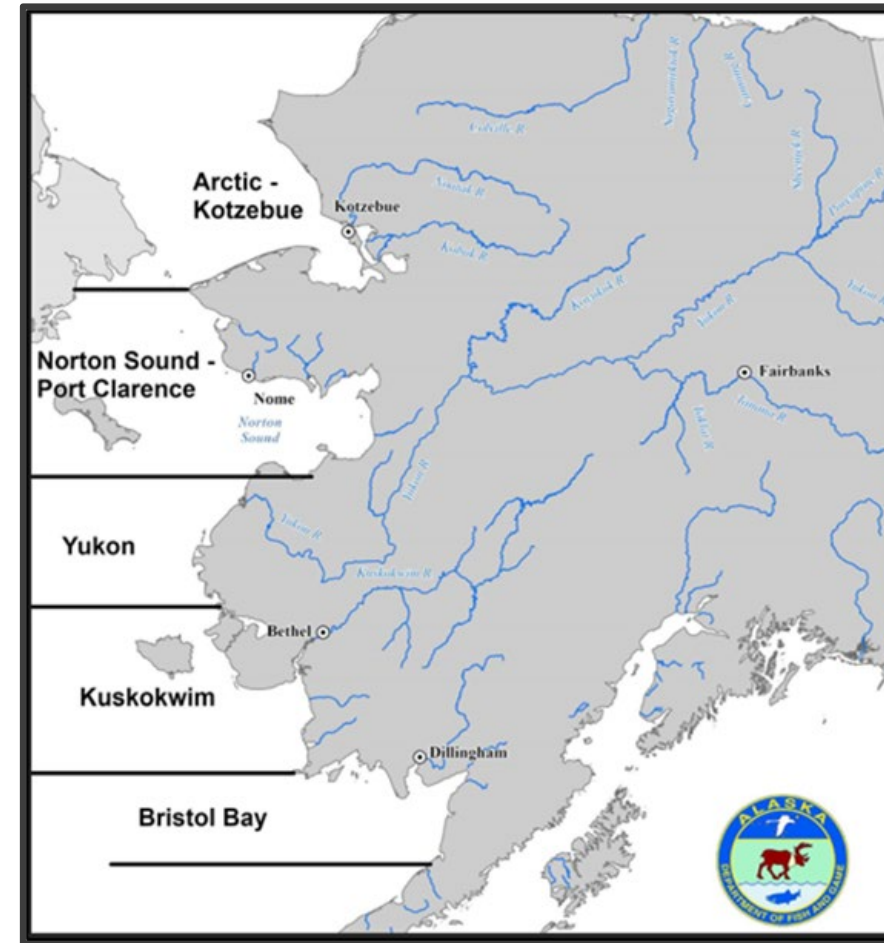


# Comparison of CWAK Bycatch to Other Sources of Removals

Section  
3.2.4.1.2

## Contextualize CWAK bycatch, but not intended to be used as an impact rate

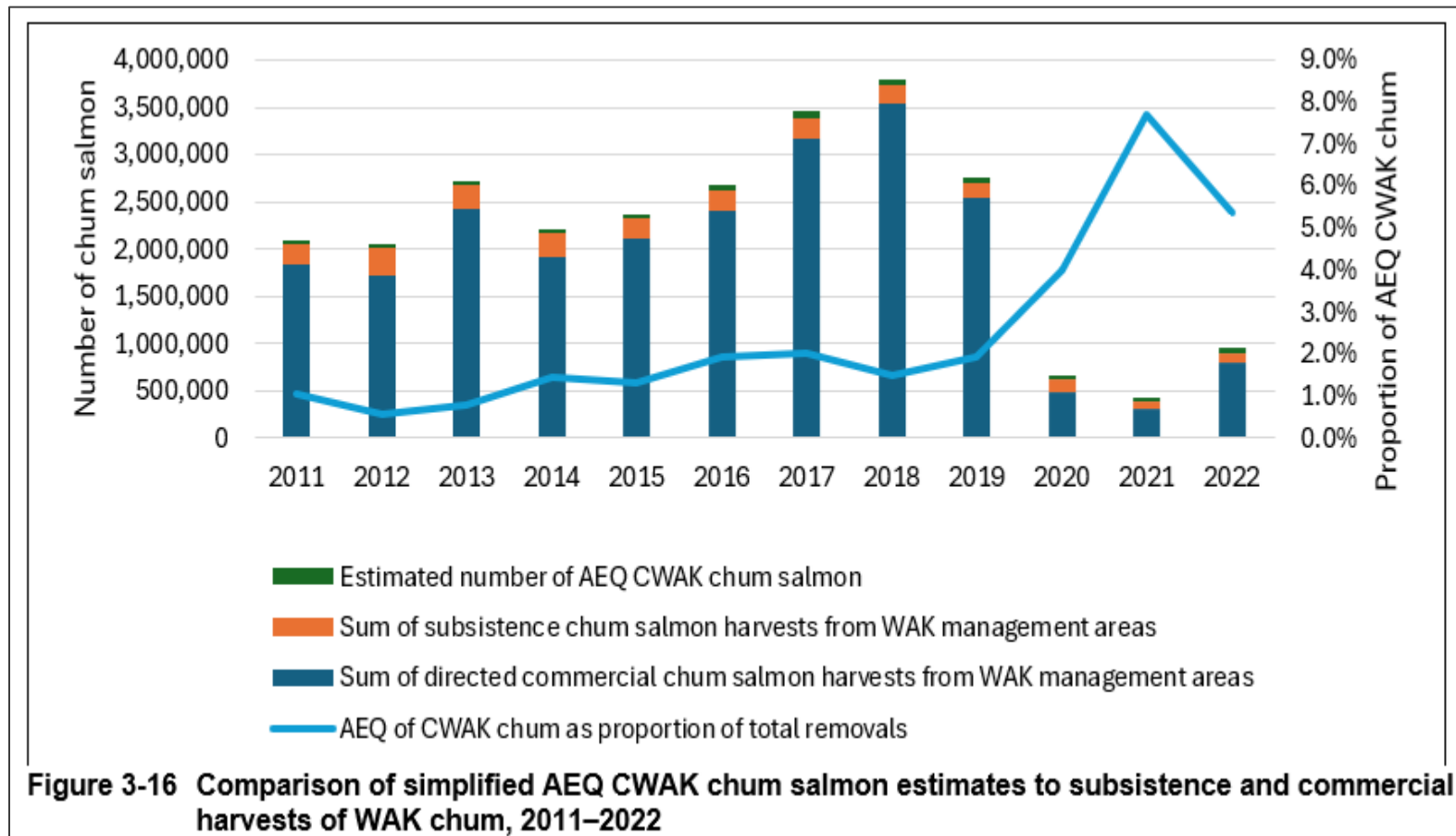
- AEQ CWAK estimates compared to commercial + subsistence harvests in Kotzebue, Norton Sound, Yukon, Kuskokwim, and Bristol Bay (2011-2022)
- Harvest levels reflect factors beyond abundance



# Scaling Bycatch Removals of CWAK Chum, Alternative 1

Section  
3.2.4.1.2

**AEQ CWAK fish caught as bycatch represented an average of 2.5% of total removals**



**Alternative 2 hard caps would have been a binding constraint for sectors in a variable number of years**

## **100,000 Chum Salmon Cap**

- CDQ in 5 or 6 years; CP in 10 or 11 years; mothership in 10 years; inshore in 12 years

## **325,000 Chum Salmon Cap**

- CDQ in 2 or 3 years; CP in 2-6 years; mothership in 4 years; inshore in 2 or 5 years

## **550,000 Chum Salmon Cap**

- CDQ in 2 years; CP in 1 or 2 years; mothership in 0 or 1 year; inshore in 0 or 1 years



# Total Chum Salmon Bycatch Reductions, Alternative 2

Section  
3.2.4.2.1

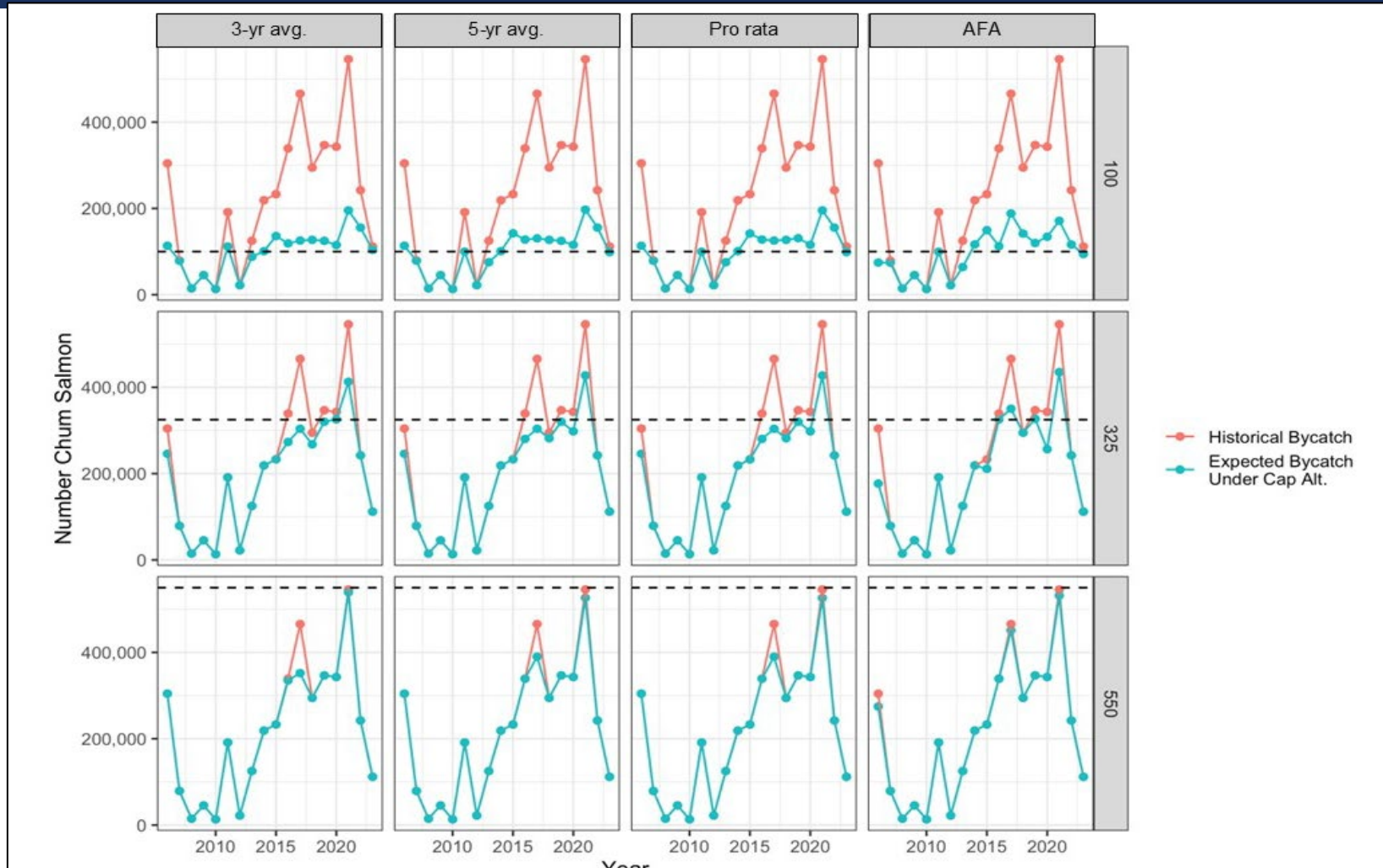


Figure 1-7 Historical B season chum salmon bycatch (red line) compared to estimated chum salmon bycatch under Alternative 2 PSC limit amounts (blue line) ranging from 100,000–550,000 chum salmon (black dotted line) and all apportionment options





# AEQ CWAK Chum Salmon Savings Estimates, Alternative 2

Section 3.2.4.2.3

Table 3-21 Estimates on AEQ CWAK chum salmon savings

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Average
100,000, 3-year avg.	8,564	3,946	5,962	14,651	14,501	30,571	47,862	36,365	33,606	16,440	21,226	24,877	21,548
100,000, 5-year avg.	9,854	4,540	7,895	15,626	14,211	29,274	46,722	35,986	33,544	16,429	21,150	24,816	21,671
100,000, pro rata	9,854	4,540	7,895	15,626	14,239	29,296	47,214	36,276	33,059	16,115	21,158	24,866	21,678
100,000, AFA	9,870	4,548	9,547	14,917	12,823	30,389	42,069	31,555	32,434	16,234	21,591	29,978	21,330
325,000, 3-year avg.						7,192	19,595	12,221	5,846	2,000	5,594	4,604	8,150
325,000, 5-year avg.						6,420	19,151	10,911	4,993	2,193	5,842	4,520	7,719
325,000, pro rata						6,420	19,151	10,911	4,993	2,193	5,842	4,520	7,719
325,000, AFA					1,461	2,668	12,232	6,724	3,074	2,199	6,670	4,848	4,985
550,000, 3-year avg.						439	11,109	6,510	1,296	69	240	214	2,840
550,000, 5-year avg.							7,223	4,306	861	46	710	634	2,297
550,000, pro rata							7,223	4,306	861	46	717	641	2,299
550,000, AFA							1,398	833	166	9	515	460	564

Savings are less affected by apportionment option compared to cap amount



# AEQ Upper/Middle Yukon Savings Estimates, Alternative 2

Section 3.2.4.2.3

Table 3-22 Estimates on AEQ Upper/Middle Yukon chum salmon savings

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Average
100,000, 3-year avg.	4,263	985	705	1,337	2,280	6,999	11,553	5,079	1,431	1,379	3,207	1,374	3,383
100,000, 5-year avg.	4,905	1,134	925	1,474	2,196	6,696	11,308	5,031	1,427	1,376	3,195	1,370	3,420
100,000, pro rata	4,905	1,134	925	1,474	2,203	6,701	11,441	5,065	1,425	1,369	3,203	1,374	3,435
100,000, AFA	4,913	1,136	1,108	1,470	2,020	7,019	9,969	4,451	1,306	1,289	3,255	1,594	3,294
325,000, 3-year avg.						1,759	4,969	1,588	296	131	867	300	1,416
325,000, 5-year avg.						1,570	4,888	1,373	212	238	916	295	1,356
325,000, pro rata						1,570	4,888	1,373	212	238	916	295	1,356
325,000, AFA					375	602	3,208	805	96	395	1,069	318	859
550,000, 3-year avg.						108	3,009	777	77	3	38	14	575
550,000, 5-year avg.							1,971	513	51	2	113	42	449
550,000, pro rata							1,971	513	51	2	114	42	449
550,000, AFA							382	99	10	1	82	30	101

Savings are less affected by apportionment option compared to cap amount



# Implications Specific to Alternative 3

Blue = hard cap in effect because index failed to meet the threshold in the prior year

Index	Threshold	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Three-area	25th											75% of 100-550k	75% of 100-550k	75% of 100-550k
	50th					100-550k	100-550k				100-550k	75% of 100-550k	75% of 100-550k	75% of 100-550k
Yukon	25th											100-550k	100-550k	100-550k
	50th						100-550k				100-550k	100-550k	100-550k	100-550k



# Implications Specific to Alternative 3 - 2

Section 3.2.4.2.4

Index	Threshold	2019	2020	2021	2022	2023
Three-area	25th			75% of 100-550k	75% of 100-550k	75% of 100-550k
	50th		100-550k	75% of 100-550k	75% of 100-550k	75% of 100-550k
Yukon	25th			100-550k	100-550k	100-550k
	50th		100-550k	100-550k	100-550k	100-550k

(Focus on recent years for illustration)

Year	Yukon		Kuskokwim (Bethel Test Fishery)	Norton Sound (Index + Total Harvest)
	Summer	Fall		
2011	2,406,000	1,244,141	10,028	202,421
2012	2,479,900	1,089,200	6,894	107,359
2013	3,349,600	1,215,809	5,739	188,104
2014	2,467,600	956,669	6,345	215,382
2015	1,978,400	828,453	2,945	259,441
2016	2,581,500	1,390,329	3,998	124,397
2017	3,635,100	2,315,883	6,785	324,148
2018	2,074,700	1,114,684	8,205	363,939
2019	1,689,400	802,964	6,429	234,270
2020	763,200	184,233	1,443	49,762
2021	156,130	95,249	327	21,735
2022	478,690	242,465	2,191	70,702
2023	896,850	318,687	4,304	38,469

Summed for Three-area index



# Impacts on Western Alaska Chum Salmon Bycatch, Alternative 2 and 3

Section  
3.2.4.2.4

## Uncertainty in whether a hard cap would reduce WAK chum salmon bycatch compared to status quo

- Hard caps create incentives for fishermen to avoid all chum – fishermen would target areas with low bycatch rates (*all other factors being equal*)
- Proportion of WAK chum in the total bycatch varies each year – ranging from 25.1% (2011) to 9.1% (2020), averaging 18.6%

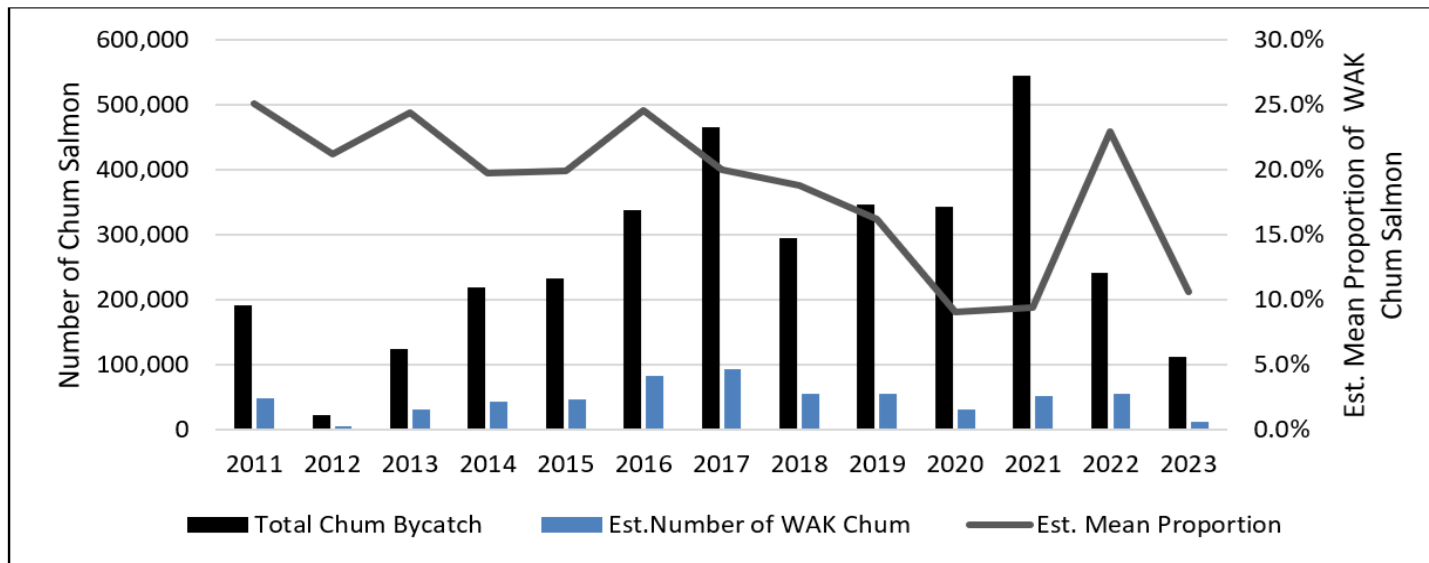


Figure 3-17 Comparison of the total B season chum salmon bycatch, estimated number of WAK chum salmon, and estimated mean proportion of WAK chum salmon in the overall bycatch from 2011–2023



# Impacts on Chum and Western Alaska Chum Salmon, Alternative 4

Section 3.2.4.3

Provision	Assessment
1. Describe the use of historical genetic information	<b>Yes</b> – Explicit consideration of likelihood that WAK chum could be avoided, but may not always need to prioritize closures
2. Evaluate closures more than once per week	<b>Yes</b> – Reduces the chance that PSC rates would increase without a response
3. Require excluder devices be used throughout B season	<b>No</b> – CP and MSSIP currently require and common practice for Inshore SSIP to use, but it would <i>update regs to align with current practices</i>
4. Require outlier provisions	<b>Yes</b> – Incentive to perform equal or better than peers to not lose operational flexibility in future years.
5. Weekly reports to WAK chum salmon users	<b>No</b> – Focused on information sharing.
6. Prohibit fishing in areas with very high bycatch rates	<b>Yes</b> – Prohibits fishing in areas with “very high” PSC rates in addition to regular RHS closures. WAK chum savings depends on where the very high rate area is located and where vessels move to

Since 2021 B season bycatch of 545,901 chum:

- 2022 B season was a 55% reduction
- 2023 B season was an 80% reduction
- 2024 B season was a 95% reduction





# Initial Approach to Analyzing Alternative 5 – Fleet Movement Model

## Section 3.2.4.4.1.2

**Table 3-33 Proportion of weeks where a sector did not have any fishing history outside of a corridor after a closure would have occurred in each year, 2011–2023**

Year	Cluster 1			Unimak			Cluster 2		
	CP/CDQ	M	Inshore	CP/CDQ	M	Inshore	CP/CDQ	M	Inshore
2011	0%	0%	13%	-	0%	0%	-	-	-
2012	-	-	-	-	-	-	-	-	-
2013	0%	-	0%	-	-	0%	-	-	-
2014	-	-	0%	-	-	0%	-	-	0%
2015	-	-	3%	-	-	0%	-	-	-
2016	10%	82%	82%	0%	72%	5%	0%	-	-
2017	0%	30%	64%	-	30%	8%	0%	-	0%
2018	0%	0%	0%	-	0%	0%	0%	0%	0%
2019	-	-	44%	-	-	0%	-	-	-
2020	-	-	-	-	-	-	-	-	0%
2021	0%	74%	18%	-	45%	18%	0%	0%	0%
2022	0%	100%	56%	-	0%	30%	0%	-	-
2023	-	-	0%	-	-	0%	-	-	-

Source: NMFS Alaska Region CAS.

“-” indicates there was no closure for that given year, corridor, and sector.

“0%” indicates fishing in some weeks occurred both inside and outside of the corridor.

Values > 0% indicate that fishing in some weeks only occurred inside the corridor and there was no fishing outside of the corridor.

- Aimed to evaluate the impacts of closing a corridor and moving a sector to outside areas
- Several weeks where no pollock catch occurred outside of the corridor
- The results cannot be used as a predictor of fishing behavior or where the fleet may shift effort to in the event of a closure



# Proportion of Catch Inside Each Corridor, Alternative 5

Section  
3.2.4.4.1.3

**Table 3-36 Proportion of each sector's B season pollock harvest taken inside the corridor area during the closure window (June 10 to August 31), 2011–2023**

Year	Cluster 1			Unimak			Cluster 2		
	CP/CDQ	Mothership	Inshore	CP/CDQ	Mothership	Inshore	CP/CDQ	Mothership	Inshore
2011	3.33%	42.36%	69.64%	1.95%	38.21%	62.81%	12.41%	9.27%	9.69%
2012	2.55%	35.76%	41.98%	0.22%	24.40%	34.57%	7.30%	14.48%	9.20%
2013	0.43%	11.60%	47.01%	0.02%	8.05%	38.06%	3.96%	17.97%	20.71%
2014	3.55%	17.26%	69.42%	3.39%	15.56%	58.39%	10.99%	9.17%	12.05%
2015	0.52%	11.97%	87.38%	0.49%	8.79%	77.07%	13.56%	13.89%	9.06%
2016	35.56%	89.94%	98.34%	13.70%	58.38%	79.24%	35.18%	10.06%	1.66%
2017	10.78%	70.70%	89.78%	3.29%	55.07%	80.33%	48.69%	12.73%	10.22%
2018	7.59%	25.91%	80.36%	6.62%	23.01%	75.22%	14.84%	8.89%	14.55%
2019	7.86%	42.09%	91.18%	5.50%	35.02%	85.50%	16.57%	6.54%	3.29%
2020	0.01%	33.49%	63.72%	0.00%	32.15%	60.39%	5.75%	3.11%	8.49%
2021	3.47%	82.90%	90.25%	3.30%	76.43%	85.14%	15.36%	8.49%	6.61%
2022	4.26%	73.40%	92.65%	0.00%	56.55%	82.04%	29.25%	7.82%	6.33%
2023	1.92%	65.42%	67.70%	0.45%	61.08%	59.45%	4.82%	1.85%	6.03%

Source: NMFS Alaska Region CAS.





# Pollock Catch Displaced from Clusters 1 and 2

Section 3.2.4.4.1.3

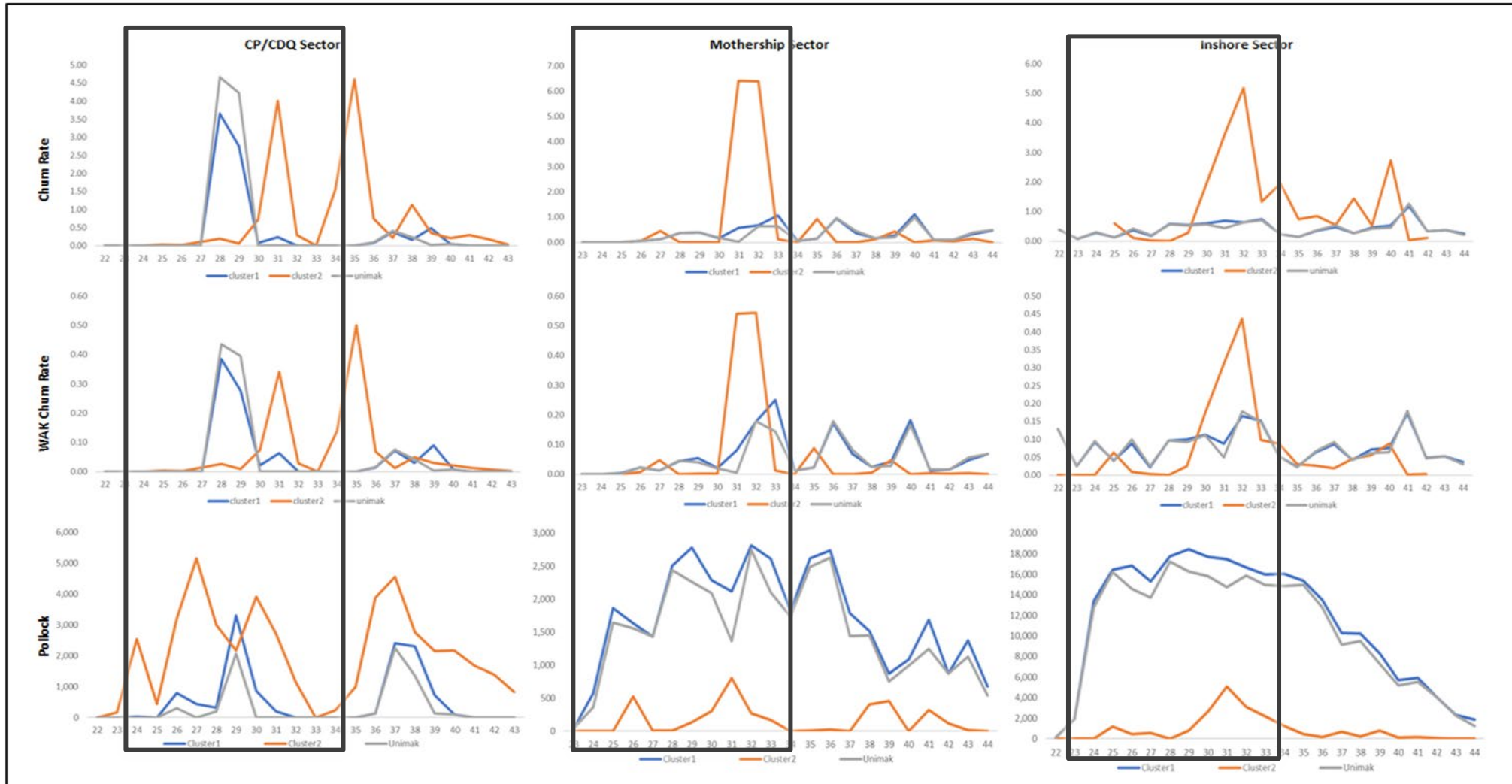
Cluster 1								
Limit	50,000				200,000			
Sector	CDQ	CP	M	CV	CDQ	CP	M	CV
<b>Sector Apportionment 1, 3-yr avg</b>								
2019				202,785				
2020								
2021			31,271	149,319				
2022		4,491	4,288	67,109	4,491	805		
2023				12,236				
<b>Sector Apportionment 2, 5-yr avg</b>								
2019				202,785				
2020								
2021	10,322		35,791	149,319				
2022		4,491	4,288	67,109		805		
2023				12,236				
<b>Sector Apportionment 3, pro rata</b>								
2019				202,785				
2020								
2021			31,271	149,319				
2022			4,288	88,803		805	88,730	
2023				12,236				
<b>Sector Apportionment 4, AFA</b>								
2019				217,504				
2020								
2021	10,322		35,791	173,975				103,845
2022			4,288	88,803		805	27,017	
2023				16,796				

Cluster 2								
Limit	50,000				100,000			
Sector	CDQ	CP	M	CV	CDQ	CP	M	CV
<b>Sector Apportionment 1, 3-yr avg</b>								
2019								
2020								
2021		3,139	973	9,459		3,139	973	9,459
2022	5,236	3,366			5,236			
2023								
<b>Sector Apportionment 2, 5-yr avg</b>								
2019								
2020								
2021		3,139	973	9,459		3,139	973	9,459
2022	5,236	3,366						
2023								
<b>Sector Apportionment 3, pro rata</b>								
2019								
2020				1,545				
2021		3,139	973	9,459		3,139	973	9,459
2022		3,366						
2023								
<b>Sector Apportionment 4, AFA</b>								
2019								
2020				1,545				
2021		3,139	973	9,459		3,139	973	9,459
2022								
2023								



# Chum and WAK Chum Salmon Bycatch Rates and Pollock Catch

Section 3.2.4.4.1.3



**Figure 3-22 Comparison of the weekly average WAK chum salmon rates, chum salmon PSC rates, and pollock harvest (mt) by sector and corridor under Alternative 5, 2019–2023**

Notes: CP and CDQ are combined.



# Factors Likely to Affect Movement Behavior

Section 3.2.4.4.1.3

- CPs and motherships have greater flexibility to move northwest
- CPs are prohibited from fishing AFA pollock inside the CVOA during the B season
- Inshore CVs must meet processor delivery requirements, and some small vessels have limited capacity to travel further from port
- Nearshore Bristol Bay Trawl Closure prohibits all pollock vessels from fishing further east
- Pollock vessels cannot fish around the Pribilof Islands encompassed in the Pribilof Islands Habitat Conservation Zone
- Fleet would not fish further directly west off the “shelf edge”

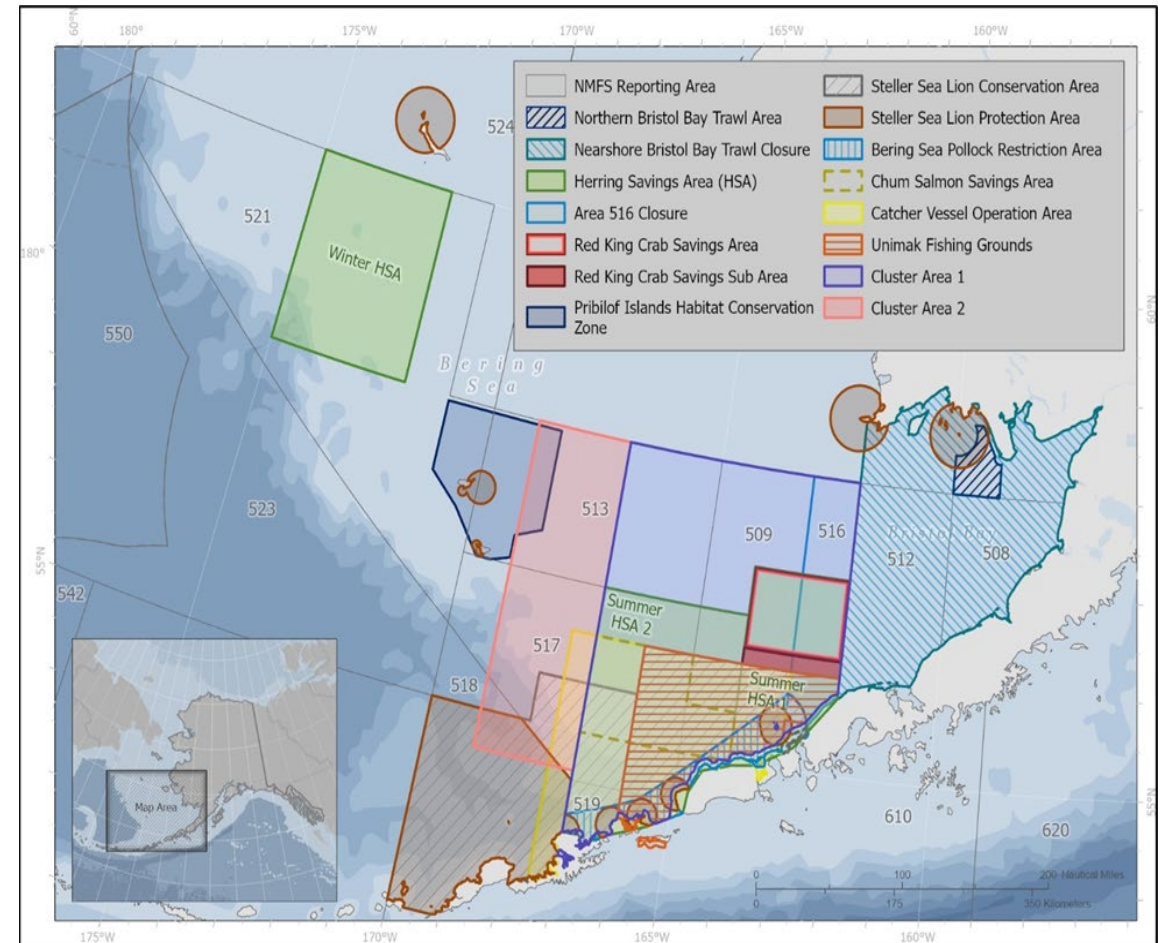


Figure 3-23 Inseason corridor areas under Alternative 5 and other relevant groundfish management area boundaries in the Bering Sea



# Potential Impacts on Chum and WAK Chum Salmon PSC

The corridors present different possibilities for potential benefits and unintended consequences

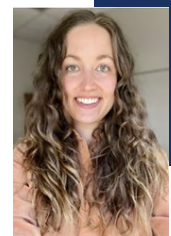
- Higher numbers of chum caught in Cluster 1/Unimak, but the bycatch rates are low.
  - high concentrations of pollock and catch**
- Bycatch rates are higher in Cluster 2 compared to Cluster 1/Unimak
- Large amounts of pollock moving from Cluster 1/Unimak to Cluster 2 presents a greater risk of potentially higher chum and WAK chum PSC

Resource Category	Chum Salmon Bycatch	WAK Chum Salmon Bycatch
Alt 5: time/area closures	Cluster 1	<p><b>Benefit Scenario:</b> vessels are stay below the cap inside Cluster 1, resulting in chum and WAK chum salmon savings.</p> <p><b>Unintended Consequence:</b> Some CVs fish outside of Cluster 1 (potentially in Cluster 2), or the cap is met, and CVs move to Cluster 2 where higher chum salmon bycatch.</p>
	Unimak	<p><b>Benefit Scenario:</b> Similar to Cluster 1 as Unimak is fully embedded within.</p> <p><b>Unintended Consequence:</b> Similar risk to Cluster 1 but potentially less because vessels <i>could</i> fish on the edge, inside Cluster 1; may not be feasible pending aggregations of pollock and other PSC considerations.</p>
	Cluster 2	<p><b>Benefit Scenario:</b> Sectors may proactively avoid fishing in area with historically high bycatch rates and/or carefully monitor PSC when fishing inside.</p> <p><b>Unintended Consequence:</b> Low risk to creating adverse outcomes compared to status quo and other corridors. Vessels expected to target fishing in historically common areas</p>



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# Chinook Salmon and Herring Bycatch





# Chinook Salmon Bycatch, Alternative 1

**Chinook Bycatch has been managed under hard caps since 2011 (Amendment 91), and with more stringent measures being implemented in 2016 (Amendment 110)**

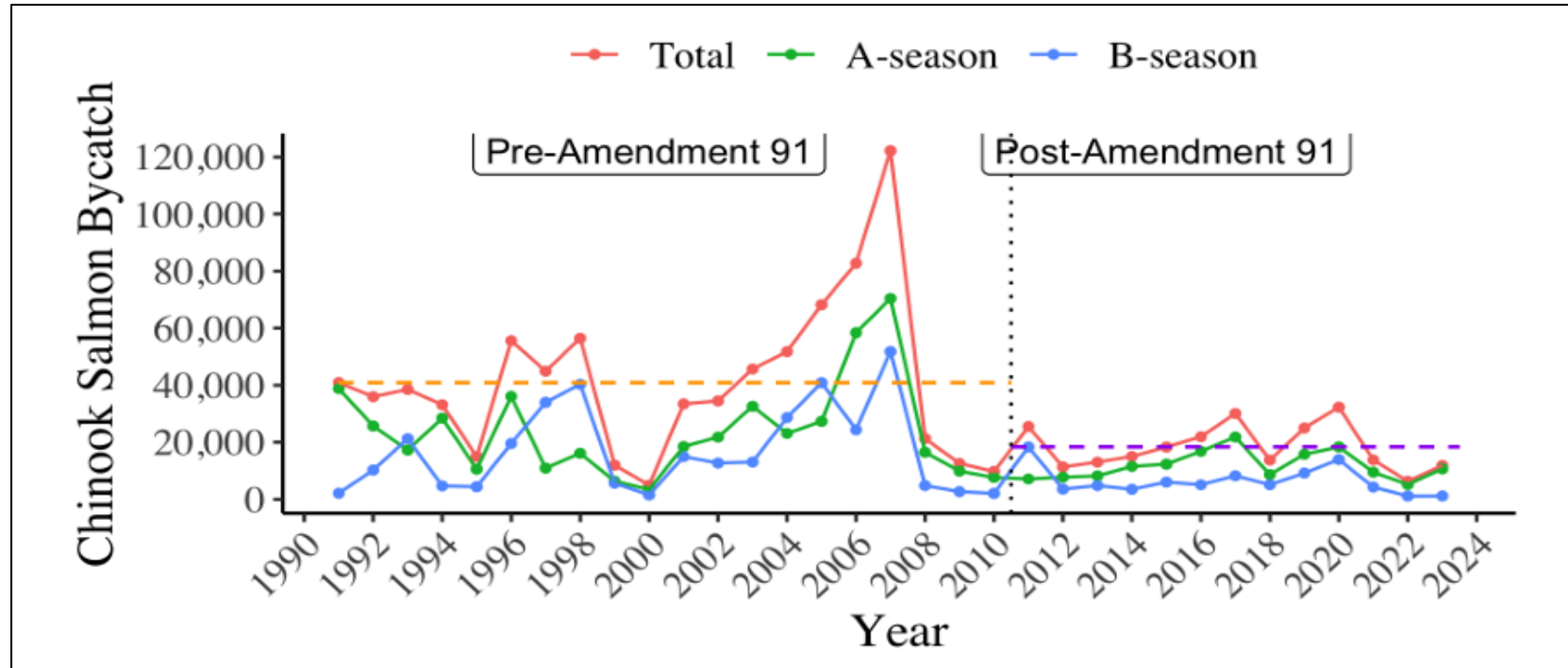


Fig 3-24



# Chinook Genetic Stock Composition Estimates

## Section 3.3

Chinook salmon caught as bycatch in the Bering Sea pollock fishery originate from river systems in Russia, Asia, across Alaska, and the Pacific Northwest

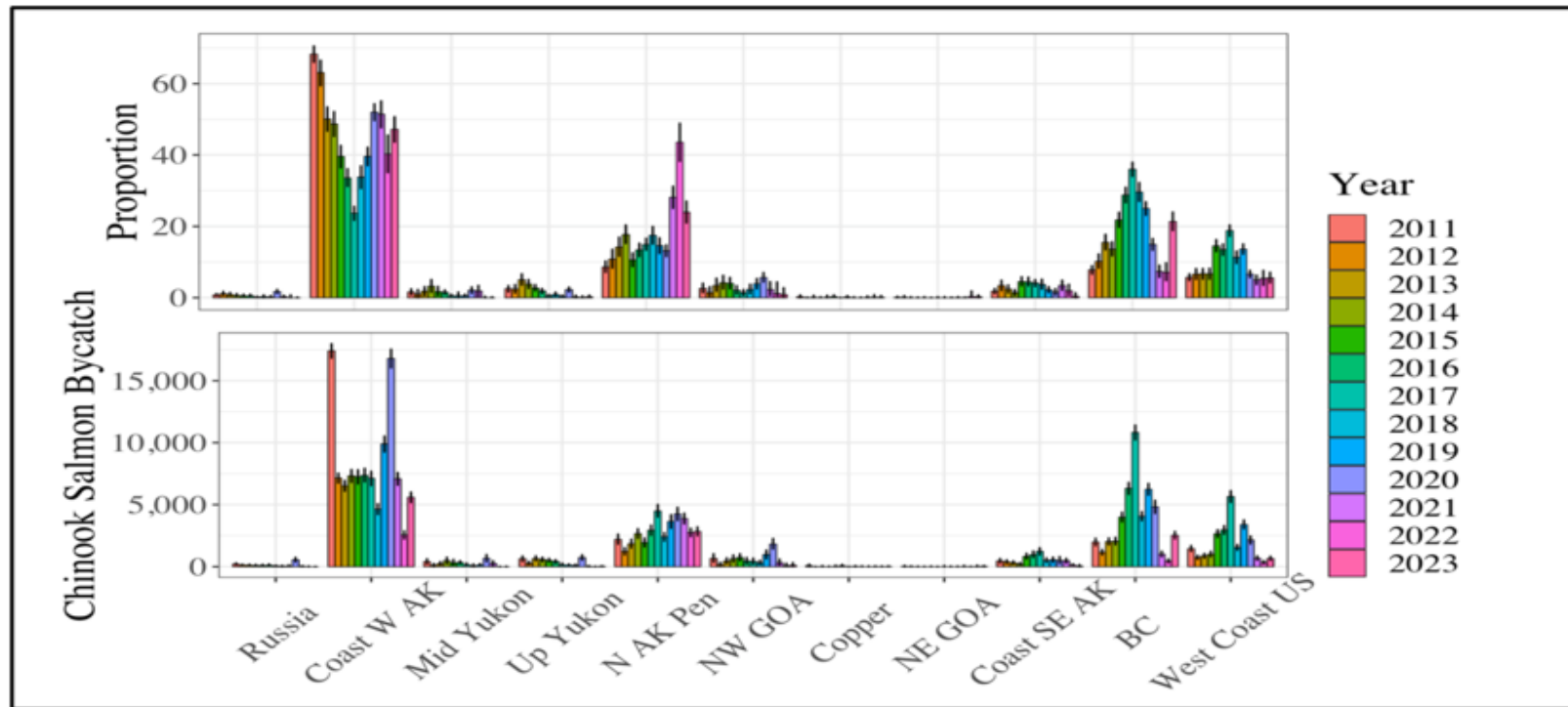
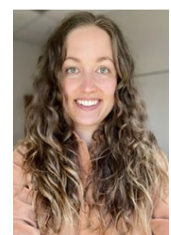


Figure 3-27 Annual stock composition estimates (top) and estimated number of Chinook salmon bycatch (bottom) with their 95% credible intervals (black line) in the Bering Sea pollock fishery, 2011–2023

Source: Barry et al. (2024)



# Impact of Chinook Salmon Bycatch, Alternative 1

**Table 3-42 Estimated impact (median and lower and upper 95% confidence intervals) for combined western Alaska stocks and Upper Yukon impact estimates by year of return (run-year), 2011–2023**

<b>Year</b>	<b>Upper Yukon</b>	<b>CWAK</b>
<b>2011</b>	0.4% (0.3% - 0.5%)	1.7% (1.6% - 1.8%)
<b>2012</b>	0.5% (0.4% - 0.6%)	2.5% (2.3% - 2.8%)
<b>2013</b>	0.6% (0.5% - 0.8%)	2.3% (2.1% - 2.6%)
<b>2014</b>	0.4% (0.3% - 0.6%)	2.2% (2.0% - 2.4%)
<b>2015</b>	0.3% (0.3% - 0.4%)	1.4% (1.2% - 1.5%)
<b>2016</b>	0.4% (0.3% - 0.5%)	1.6% (1.5% - 1.7%)
<b>2017</b>	0.3% (0.3% - 0.4%)	1.6% (1.5% - 1.8%)
<b>2018</b>	0.3% (0.2% - 0.4%)	1.4% (1.2% - 1.5%)
<b>2019</b>	0.2% (0.2% - 0.3%)	1.2% (1.1% - 1.3%)
<b>2020</b>	0.7% (0.6% - 0.9%)	3.6% (3.4% - 3.8%)
<b>2021</b>	0.8% (0.6% - 1.0%)	3.0% (2.8% - 3.4%)
<b>2022</b>	1.1% (0.9% - 1.5%)	2.1% (1.8% - 2.3%)
<b>2023</b>	0.8% (0.6% - 1.0%)	1.7% (1.6% - 1.9%)





# Impacts on Chinook Salmon Bycatch, Alternatives 2 and 3

Section 3.3.3

## Potential impacts are varied

- How the pollock fleet reacts to chum hard cap would determine outcomes for Chinook
- A primary consideration is whether pollock catch would be diverted to later weeks
- Timing of Chinook and chum encounters are dissimilar
- Alternative 3 poses less risk compared to Alternative 2

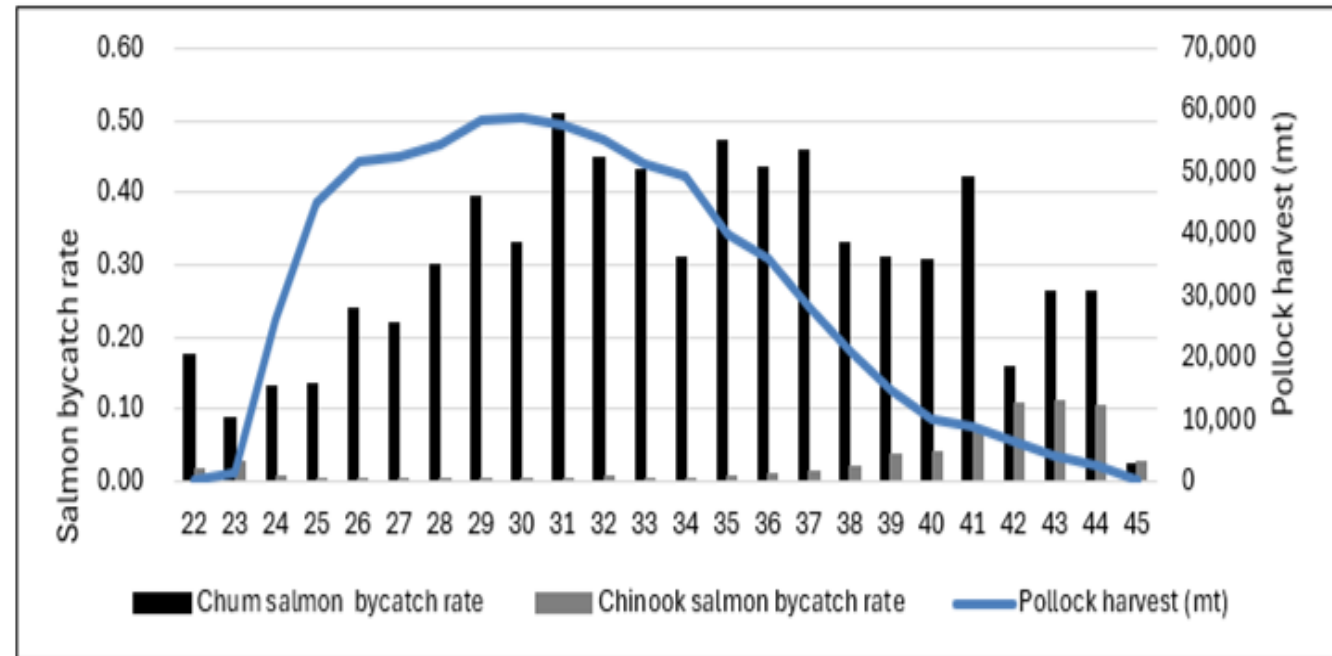


Figure 3-29 Comparison of the weekly fleet-wide weekly average chum salmon bycatch rate, Chinook salmon bycatch rate, and pollock harvest (mt), 2011-2023

Source: NMFS Alaska Region CAS, data compiled by AKFIN.



## **Modifications to existing IPA regulations would not be expected to result in adverse impacts to Chinook salmon PSC**

- IPAs in effect since 2010
- Measures implemented in response to proposed provisions have been in effect in recent years
- *“The restrictions or performance criteria used to ensure that Chinook salmon PSC rates in October are not significantly higher than those achieved in the preceding months.” - 50 CFR 679.21(f)(12)(iii)(E)(13)*



# Impacts on Chinook Salmon Bycatch, Alternative 5

**Table 3-44 Comparison of pollock harvest (mt), Chinook salmon PSC (number of fish), and Chinook salmon PSC rate during June and July, August, and September–November 1, 2019–2023**

Category	Year	Cluster Area 1			Unimak			Cluster Area 2		
		June   July	Aug	Sep   Nov	June   July	Aug	Sep   Nov	June   July	Aug	Sep   Nov
Pollock	2019	132,998	131,409	114,612	129,590	127,878	88,296	24,968	8,206	42,559
	2020	36,976	71,607	127,079	36,651	64,714	122,547	6,484	24,404	17,638
	2021	190,748	102,482	83,084	183,349	97,763	74,997	21,918	11,325	47,985
	2022	208,839	70,337	16,025	169,179	63,857	14,844	90,268	3,538	6,403
	2023	160,372	30,769	77,587	134,365	29,146	74,932	14,088	21,814	462
Chinook PSC	2019	2,626	591	1,914	580	2,589	1504	25	73	1,662
	2020	255	390	7,071	388	240	6,711	75	12	1,558
	2021	348	757	1,589	729	333	1,511	13	111	459
	2022	343	394	99	328	331	93	3	89	12
	2023	36	433	453	419	33	439	43	63	3
Chinook salmon PSC rate	2019	0.020	0.004	0.017	0.004	0.020	0.017	0.001	0.009	0.039
	2020	0.007	0.005	0.056	0.011	0.004	0.055	0.012	0.000	0.088
	2021	0.002	0.007	0.019	0.004	0.003	0.020	0.001	0.010	0.010
	2022	0.002	0.006	0.006	0.002	0.005	0.006	0.000	0.025	0.002
	2023	0.000	0.014	0.006	0.003	0.001	0.006	0.003	0.003	0.006

Source: NMFS Alaska Region CAS, data compiled by AKFIN.



# Impacts on Chinook Salmon Bycatch, Alternative 5

## Section 3.3.4

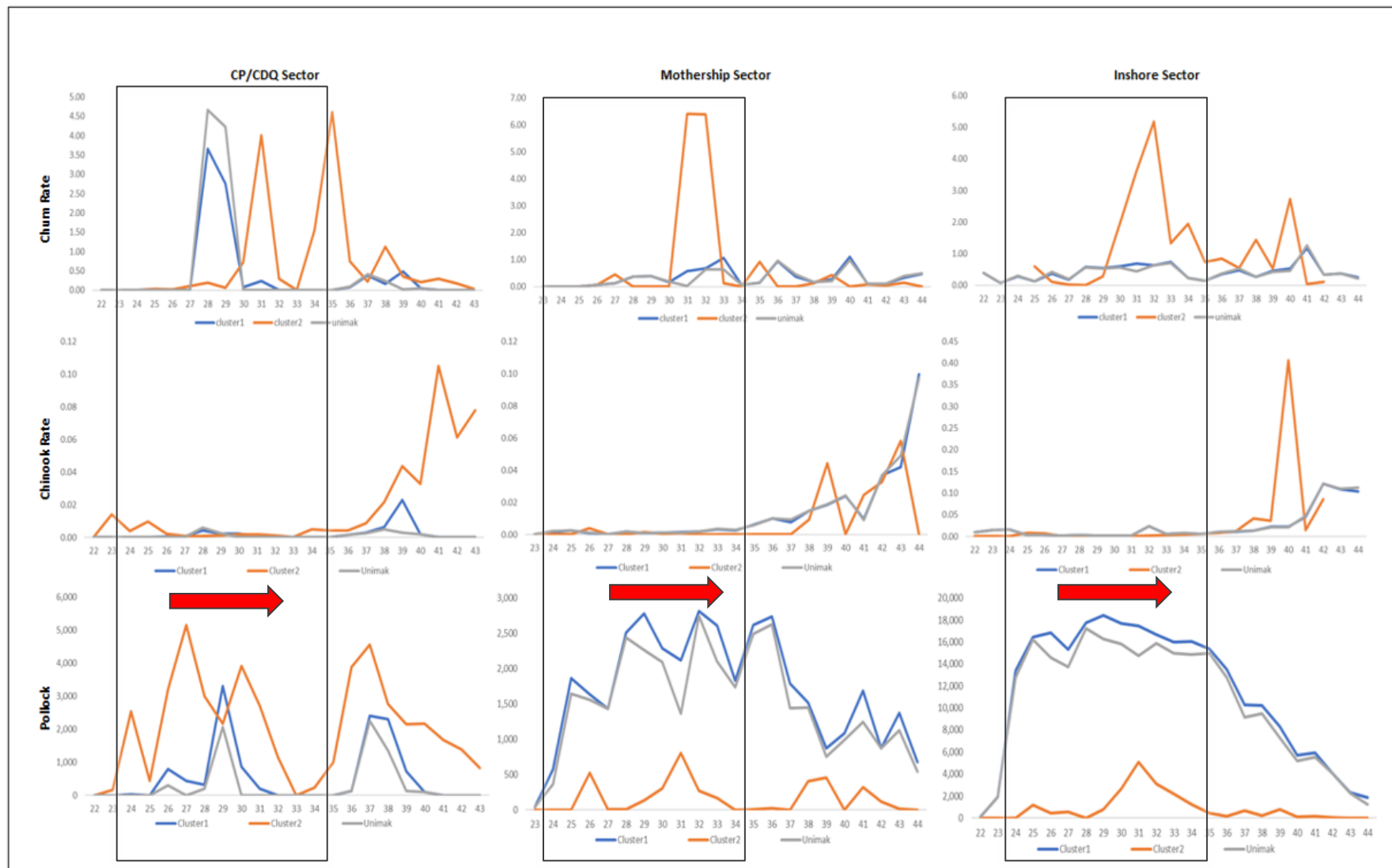


Figure 3-30 Distribution of the average weekly chum salmon PSC rate, Chinook salmon PSC rate, and pollock harvest (mt) for each corridor area by sector, 2019–2023



# Impacts on Herring Bycatch, Alternatives 2–5

## Potential impacts are varied

- Herring PSC managed under time/area closures triggered by a PSC limit
  - PSC typically higher in B season compared to A season
  - Encounters are variable within a year, creating potential for unintended, adverse effects under Alternatives 2, 3, and 5
  - Fishery may inadvertently trigger the HSAs while avoiding chum salmon

## Uncertainty in the potential outcomes

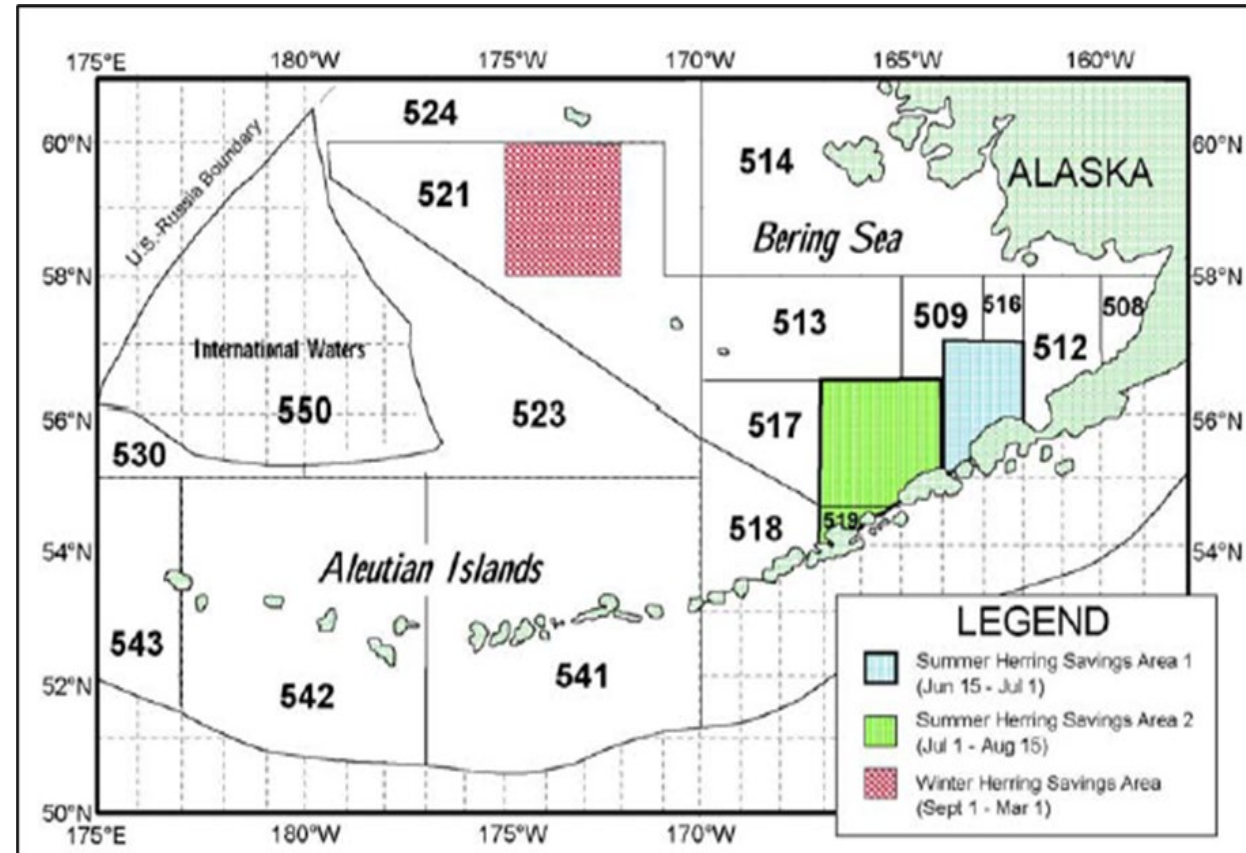


Figure 3-32 Herring Savings Areas







Dutch Harbor, ASMI Industry and Partner Use

# Social and Economic Assessment (Chapter 4)

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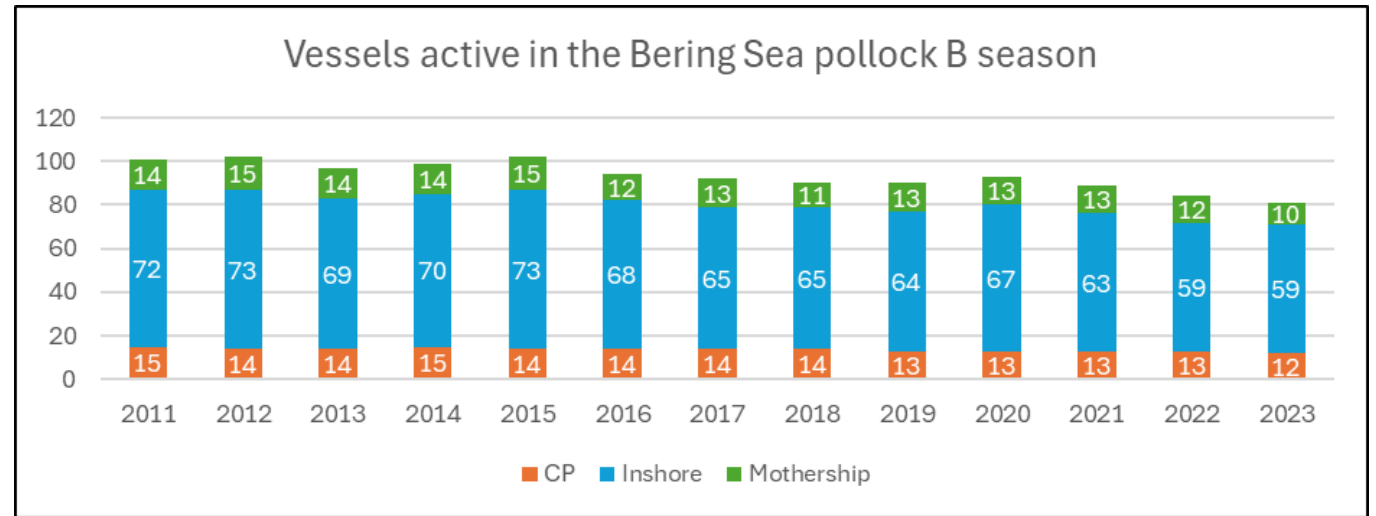
# Bering Sea Pollock Fishery



# Impacts to the Pollock Fishery, Alternative 1

## Section 4.1 – Current pollock fishery participation and conditions

- AFA sectors, harvests, associated communities, market conditions
- CDQ groups and communities, AFA investments, community benefit programs



**Selection of Alternative 1 would retain existing chum salmon bycatch regulations, and existing economic and social trends would be expected to continue into the future**

- Challenging market dynamics, operational costs, and other external factors may affect the pollock fishery and communities in the future, ***but the choice of Alternative 1 (maintaining current regulations) would not inherently create these changes***





# Impacts to the Pollock Fishery, Alternative 2 and 3- **Prior to a Closure**

**Potential impacts may occur prior to and regardless of an early B season closure because of the risk of a closure.**

- Analytical focus is on operational changes and potential **avoidance costs**. For example,
  - decreased operational efficiency from increased travel and/or moving out of areas of good fishing,
  - increased travel costs,
  - extended season and associated costs,
  - adverse effects on crew and crew compensation,
  - slower or interrupted deliveries to shoreplants,
  - potentially lower quality products from having to travel further and if so,
  - lower tax revenue for communities.



# Impacts to the Pollock Fisheries, Alternative 2 and 3- Closure Impacts

- The likelihood and potential magnitude of these impacts are anchored by **forgone revenue** analysis.
- Provides an upper bound on possible closures and possible direct forgone revenue.
- Max forgone wholesale revenue potential of \$714 million across fleet (2018 with AFA apportionment).

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

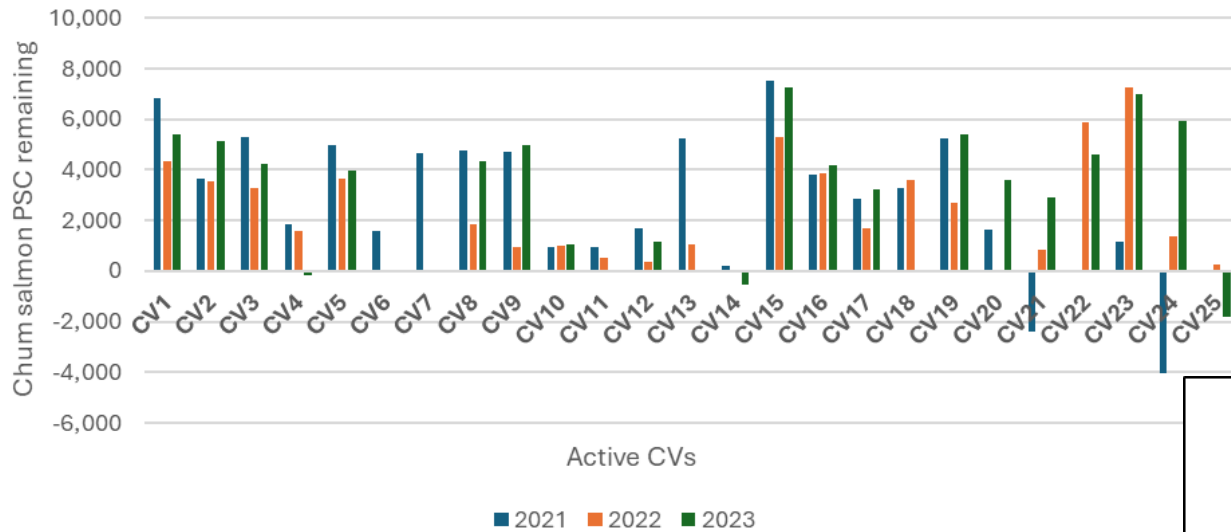
Sector	Apportionment	100,000 PSC limit			325,000 PSC limit			550,000 PSC limit		
		Number of years closed (out of 13)	Average forgone revenue (million of 2022\$)	% reduction in average B season forgone revenue	Number of years closed (out of 13)	Average forgone revenue (million of 2022\$)	% reduction 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%

Table 1-7, page 27



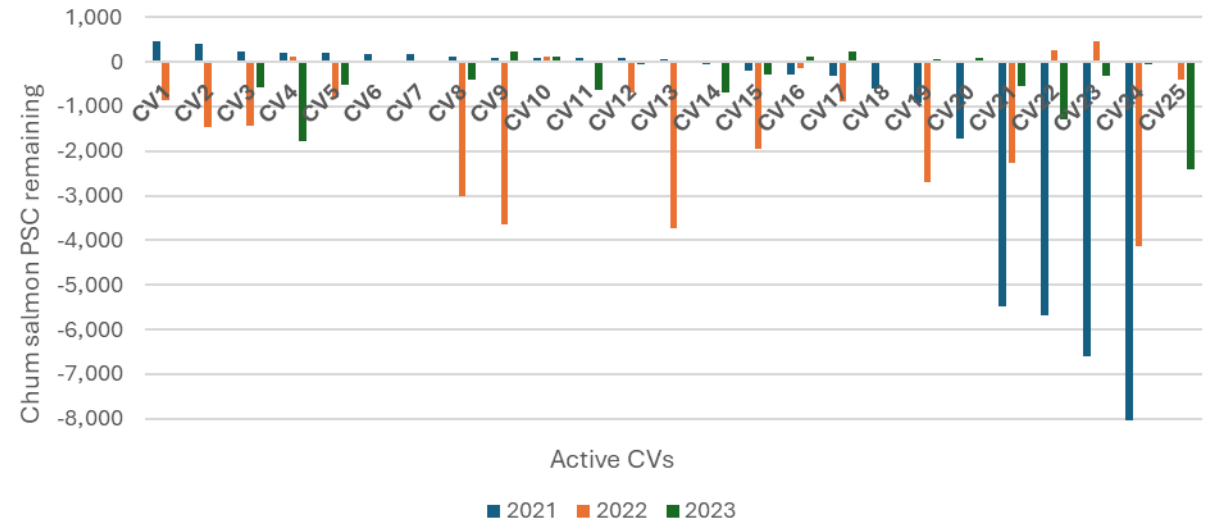
# Impacts to the Pollock Fisheries, Alternative 2 and 3- Vessel-Level Impacts

Active CVs in the Akutan Coop - highest limit/ apportionment



- A vessel-level impact analysis is provided in Appendix 6 using an extension of the retrospective methods and the inshore Chinook vessels apportionments as an example.

Active CVs in the Akutan Coop - lowest limit/ apportionment



# Impacts to the Pollock Fisheries, Alternative 2 and 3- **Broader Implications of a B season Closure**

**IF** a chum salmon PSC limit is met, likely broader implications of B season closures.

## **Shoreside processors impacts:**

- Impacts linked to the performance of the CVs that deliver to them
- High dependency on pollock, which has increased with declines in crab.
- Stability could impact processors' ability to process other species or could impact operations in non-pollock communities

## **CDQ groups:**

- Groups impacted through CDQ pollock in addition to additional investments in AFA
- Additional discussion in the analysis highlights the potential for impacts to CDQ groups' leverage in negotiating harvesting agreements and lease rates with CP harvesting partners and potential challenges with fishing CDQ pollock on an inshore vessel in the future

## **Spillover impacts from displaced effort:**

- Additional context added (Appendix 6) in order to consider any opportunity for increase revenue outside AFA, and any opportunity for negative impacts for increased pressure in other fisheries
- Very limited spillover possibilities, which are vessel-dependent

## **Seafood Market Challenges:**

- Current conditions of record-low seafood prices, inflation, increased foreign competition, among other factors could make the pollock fishery and associated processors more vulnerable to impacts



# Impacts to the Pollock Fisheries - Broader Implications of a B season Closure to Communities

**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

Magnitude of potential adverse effects depends on a community's connections to the fishery and amount of pollock left unharvested

- Reduced tax revenue for Alaska communities
  - Broader effects to the Aleutians East Borough and State
- Potential job losses or reduced wages for ~2,300 onboard crew and 1,700 processing crew
- CDQ groups could be challenged to support community programs in the same way



# Impacts to the Pollock Fisheries and Associated Communities, Alternative 3

**Potential impacts very similar in concept to those described under Alternative 2**

## **Primary differences:**

### **1) Impacts may not be experienced every year**

- Option 1: impacts in 3 or 6 years for 2011-2023,
- Option 2: impacts in 3 or 5 years for 2011-2023.

### **2) Under Option 1, a chum salmon PSC limit could be reduced to 75,000 with 2 or 3 areas' abundance thresholds are unmet, *and* if the limit was initially set at 100,000 chum salmon**

- Additional Table 4-23 (page 251) to show potential impacts of a limit of 75,000 chum salmon.
- This level could have been in place in 2021, 2022, and 2023, depending on initial PSC limit.
- A lower limit could close the fishery earlier and result in greater economic impacts.



# Impacts to the Pollock Fisheries and Associated Communities - Alternative 4

Minimal to no additional costs as a result of Alternative 4, relative to status quo.

- Many of the provisions described have already been adopted by the sectors through recently amended IPAs.
- Additional avoidance costs may have incurred as a result of their initial adoption.
- This alternative essentially codifies recent operational changes under the RHS program and other provisions in the IPAs.





# Impacts to the Pollock Fisheries and Associated Communities - Alternative 5

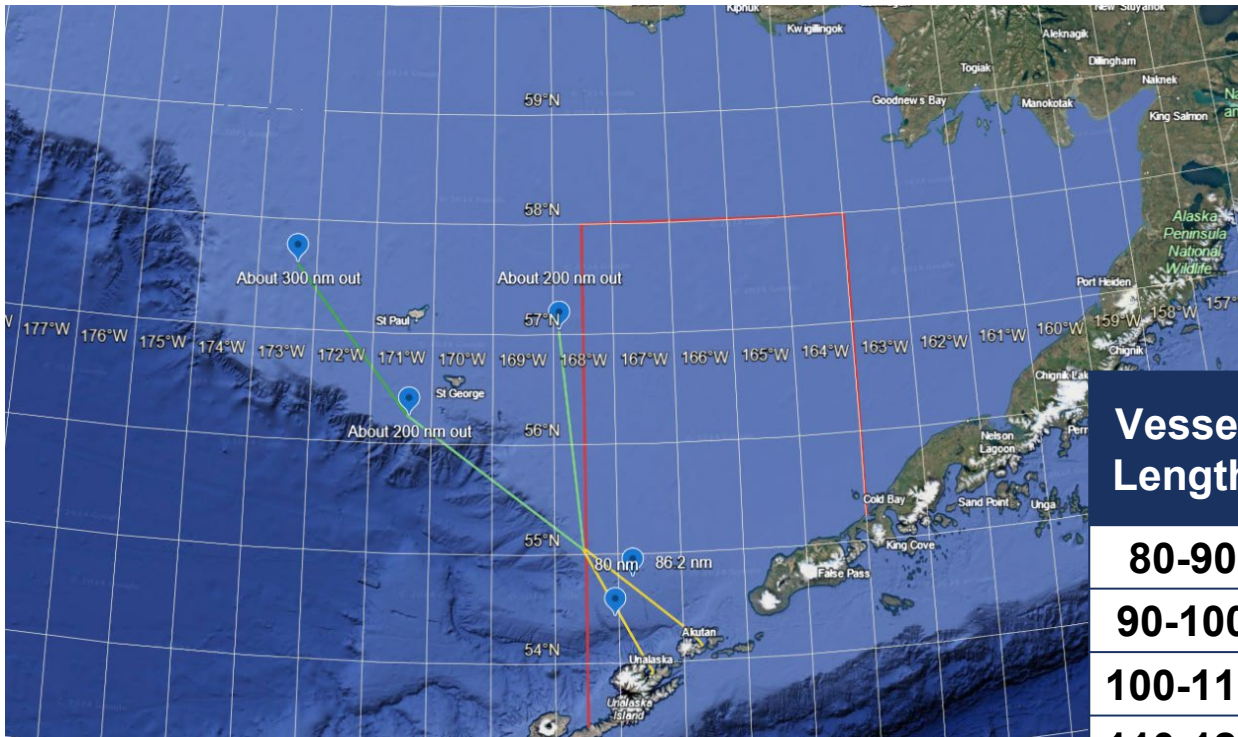
Sector	Corridor Closure	PSC limit	Apportionment	Number of years -	
				Fished in this area	Closure triggered
CDQ	Cluster 1	200,000	Least adverse: 3-yr avg	10	2
		50,000	Most adverse: AFA	10	4
	Unimak	200,000	Least adverse: 3-yr avg	9	1
		50,000	Most adverse: AFA	9	2
	Cluster 2	100,000	Least adverse: AFA	12	1
		50,000	Most adverse: 3-yr avg	12	4
CP	Cluster 1	200,000	Least adverse: AFA	12	0
		50,000	Most adverse: 3-yr avg	12	6
	Unimak	200,000	Least adverse: AFA	0	0
		50,000	Most adverse: 3-yr avg	0	0
	Cluster 2	100,000	Least adverse: AFA	13	3
		50,000	Most adverse: 3-yr avg	13	6

Sector	Corridor Closure	PSC limit	Apportionment	Number of years -	
				Fished in this area	Closure triggered
Inshore	Cluster 1	200,000	Least adverse: 5-yr avg	13	0
		50,000	Most adverse: AFA	13	11
	Unimak	200,000	Least adverse: 5-yr avg	13	0
		50,000	Most adverse: AFA	13	11
	Cluster 2	100,000	Least adverse: 3-yr avg	13	1
		50,000	Most adverse: AFA	13	5
Mothership	Cluster 1	200,000	Least adverse: 3-yr avg	13	2
		50,000	Most adverse: 5-yr avg	13	6
	Unimak	200,000	Least adverse: AFA	13	0
		50,000	Most adverse: 5-yr avg	13	7
	Cluster 2	100,000	Least adverse: 3-yr avg	13	1
		50,000	Most adverse: 5-yr avg	13	2



# Impacts to the Pollock Fisheries - Alternative 5

Smaller inshore CVs with less capacity may be more impacted by a Cluster 1 or Unimak closure



Vessel Length	2023 Vessels	Min. Maximum Distance by Vessel	Max. Maximum Distance by Vessel
80-90	4	159	255
90-100	13	136	279
100-110	3	197	503
110-120	7	197	512
>120	42	267	537



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# Western and Interior Alaska Chum Salmon Users



# Impacts to Western and Interior Alaska Chum Salmon Users, Alternative 1

Section 4.4 provides current subsistence and commercial harvest information

- Section 4.3.3.2 describes the importance of chum salmon for Indigenous Peoples in the Yukon and Kuskokwim Regions

Additional information on stock status in 3.2.3.1

- Beginning in 2020, WAK chum salmon runs declined dramatically
  - Management priority for conservation, then subsistence uses, and next all other consumptive uses
    - Yukon, Kuskokwim and other areas have faced total closures and/or very limited fishing opportunities
    - **Chum salmon are critically important for:** cultural identity, food security, food sovereignty, and the holistic health and wellbeing of ecosystems and communities

**Selection of Alternative 1 would retain existing chum salmon bycatch regulations. Existing conditions – chum salmon abundance or pollock fishing behavior – could change in the future, but the choice of Alternative 1 would not inherently create these changes**



Stock	Restrictions Imposed on harvests 2020 to 2023?		
	Subsistence	Commercial	Sport
<b>Nushagak</b>	No (all years)	No (all years)	No (all years)
<b>Kuskokwim Bay</b>	No (all years)	Yes (all years)	No (except 2023)
<b>Kuskokwim River</b>	Yes, limited (except 2020)	Limited (2020, 2021) No (2022, 2023)	Yes (except 2020)
<b>Yukon River Summer Run</b>	Limited (2020, 2023); yes (2021, 2022)	Limited (2020); yes (2021, 2022, 2023)	Limited 2020, 2023; no fishery 2021, 2022
<b>Yukon River Fall Run</b>	Limited (2020); yes (2021, 2022, 2023)	Yes (all years)	Yes (all years)
<b>Norton Sound</b>	No (all years)	Limited (all years)	No in 2020, 2021, 2022 Limited in 2023
<b>Kotzebue</b>	No (all years)	Limited (all years)	No (all years)



\* impacts discussed more by KRITFC and TCC

# Impacts to Western and Interior Alaska Chum Salmon Users, Action Alternatives

## **Two-part approach:**

- 1) Analysis on the magnitude and likelihood of WAK chum salmon savings under each alternative, and
- 2) Qualitative discussion of the broader benefits that could be realized under any action alternative that provided increased WAK chum salmon returns

## **Different nuances and types of uncertainty in potential impacts, similar approach to the cost analysis:**

- Similar use of retrospective data- an extension of the WAK chum salmon impact analysis
- Consideration of future impacts relative to retrospective data and AEQ estimates are different (not an upper or lower bound of potential savings)
- Different type and resolution of data to describe nuanced impacts of the proposed alternatives
- Similar emphasize on also considering broader implications from alternatives



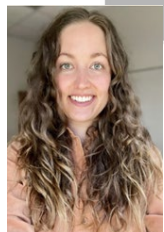


# Challenge to Determining Potential Benefits, Alternatives 2 and 3

Section 4.4.2.1

Table 3-21 Estimates on AEQ CWAK chum salmon savings

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Average
100,000, 3-year avg.	8,564	3,946	5,962	14,651	14,501	30,571	47,862	36,365	33,606	16,440	21,226	24,877	21,548
100,000, 5-year avg.	9,854	4,540	7,895	15,626	14,211	29,274	46,722	35,986	33,544	16,429	21,150	24,816	21,671
100,000, pro rata	9,854	4,540	7,895	15,626	14,239	29,296	47,214	36,276	33,059	16,115	21,158	24,866	21,678
100,000, AFA	9,870	4,548	9,547	14,917	12,823	30,389	42,069	31,555	32,434	16,234	21,591	29,978	21,330
325,000, 3-year avg.						7,192	19,595	12,221	5,846	2,000	5,594	4,604	8,150
325,000, 5-year avg.						6,420	19,151	10,911	4,993	2,193	5,842	4,520	7,719
325,000, pro rata						6,420	19,151	10,911	4,993	2,193	5,842	4,520	7,719
325,000, AFA					1,461	2,668	12,232	6,724	3,074	2,199	6,670	4,848	4,985
550,000, 3-year avg.						439	11,109	6,510	1,296	69	240	214	2,840
550,000, 5-year avg.							7,223	4,306	861	46	710	634	2,297
550,000, pro rata							7,223	4,306	861	46	717	641	2,299
550,000, AFA							1,398	833	166	9	515	460	564

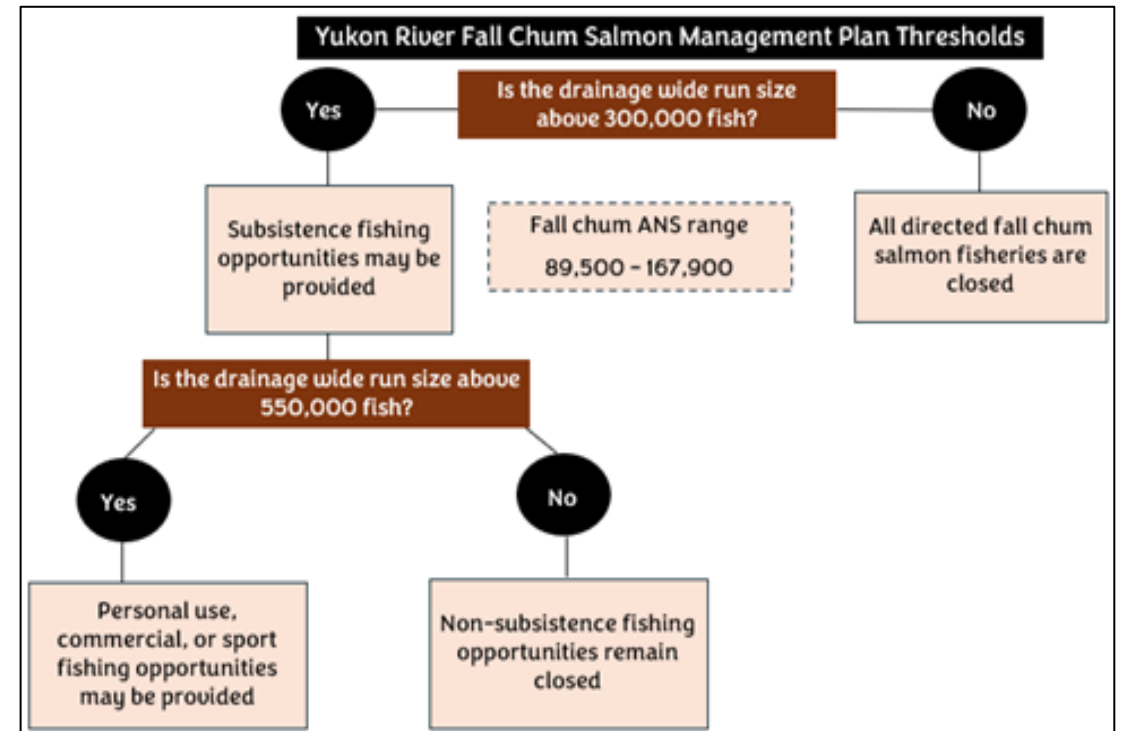
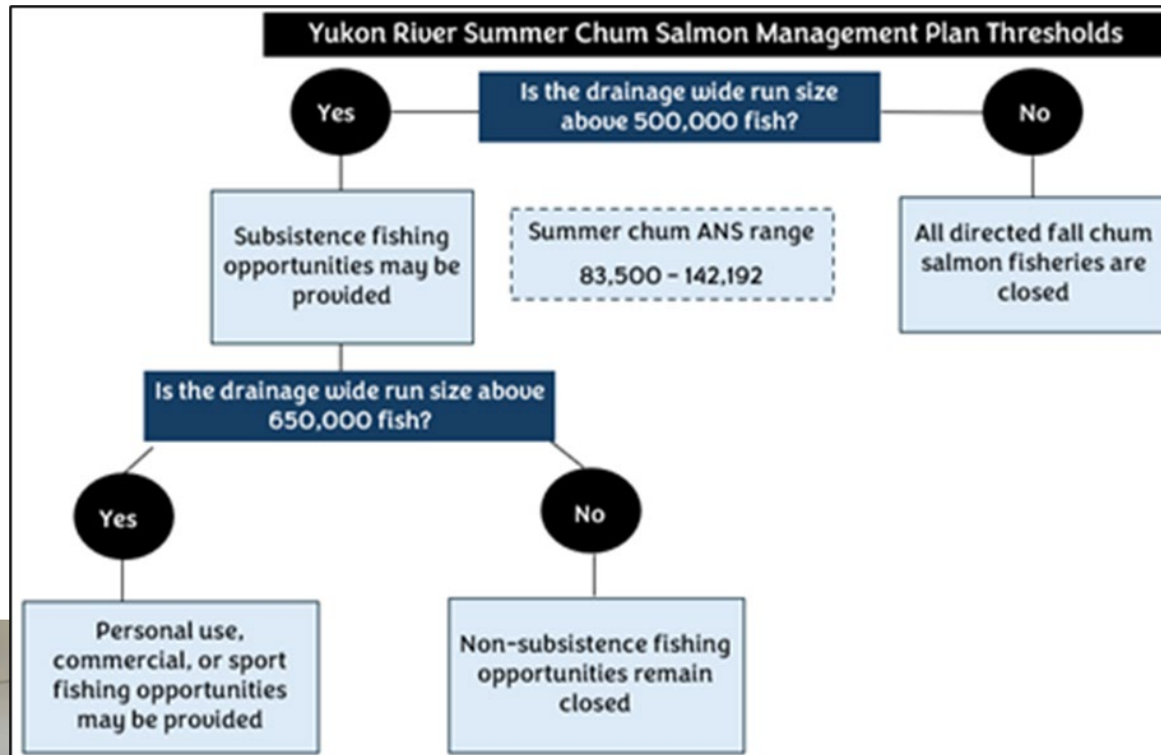


The proportion of AEQ CWAK chum salmon savings returning to these populations is unknown



# Quantitative Estimates on Potential Benefits, Alternatives 2 and 3 Section 4.4.2.1

- Yukon summer chum run reconstruction is available, and it provides thorough estimate of escapement + harvests (*i.e., total run size*)
- Management plans for Yukon summer and fall chum salmon have specific management thresholds





# Scaling AEQ CWAK Savings Estimates, Alternatives 2 and 3

Section 4.4.2.1

**Table 4-38 AEQ CWAK savings under a 100,000-chum salmon cap , pg. 306**

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
<b>Sector Apportionment 1, 3-yr avg.</b>												
Est. AEQ savings	8,564	3,946	5,962	14,651	14,501	30,571	47,862	36,365	33,606	16,440	21,226	24,877
Adj. to 75%	6,423	2,960	4,472	10,988	10,876	22,928	35,897	27,274	25,205	12,330	15,920	18,658
Adj. to 50%	4,282	1,973	2,981	7,326	7,251	15,286	23,931	18,183	16,803	8,220	10,613	12,439
Adj. to 25%	2,141	987	1,491	3,663	3,625	7,643	11,966	9,091	8,402	4,110	5,307	6,219
<b>Sector Apportionment 1, 5-yr avg.</b>												
Est. AEQ savings	9,854	4,540	7,895	15,626	14,211	29,274	46,722	35,986	33,544	16,429	21,150	24,816
Adj. to 75%	7,391	3,405	5,921	11,720	10,658	21,956	35,042	26,990	25,158	12,322	15,863	18,612
Adj. to 50%	4,927	2,270	3,948	7,813	7,106	14,637	23,361	17,993	16,772	8,215	10,575	12,408
Adj. to 25%	2,464	1,135	1,974	3,907	3,553	7,319	11,681	8,997	8,386	4,107	5,288	6,204
<b>Sector Apportionment 1, pro rata</b>												
Est. AEQ savings	9,854	4,540	7,895	15,626	14,239	29,296	47,214	36,276	33,059	16,115	21,158	24,866
Adj. to 75%	7,391	3,405	5,921	11,720	10,679	21,972	35,411	27,207	24,794	12,086	15,869	18,650
Adj. to 50%	4,927	2,270	3,948	7,813	7,120	14,648	23,607	18,138	16,530	8,058	10,579	12,433
Adj. to 25%	2,464	1,135	1,974	3,907	3,560	7,324	11,804	9,069	8,265	4,029	5,290	6,217
<b>Sector Apportionment 1, AFA</b>												
Est. AEQ savings	9,870	4,548	9,547	14,917	12,823	30,389	42,069	31,555	32,434	16,234	21,591	29,978
Adj. to 75%	7,403	3,411	7,160	11,188	9,617	22,792	31,552	23,666	24,326	12,176	16,193	22,484
Adj. to 50%	4,935	2,274	4,774	7,459	6,412	15,195	21,035	15,778	16,217	8,117	10,796	14,989
Adj. to 25%	2,468	1,137	2,387	3,729	3,206	7,597	10,517	7,889	8,109	4,059	5,398	7,495
Run size	2,406,000	2,479,900	3,349,600	2,467,600	1,978,400	2,581,500	3,635,100	2,074,700	1,689,400	763,200	156,130	478,690
Subsistence?	Limited	Limited	Limited	Limited	Limited	Limited	Limited	Limited	Limited	Limited	No	No
ANS met?	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No	No
Commercial?	Limited	Limited	Limited	Limited	Limited	Limited	Limited	Limited	Limited	Limited	No	No



# Potential Benefits, Alternatives 2 and 3

2017	100,000 cap	3-year avg	5-year avg	pro rata	AFA	In-river markers	
	Est. CWAK AEQ savings	47,862	46,722	47,214	42,069	Run size	3,635,100
Adj. to 75%	35,897	35,042	35,411	31,552	Subsistence?	Limited	
Adj. to 50%	23,931	23,361	23,607	21,035	ANS met?	No	
Adj. to 25%	11,966	11,681	11,804	10,517	Commercial?	Limited	

2021	100,000 cap	3-year avg	5-year avg	pro rata	AFA	In-river markers	
	Est. CWAK AEQ savings	21,226	21,150	21,158	21,591	Run size	156,130
Adj. to 75%	15,920	15,863	15,869	16,193	Subsistence?	No	
Adj. to 50%	10,613	10,575	10,579	10,796	ANS met?	No	
Adj. to 25%	5,307	5,288	5,290	5,398	Commercial?	No	

- Summer and fall chum runs well above drainagewide escapement goals in 2017 and well below in 2021
- Alternatives and options may not change outcomes for directed fisheries but result in more fish in the river system, improving abundance
- Estimates may not fully capture the importance of a relatively small number of returning fish due to reduced bycatch to ecosystem and community wellbeing

Adjusted Table 4-38 and 4-39 to show years with highest and lowest run size

2017	100,000 cap	Est. Up/Mid Yukon Savings		In-river markers	
	3-year avg		11,553		Run size
5-year avg		11,308		Subsistence?	Limited
pro rata		11,441		ANS met?	No
AFA		9,969		Commercial?	Yes

2021	100,000 cap	Est. Up/Mid Yukon Savings		In-river markers	
	3-year avg		3,207		Run size
5-year avg		3,195		Subsistence?	No
pro rata		3,203		ANS met?	No
AFA		3,255		Commercial?	No



# Impacts to Western and Interior Alaska Chum Salmon Users, Alternative 3

## Primary differences in Alternative 3 from Alternative 2:

- 1) Savings and associated beneficial impacts may not occur in every year.
  - Option 1: impacts in 3 or 6 years for 2011-2023,
  - Option 2: impacts in 3 or 5 years for 2011-2023.
- 2) Under Option 1, a chum salmon PSC limit could be reduced to 75,000 with more thresholds unmet, if the limit was initially set at 100,000 chum salmon
  - Additional Tables 4-40 and 4-41 (page 251) to show potential WAK chum salmon AEQ savings impacts of a limit of 75,000 chum salmon.
  - This level could have been in place in 2021, 2022, and 2023, depending on option.
  - A lower limit could close the fishery earlier and result in greater WAK chum salmon savings.



# Impacts to Western and Interior Alaska Chum Salmon Users, Alternative 4

## Relative to status quo, most Alternative 4 provisions have the potential to reduce chum salmon bycatch

- Although analysts cannot disaggregate impacts of specific measures relative to external factors, new measures adopted voluntarily and through amendments to IPAs since 2021 have coincided with an ~ 95% reduction in chum salmon bycatch.
- This alternative essentially codifies recent operational changes under the RHS program and other provisions in the IPAs.
- Many of the additional measures (described in Section 3.2.4.3) would increase the likelihood of WAK chum salmon savings. Thus, may provide benefits for WAK chum salmon users.

Year	Chum Salmon Bycatch in the B season	WAK Chum Salmon Bycatch in the B season
2021	545,901	51,512
2022	242,309	55,724
2023	111,843	11,491
2024	35,125	4,205 (preliminary)



# Impacts to Western and Interior Alaska Chum Salmon Users, Alternative 5

## Alternative 5 could have varied outcomes for those dependent on WAK chum salmon

- Analysis is an extension of the impacts analysis for WAK chum salmon.
- Highlights the **likelihood for positive outcomes** and **risk of potential adverse effects** (i.e., more WAK chum salmon caught)
- Depends on the corridor, cap amount and apportionment selected, as well as the pollock fleet's response

**Cluster 1 and Unimak:** possible high benefits, but also high risk for adverse effects

**Cluster 2:** possible low/medium benefits, but lower risk of adverse effects

- Also considered the potential impacts to Chinook salmon PSC

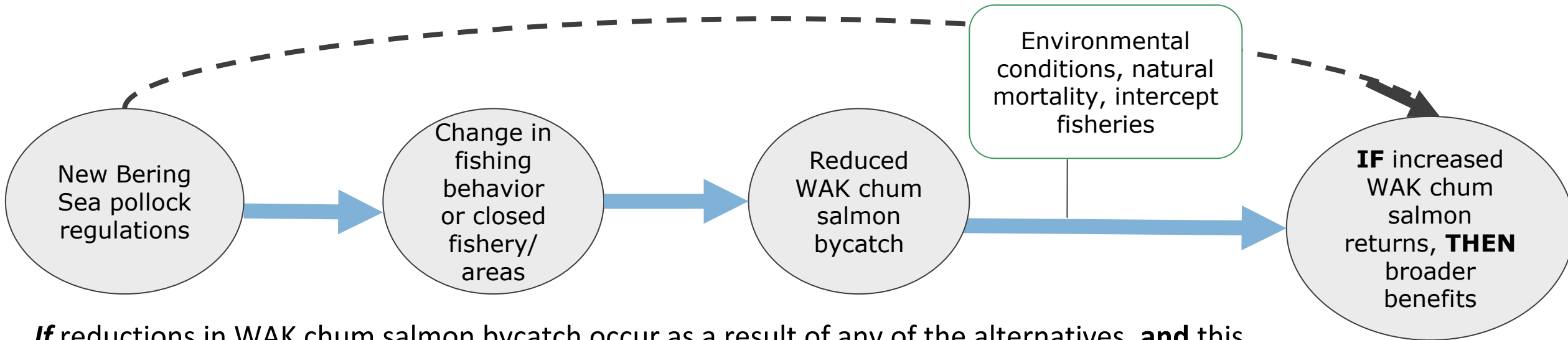
If corridor caps result in longer seasons due to increased chum salmon avoidance techniques or increased travel, may increase Chinook bycatch

- **If WAK chum salmon savings are realized, there could be broad implications and benefits**



# Impacts to Western and Interior Alaska Chum Salmon Users, Broader Implications of Salmon Savings

Impacts of reduced WAK chum salmon bycatch would be experienced cumulatively with other factors that influence WAK chum salmon returns. These intervening variables **add another layer of uncertainty** to the possible future impacts of the proposed actions.



**If** reductions in WAK chum salmon bycatch occur as a result of any of the alternatives, **and** this increases the number of WAK chum salmon returning to their rivers of origin, **there could be widespread social, cultural, economic, and broader ecosystem benefits.**



# Impacts to Western and Interior Alaska Chum Salmon Users, Broader Implications of Salmon Savings

## **Ecosystem and passive use benefits**

Could be realized with any amount of additional chum salmon returns

## **Additional subsistence or commercial fishing opportunities**

Based on meeting escapement goals and dynamic in season management

**If bycatch reduction efforts contribute to longer-term viability of the stock, this could support a widely positive effect on human-salmon-ecosystem relationship**

Community benefits

Indigenous values and culture

Knowledge transfer

Mixed economies

Cumulative impacts throughout inriver ecosystem

Food security and food sovereignty

Mental, physical and emotional health







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# Combined Effects of the Alternatives and Tradeoffs



# Incentive Structure Under a Combination of Alternatives

No action

**Alt 1**

Chum PSC limit

**Alt 2**

Chum PSC limit, triggered by abundance

**Alt 3**

IPA measures

**Alt 4**

Corridor cap

**Alt 5**

Regulatory and non-regulatory status quo incentives (e.g., IPA requirements, responding to outside pressure, CDQ associations, etc.)

If Alt 2 or 3 are adopted with Alt 4, in addition to status quo incentives:

- The tools under Alt 4 could be used to compliment objective of Alt 2 or 3 of reducing chum bycatch (e.g., the use of bi-weekly closures could be more reactive to chum on the grounds).

If Alt 4 is adopted with Alt 5, in addition to status quo incentives:

- The tools under Alt 4 may be used to respond to the restrictions under Alt 5

If Alt 2 or 3 are adopted with Alt 4 and 5, in addition to status quo incentives:

- More complex inseason decision making
- Incentives to minimize all chum salmon (not inherently WAK chum salmon) in corridor and outside
- The measure with greatest consequences and likelihood of occurring are most likely to drive behavior (this could be different by sector and the time of the season)

Modified from  
Figure 5-1,  
page 319



# Potential for Chum Salmon Bycatch Reductions Under a Combination of Alternatives

Chapter 5

## Alternatives 2 or 3 + 5

- Reduce chum salmon bycatch compared to status quo
- May decrease some of the uncertainty of potential adverse impacts of Alternative 5 on chum salmon
- Layering on a hard cap would limit the amount of total chum that could be caught in a year, including outside a corridor
  - *E.g.*, Cluster 1 corridor + overall hard cap

## Alternatives 2 or 3 + 4 *and/or* 5

- Similar considerations to Alternative 2 or 3 + 5
- IPA measures in response to Alternative 4 provisions could be used as tools to reduce bycatch under the other alternatives
  - *E.g.*, bi-weekly evaluation of RHS closures
  - *E.g.*, closing stat areas with very high bycatch rates



## Alternatives 2 or 3 + 5

- Greater cost to industry than stand alone alternatives **if** the corridor closure presents high consequences for the sector
  - If not, similar impacts to an overall PSC limit
  - If so, more avoidance techniques and more complex decision-making which could lead to increased PSC trade-offs

## Alternatives 2 or 3 + 4 *and/or* 5

- Generally, these avoidance techniques may aid the industry attempts to remain under overall PSC limits or corridor-specific caps
- Adding on Alternative 4 unlikely to increase costs relative to the standalone alternative

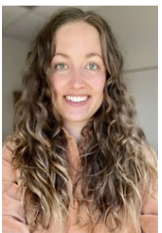
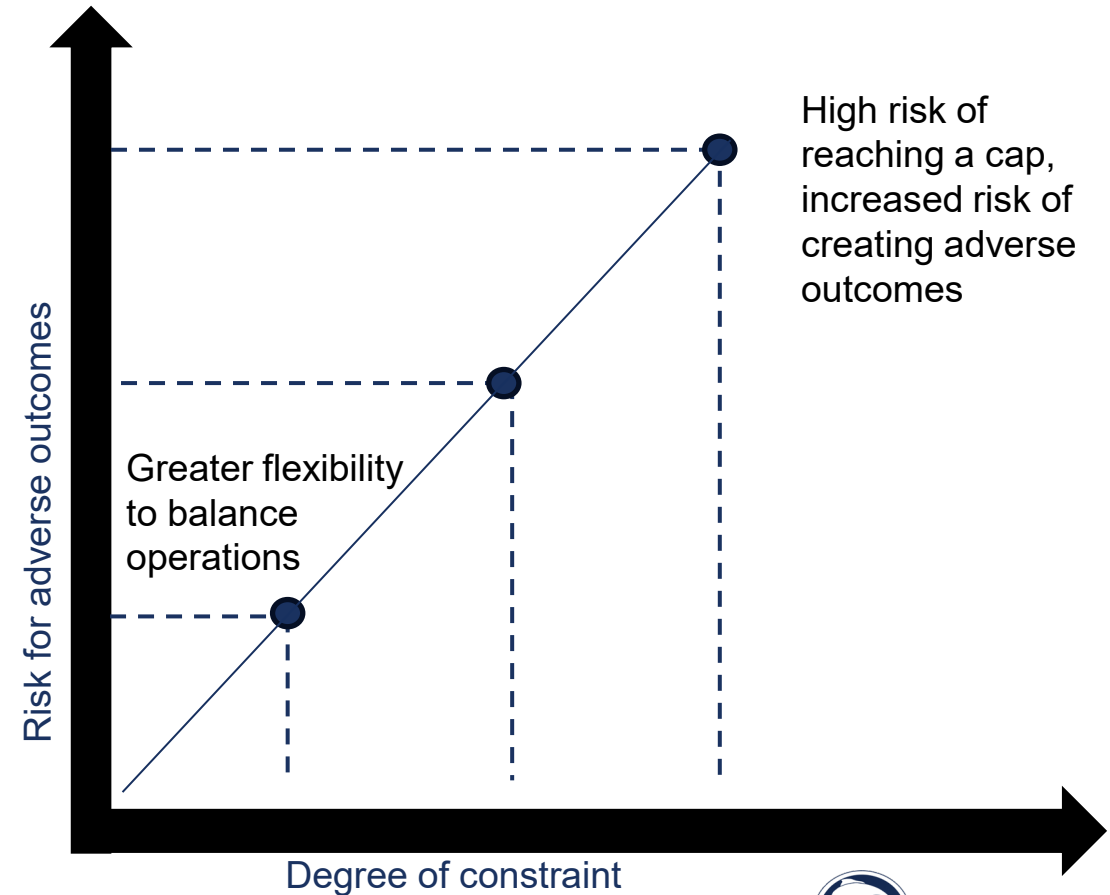


# Summary of PSC and Policy Tradeoffs

Section 3.5

**Alternatives 2, 3, and 5 would require the pollock industry to balance its operations against multiple constraining PSC limits**

- Timing of chum and WAK chum PSC encounters are dissimilar from Chinook
  - Behavior changes that divert pollock catch later into the B season could have adverse impacts on Chinook PSC
- Move to new areas with potentially unknown PSC encounters or rates





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# Management, Monitoring and Enforcement



# Monitoring: NMFS counts all salmon bycatch

Fishery	Observer monitoring	Salmon discard prohibition	Salmon accounting	Salmon biologicals
Catcher Processor	✓ At-sea observers (200%)	✓ All salmon discards are prohibited	✓ All salmon are counted and identified to species	✓ Biological information, including genetic samples, on Chinook and chum salmon
Motherships	✓ At-sea observers (200%)			
Catcher vessels (shoreside) <u>without</u> electronic monitoring	✓ At-sea and shoreside observers (100%)			
Catcher vessels (shoreside) <u>with</u> electronic monitoring	✓ At-sea video recording of all fishing activity and shoreside observers monitoring			





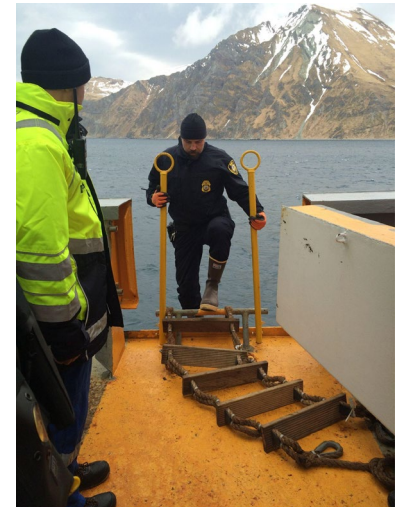
# Management

Task	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Apportioning PSC limits	[for Chinook] -Sector -CDQ groups, cooperatives, open access fishery	Same	Same	n/a	Same
Monitoring PSC limits	[for Chinook] -At vessel level ->coop mgrs monitors -At cooperative level -> NMFS monitors -At sector level -> NMFS monitors -Open access -> NMFS monitors and manages	Same	Same	n/a	Same
Approving IPAs	-NMFS must review and approve all IPAs. -May only disapprove for reasons under 50 CFR 679.21(f)(12)(v)(D). -IPAs provide annual reports to Council.	n/a	n/a	Same	n/a
Applying PSC limits during low abundance	[for Chinook] -Review ADF&G letter -Apply appropriate PSC limit harvest specification process (starts in October)	n/a	Same	n/a	n/a
Approving PSC transfers	[for Chinook] -Intra-coop transfers facilitated by coop mgrs -Inter-coop, inter CDQ group, inter-sector transfers approved by NMFS -post-delivery transfers conditionally permitted -all transfers reported	Same	Same	n/a	Same



# Enforcement: NOAA Office of Law Enforcement

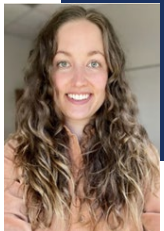
- Prohibited Species Catch limits (Alternatives, 2, 3, and 5)
  - NMFS monitors all Chinook PSC relative to the apportioned PSC for each sector, CDQ group, and cooperative.
  - If a sector, cooperative, or CDQ group exceeds its apportioned PSC, NMFS notifies the NOAA Office of Law Enforcement.
  - The Office of Law Enforcement uses data from observers, vessel monitoring systems and logbooks to identify potential fishing violations.
- Incentive Plan Agreements (Alternative 4)
  - After NMFS approval, cooperatives monitor and enforce all IPA provisions.





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# Final Points for Consideration



## **REMINDER** of Action Under C2

### At this meeting, the Council may decide:

1. Whether to modify the current range of action alternatives, and if so, how
  - Table 1-3 provides a comparison of each alternative
  - Table 1-10 provides points for consideration to further develop each alternative
2. Whether to request additional analytical review through an additional Council meeting
  - Tentative timeline is available in the action memo
3. Whether to recommend the analysis be released for publication by NMFS as the draft EIS
  - The Council can recommend publication whether the alternatives are modified or not



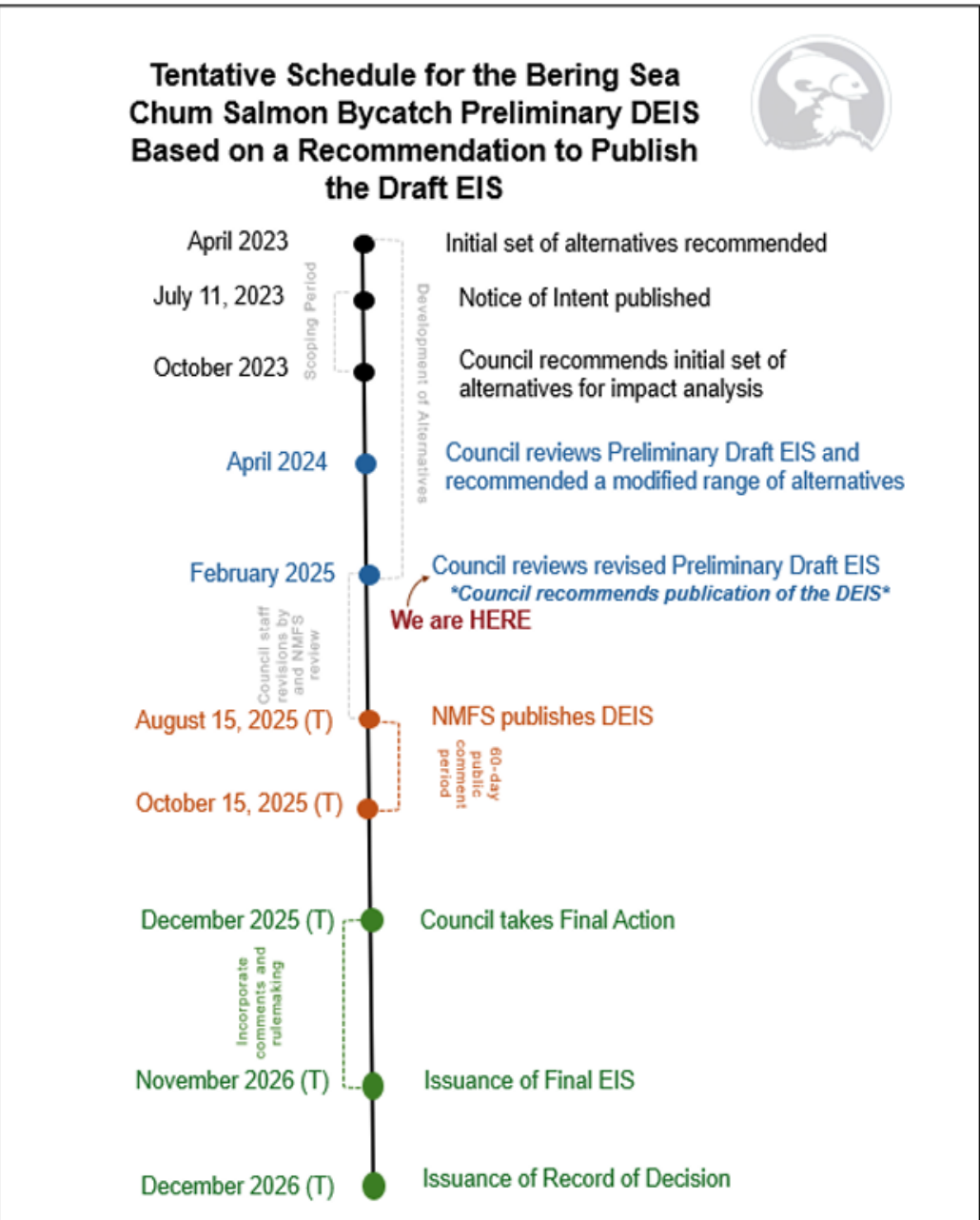


Figure 1. Tentative timeline for the Bering Sea chum salmon bycatch action if the Council recommends the DEIS be published at the February 2025 meeting.

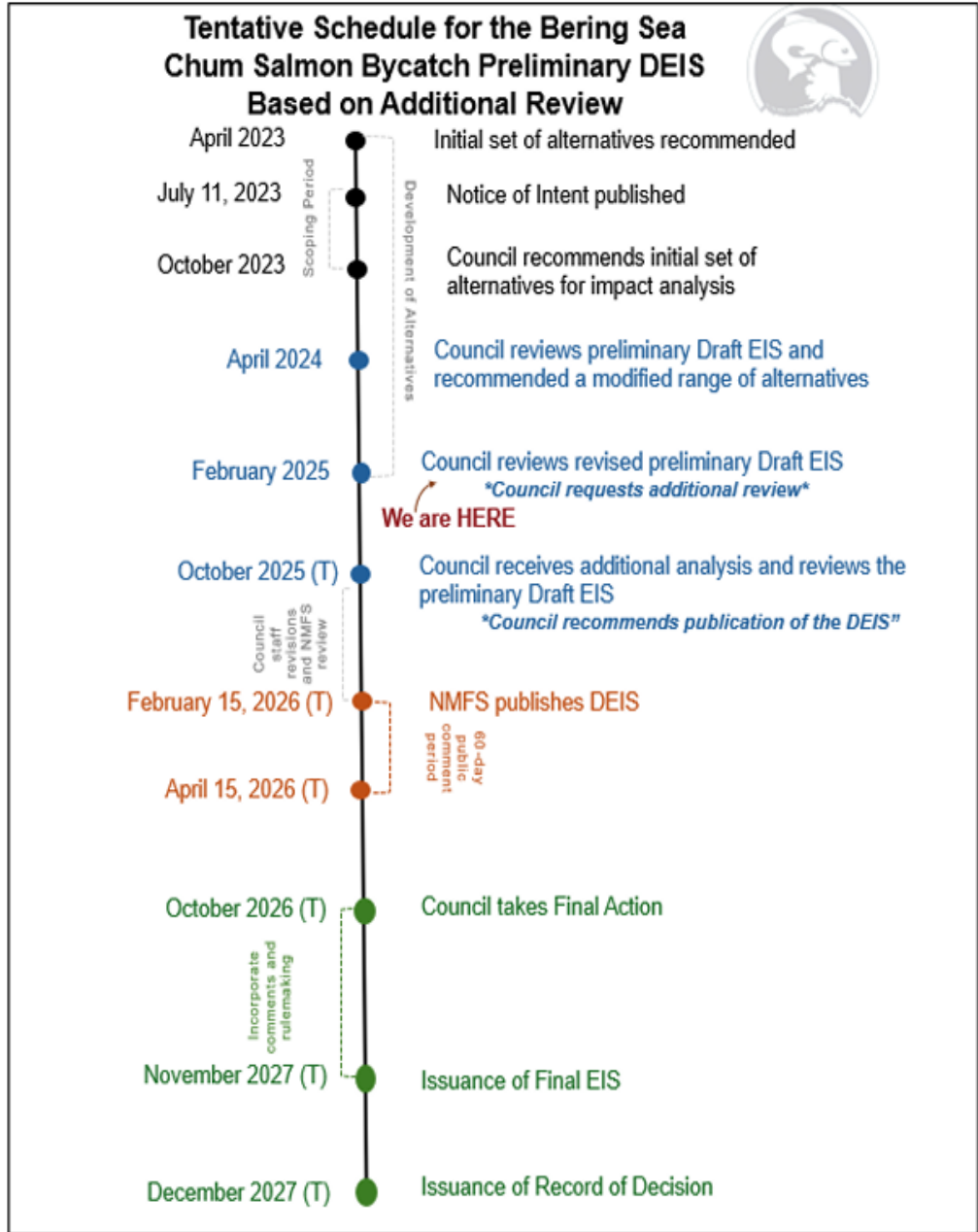


Figure 2. Tentative timeline for the Bering Sea chum salmon bycatch action if the Council requests additional review.

## **REMINDER** Remaining Components of the C2 Agenda Item

- ~~1. Staff presentation on preliminary Draft Environmental Impact Statement~~
2. Tribal Consultation and Engagement Report
3. Kuskokwim River Inter-Tribal Fish Commission
4. Tanana Chiefs Conference
5. 2024 Bering Sea chum salmon bycatch genetics report



Questions?

**THANK YOU!**  
Contributors and  
persons consulted,  
pg. 330-331

