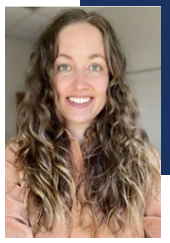
C2 Bering Sea Chum Salmon Bycatch

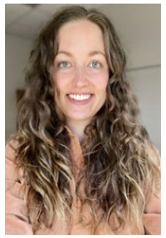
Presentation to the Advisory Panel, February 2025

Kate Haapala and Sarah Marrinan, Council Staff



Information Available for the C2 Agenda Item

- Preliminary Draft Environmental Impact Statement (preliminary DEIS)
  - Revised and synthesized from April 2024 preliminary DEIS and SIA
    - The National Marine Fisheries Service 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)
- Appendices to the preliminary DEIS
- Addendum
- Action memo and presentation
- Presentations from NMFS on Tribal Consultation and Engagement
- Presentations from KRITFC and TCC
- 2024 Bering Sea chum salmon genetics report and presentation

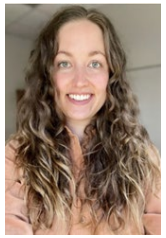


Purpose and Need for the Proposed Action

Section 1.1

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 with a focus on 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 (see Figure 1-2 and Section 3.2.3.1)

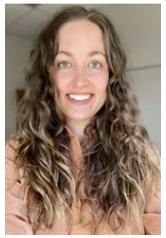


Bering Sea Pollock Fishery

- Encounters the majority of salmon bycatch in the BSAI
- 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%
Average	**272,179**	**268,776**	**98.5%**	**267,704**	**99.6%**

Table 3-8, pg. 85



Section 3.2.4.1.3

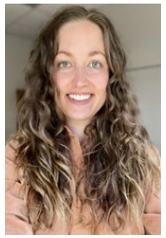
Chum Salmon Genetic Baseline

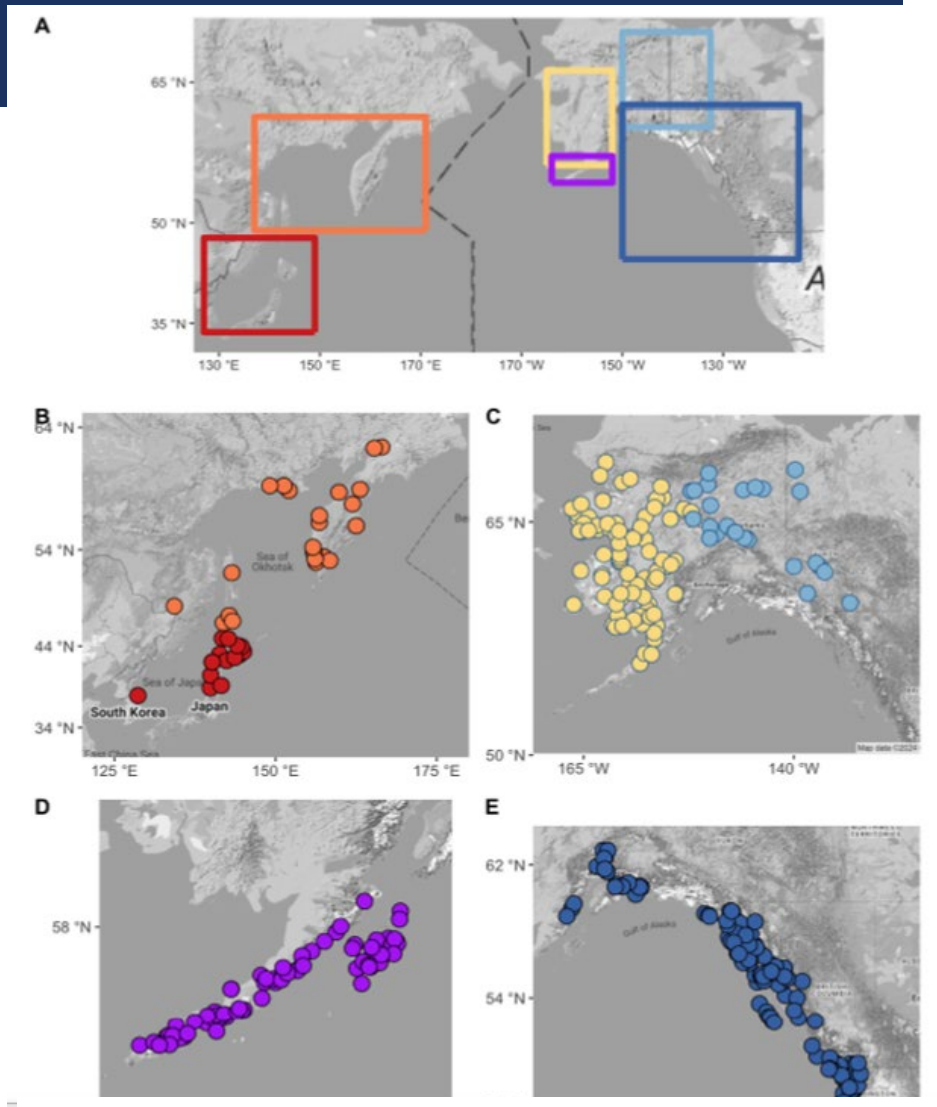
Chum salmon caught as bycatch originate from countries along the North Pacific Rim

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 in total bycatch varies each year, averaging 18.6% (2011–2023)

Snapshot of the 2023 B season:

- 111,843 chum salmon caught as bycatch
  - 10.6% (11,491 chum salmon) estimated to originate from WAK river systems

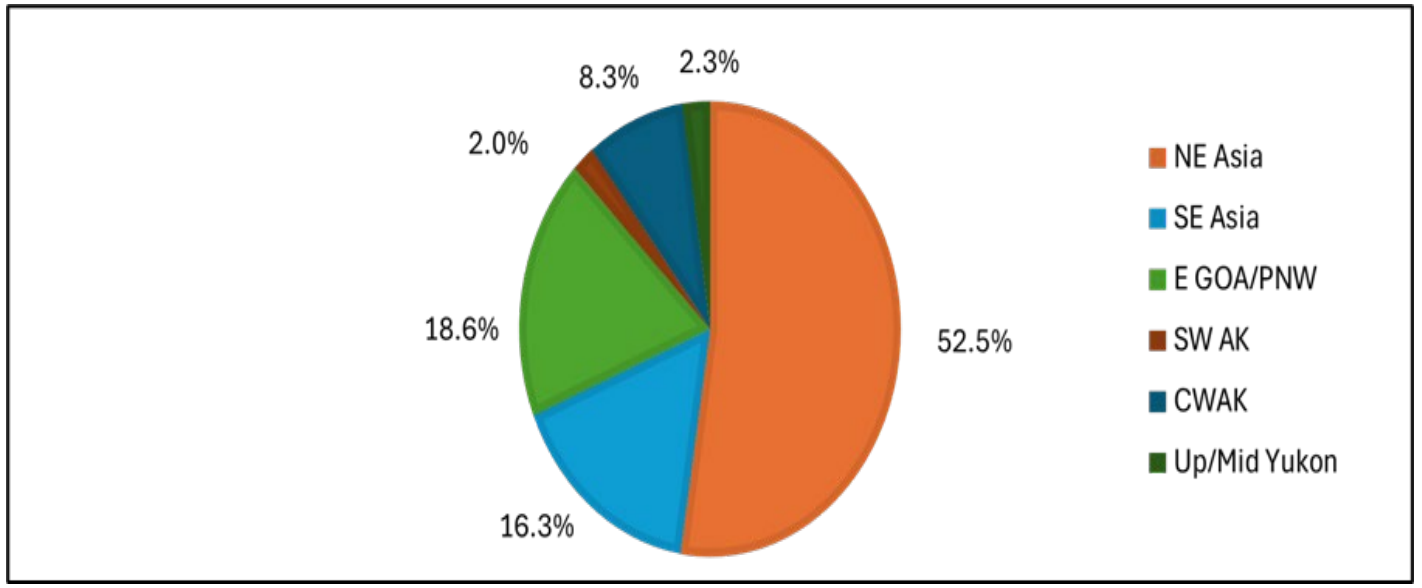
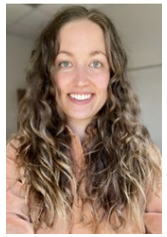


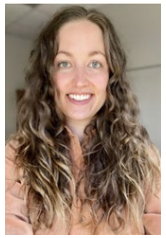
Figure 1-3 Genetic stock composition estimates for chum salmon bycatch in the 2023 B season pollock fishery



AP Action Under C2 - Provide Advice on the Following

At this meeting, the Council may decide:

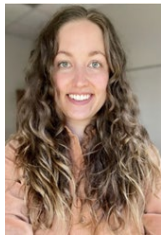
1. Whether it would like to modify the current range of action alternatives, and if so, how
   a. Table 1-3, comparison of management tools under each alternative
   b. Table 1-10, points for consideration to further develop the alternatives
2. Whether to request additional analytical review through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



Outline for the Remainder of the Presentation

1. ~~Purpose and Need~~
2. Alternatives
3. Environmental Assessment
4. Social and Economic Assessment
5. Combined Effects of the Alternatives
6. Management, Monitoring, and Enforcement

Focused on impacts and points directly related to decision-making



Dutch Harbor, ASMI Industry and Partner Use

Alternatives (Chapter 2)

Alternative 1, No Action

Section 2.2.1 and 2.2.2

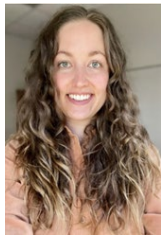
Retains existing regulations:

Rolling Hotspot System (RHS)

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

Chum Salmon Savings Area

- Fixed area closure in the southeastern Bering Sea
- Savings Area 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



Alternatives Under Consideration

Chapter 2

Alternative 1: No Action

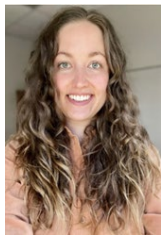
Alternative 2: Overall chum salmon PSC limit

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

- Alternatives 2–4 = “action alternatives”
- Regulatory changes would only be in effect during the B season pollock fishery from June 10 – November 1



Alternative 2, Overall Chum Salmon PSC Limit

Section 2.3

PSC limit or "hard cap" in place during each B season (June 10–November 1)

- Range: 100,000–550,000 chum salmon based on history (2011–2022)
- Four different options for dividing the hard cap among the pollock fishing sectors
  - 3-year average, 5-year average, pro rata, AFA allocation
  - Further divided among inshore cooperatives and CDQ groups

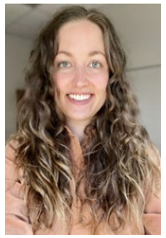
Alternative 2 is mutually exclusive to Alternative 3

Can be selected with Alternative 4 or 5

Table 2-2 Summary of apportionment percentages by option and 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%

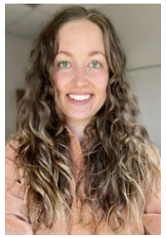
Notes: The AFA percentages under Option 4 reflect the CDQ program's pollock allocation and the AFA sectors' pollock allocation of the directed fishing allowance, the latter of which sets aside the ICA which is used for the incidental catch of pollock in other groundfish fisheries.



Alternative 3, PSC Limit with Abundance Indices

Section 2.4

- Alternative 3 includes overall chum salmon hard caps with abundance indices
  - Hard cap *may* be in place during the B season, if WAK chum salmon returns do not exceed their thresholds
- Two mutually exclusive options for indices being considered
  - Three-area index (Option 1) and the Yukon Area index (Option 2)
  - Cap range for Alternative 3, Option 1: 75,000 –550,000
  - Cap range for Alternative 3, Option 2: 100,000 –550,000 (*i.e.,* the same as Alt. 2)
  - Sector apportionments and transferability provisions are the same as Alt. 2



Alternative 3 is mutually exclusive to Alternative 2

Can be selected with Alternative 4 or 5

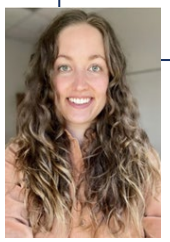
Alternative 3, Option 1 Three-Area Index

Section 2.4.1

Area	Available Data	Thresholds
Yukon	Run reconstructions for Yukon summer and fall chum salmon	1,713,300 or 2,718,400 summer + fall chum
Kuskokwim	Bethel test fishery cumulative CPUE	2,800 or 5,200 chum
Norton Sound	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

Thresholds are a Council decision point - only one would be selected for implementation



Reminder - indices are mutually exclusive

Alternative 3, Option 1 Step Down Provisions

Section 2.4.1

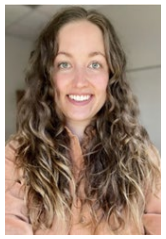
- If all three areas (3/3) have returns above thresholds, a hard cap **would not** be in place the next B season
- If only two areas (2/3) have returns above thresholds, a hard **would be** in place in the next B season
  - Hard cap would be an amount between 100,000 to 550,000 chum
- If only 1 or 0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



Reminder - indices are mutually exclusive

Alternative Data Sources for the Kuskokwim Area

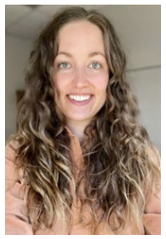
Appendix 2, pgs. 13-14 and Appendix 7, pg. 33

New decision point

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

Alternative Data Sources - Reference

Appendix 2, pgs. 13-14

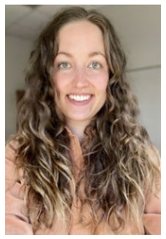
Alternative data source	Summary of advantages	Summary of disadvantages
Kuskokwim Sonar	Reliable funding; estimates abundance past Bethel; uses standard methods as the Yukon and Kenai Rivers; correlates well with LKTK; information is available to the public; and may be used to inform future run reconstruction 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.
Kogrukluk River Weir	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.
Other Weirs (Kwethluk, Salmon, George, and Takotna Rivers)	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.
Total Harvest (Commercial, Subsistence, Test Fisheries and Recreational)	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.
Drainagewide Run Reconstruction **Not Presently Available**	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

Section 2.5

Alternative 4 would modify existing regulations for the salmon bycatch IPAs

- Add six provisions for chum salmon avoidance → IPAs would be modified to incorporate responsive measures
  - IPA representatives submitted proposals February 2024 and Council modified Alternative 4 in April 2024
  - 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

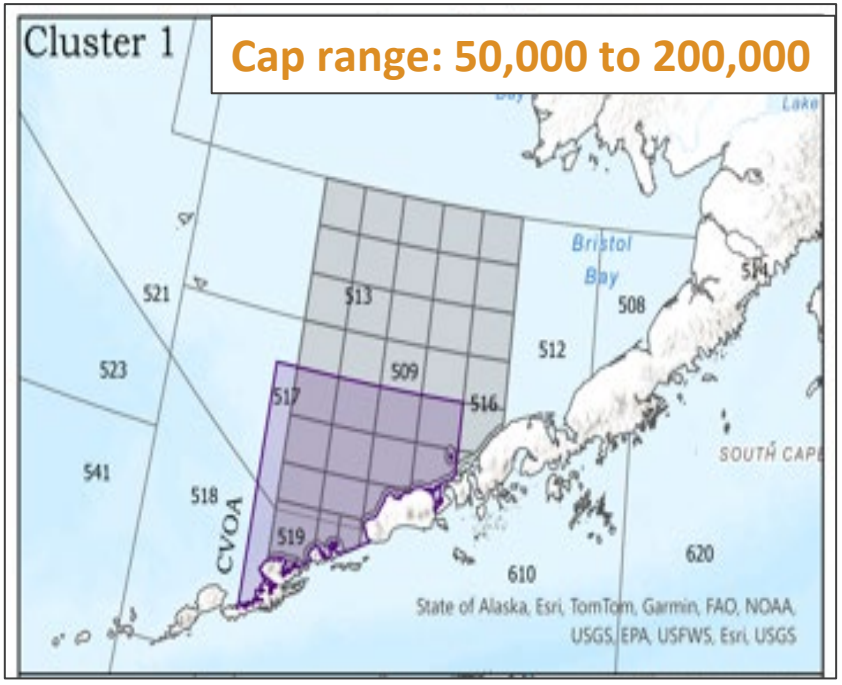
1. Require the pollock sectors to describe in their IPA how historical genetic stock composition data are included in chum salmon avoidance measures.
2. Require the pollock sectors to describe in their IPAs how they monitor for potential chum salmon avoidance closures more than once per week.
3. Require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

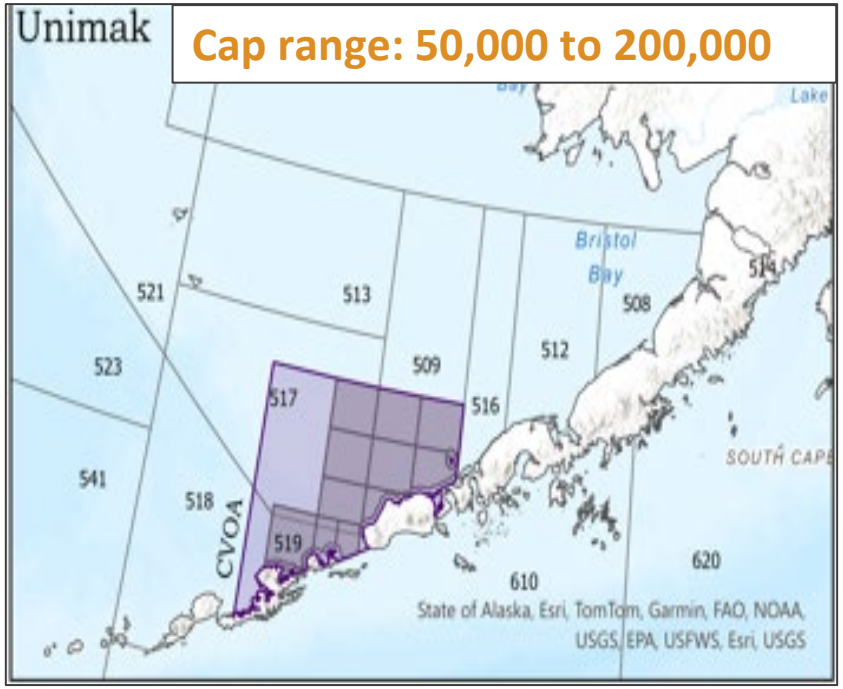
Alternative 5, Inseason Corridors

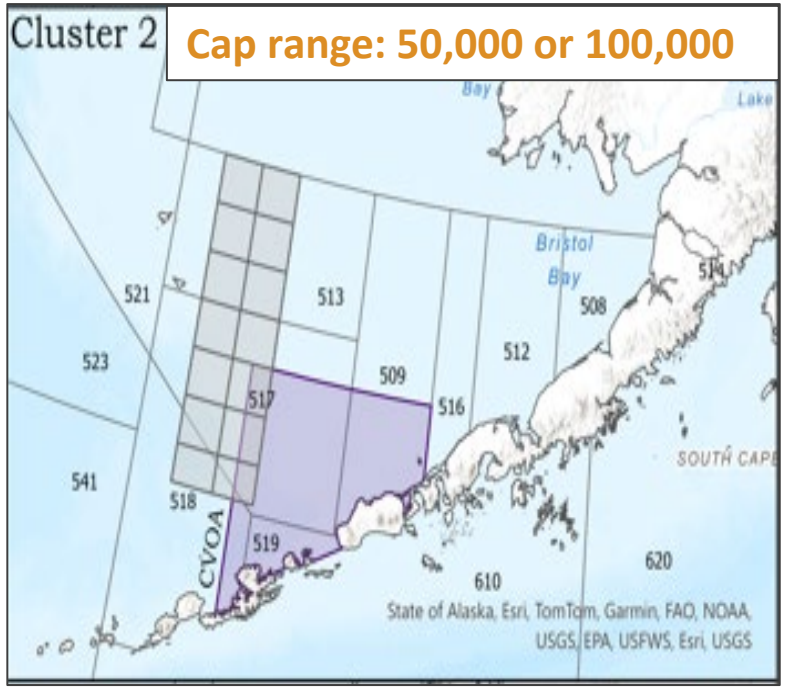
Section 2.6

- Three time/area closures 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 PSC limit
- If the PSC limit is met, NMFS would close the area until September 1, but vessels may continue fishing outside

Reminder - can be selected with Alternatives 2, 3, or 4







Alternative 5, Inseason Corridor Apportionments

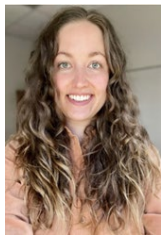
Section 2.6

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

Corridor	Apportionment	CDQ	CP	Mothership	Inshore
Cluster 1	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%
Unimak	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%
Cluster 2	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

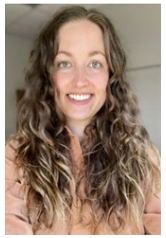



Dutch Harbor, ASMI Industry and Partner Use

Key Background Information for the Impact Analysis

Background on the Impact Analysis

- Responds to the National Environmental Policy Act (NEPA), Magnuson-Stevens Fishery Conservation and Management Act (MSA), among other laws, treaties, and policies (Section 1.4)
- A primary purpose of this analysis is to characterize the analytical baseline, *i.e.,* "status quo"
  - State of the world as it is today and what could continue if Alternative 1, No Action is recommended
  - The baseline is what all proposed action alternatives are compared against
- NEPA requires an analysis of the direct effects, indirect effects, and cumulative effects (pg. 15)



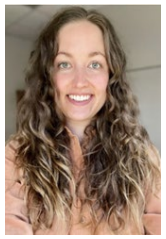
Retrospective Analysis - Alternatives 2 and 3 Section 3.2.4.2

Retrospective Analysis Provides:

- ✓ Estimates on potentially forgone pollock catch *and*
- ✓ Estimates on chum salmon bycatch reductions, based on the date a cap was met
- ✓ A way to compare the costs and benefits of the alternatives
- ✓ Anchor points - quantitative benchmark using fisheries-dependent data

Retrospective Analysis Does NOT Provide:

- × An account of likely and anticipated future behavior changes
- × Estimates on potential PSC reductions *above* the retrospective numbers
- × An account of how fishermen will weigh the risks and ability to modify behavior (*i.e.,* tradeoffs)
- × Possible operational changes are described further in Section 3.2.4.2.5



Incentive Structure Under the Alternatives

No action	Chum PSC limit	Chum PSC limit, triggered by abundance	IPA measures	Corridor cap
Alt 1	**Alt 2**	**Alt 3**	**Alt 4**	**Alt 5**

Regulatory and non-regulatory status quo incentives (e.g., IPA requirements, 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

Uncertainty and Context for Retrospective Analysis

Chum salmon	Retrospective estimates are **lower bound on chum salmon savings** in the future. Fishing behavior changes in response to these limits could further reduce chum salmon PSC.
WAK chum salmon	Given the behavior changes that could occur, and the inter-annual variation in the proportion of WAK chum in total bycatch, the retrospective estimates are **not a lower or upper bound on WAK chum salmon savings** in the future. WAK chum PSC could be higher or lower (or the same) as a result of this action.
Chinook and herring PSC	Retrospective estimates from potential closures are expected to be an **upper bound on Chinook and herring PSC savings** as a result of this action. Chinook salmon and herring PSC savings could be less or even negative as a result of the chum salmon avoidance incentives in this action prior to a closure/ if a closure does not occur. Beyond an early closure, the additional constraints from chum salmon PSC limit do not present any inherent benefits to Chinook or herring avoidance.
Pollock fishery	Retrospective estimates are an **upper bound of revenue impacts**. Behavior changes could delay or prevent a closure, resulting in lower revenue impacts. However, avoidance may result in operational costs and distributional impacts. Additionally, a B season closure may result in broader implications beyond revenue estimates, as described qualitatively.
WAK chum salmon users	Given the pollock fleet behavior changes that could occur, estimates are **not a lower or upper bound on WAK chum salmon saving** in the future. WAK chum PSC could be higher or lower (or the same) as a result of this action. This analysis also provides qualitative description of broader implications of additional subsistence/ commercial harvesting opportunity for communities, mixed economies, cultural identities, ecosystem, and Indigenous ways of life that would be considered under potential benefits.


Dutch Harbor, ASMI Industry and Partner Use

Environmental Assessment (Chapter 3)

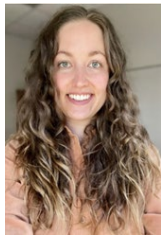
Resource Components Analyzed

Environmental Assessment (Chapter 3)

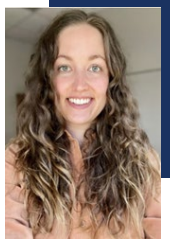
All resources categories analyzed for potential impacts of the proposed alternatives

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

Focus of presentation



Chum Salmon



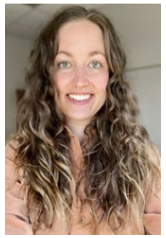
Total Chum Salmon Bycatch, Alternative 1

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

Year	CDQ	CP	Mothership	Inshore	Total
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
Average	**17,760**	**75,673**	**23,047**	**151,224**	**267,704**

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



Total Chum Salmon Bycatch, Alternative 1

Section 3.2.4.1.2

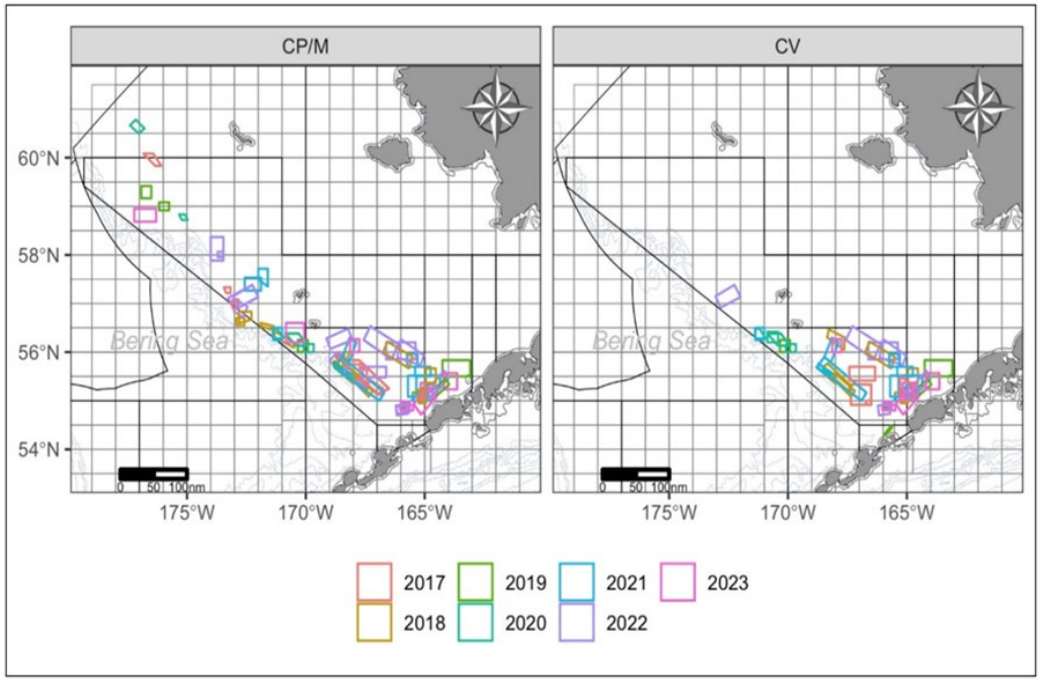
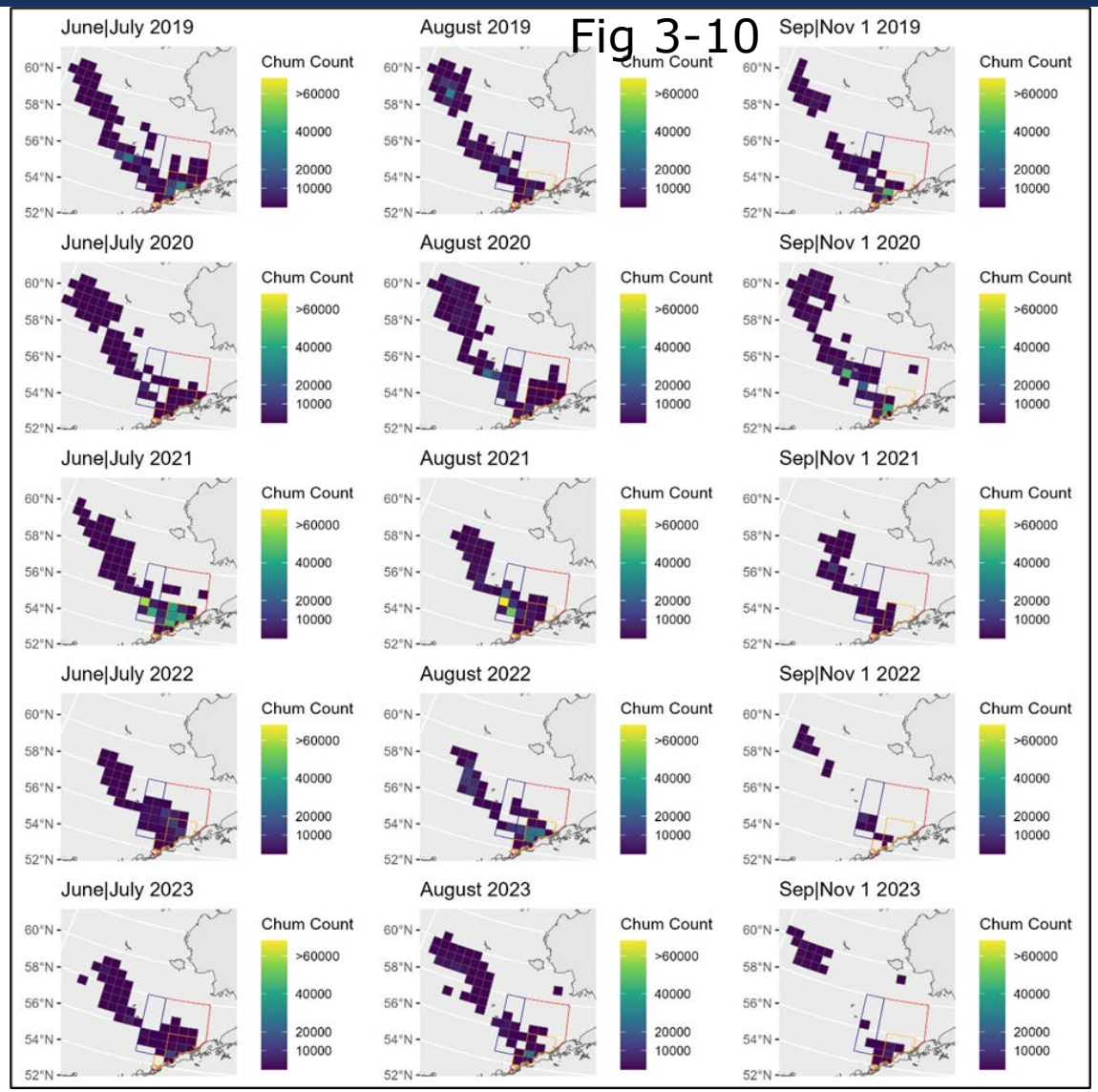
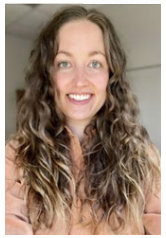


Figure 3-9 Rolling hotspot closure areas for chum salmon avoidance, 2017–2023

Source: Sea State.

Fig 3-10





Western Alaska Chum Salmon Bycatch, Alternative 1

Section 3.2.4.1.3

WAK chum salmon typically encountered in higher proportions near the Alaska Peninsula during the “Early period” (June 10 - mid-August)

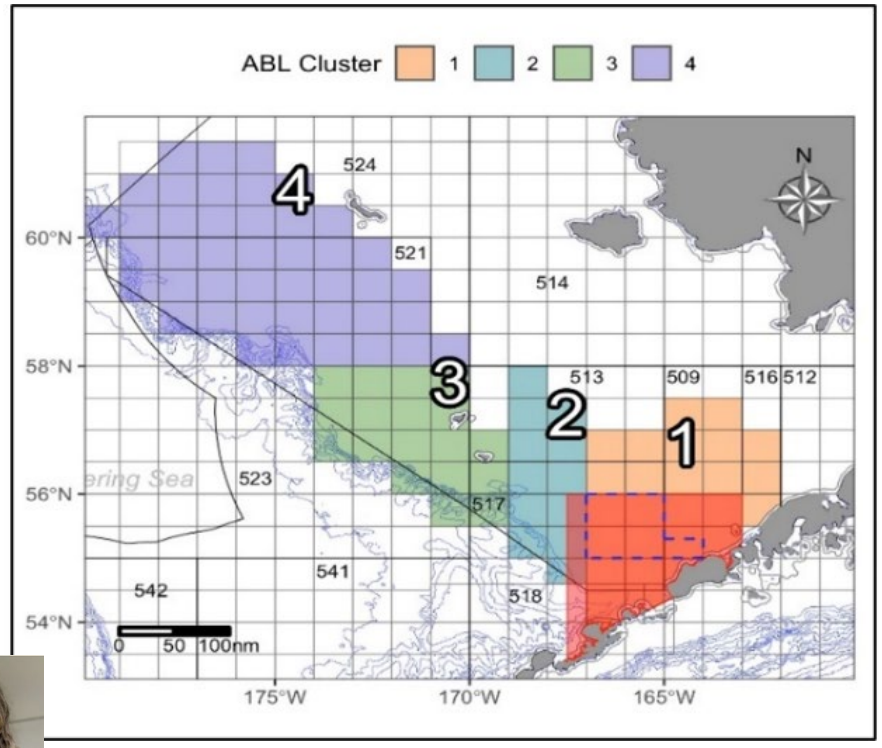
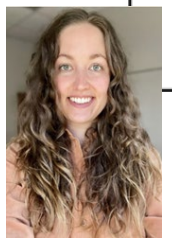


Figure 1-6 Map of four genetic cluster areas as well as the CVOA (red) and Chum Salmon Savings Area (blue dotted line)

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%

Notes: Hyphens are used to denote absent values (non-estimable proportions) due to sample size limitations.



Simplified Chum Salmon Adult Equivalents (AEQ) Analysis

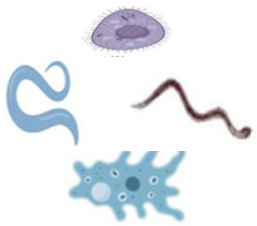
Section 3.2.4.1.4

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

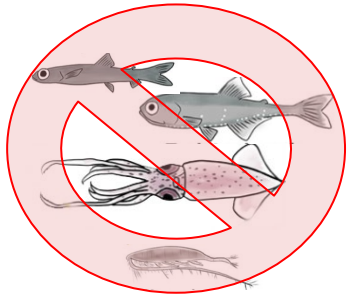
What it provides: an estimate of the number of chum salmon that, had they not been caught as bycatch in the ocean, would have returned to their rivers of origin

Pollock fishery primarily encounters age 3-5 chum salmon

Discounts natural mortality



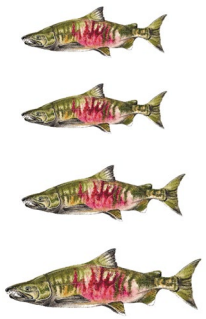
Disease/ Parasites



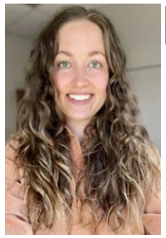
Starvation

Predation

Accounts for maturation



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



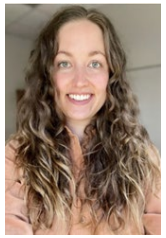
Simplified Chum Salmon Adult Equivalents (AEQ) Analysis

Section 3.2.4.1.4

Information needed to complete an AEQ analysis:

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

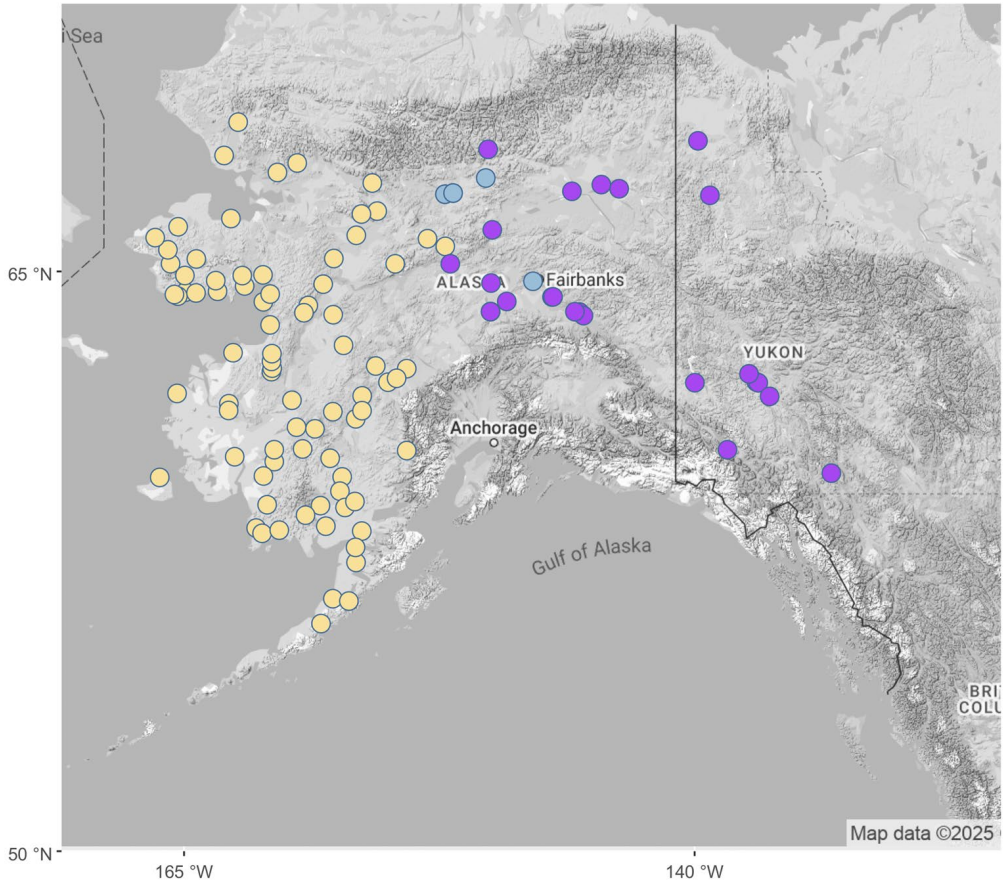


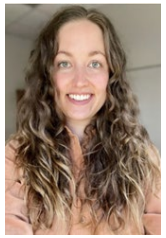
AEQ Estimates Provided for CWAK & Upper/Middle Yukon

Reanalysis of genetic data with management based baseline

5 Up/Mid Yukon pops classified as Summer run:

- Henshaw Creek Late
- S. Fork Koyukuk R.
- Jim R.
- Chena R.
- Salcha R.





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

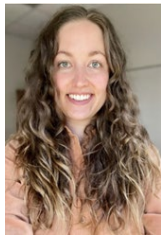
Year	Total B Season Bycatch	CWAK		Upper/Mid Yukon	
		B season	AEQ	B season	AEQ
2011	191,311	31,623	21,848	14,276	10,564
2012	22,172	3,152	11,608	1,407	3,126
2013	125,114	27,364	20,815	3,643	2,629
2014	218,886	40,137	31,784	3,171	3,145
2015	233,085	37,090	31,011	6,805	5,239
2016	339,236	67,062	51,950	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

“Propagation effect”

- 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

Impact rate = AEQ/(AEQ + 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%

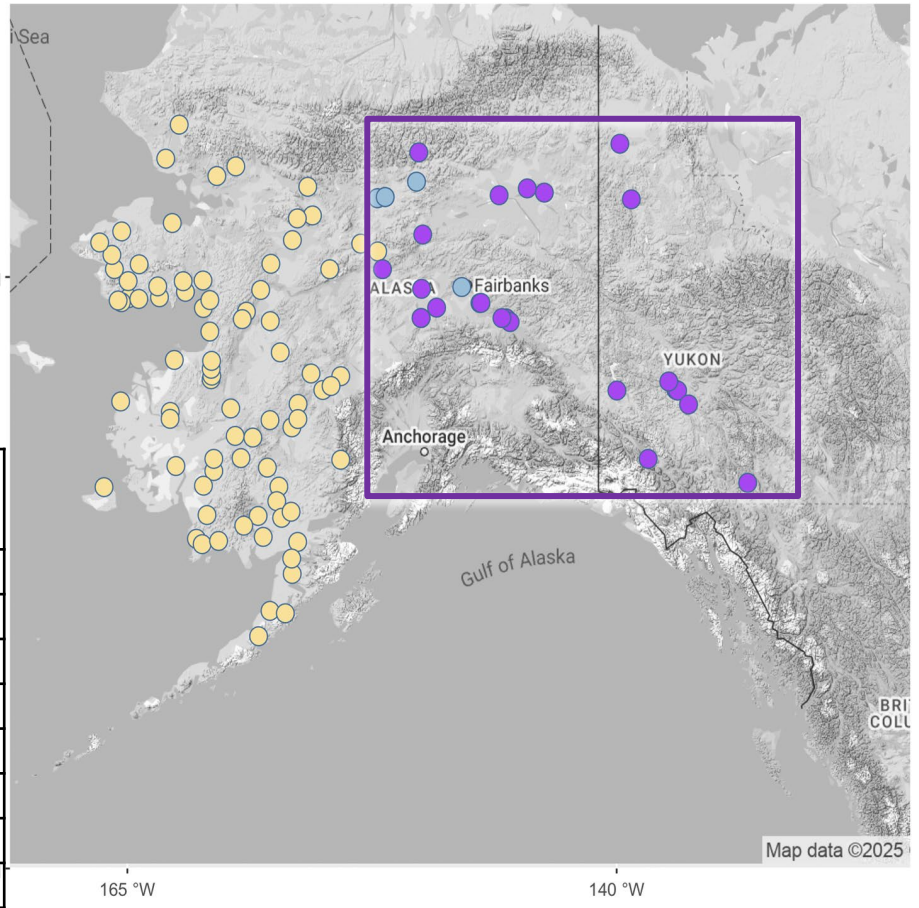
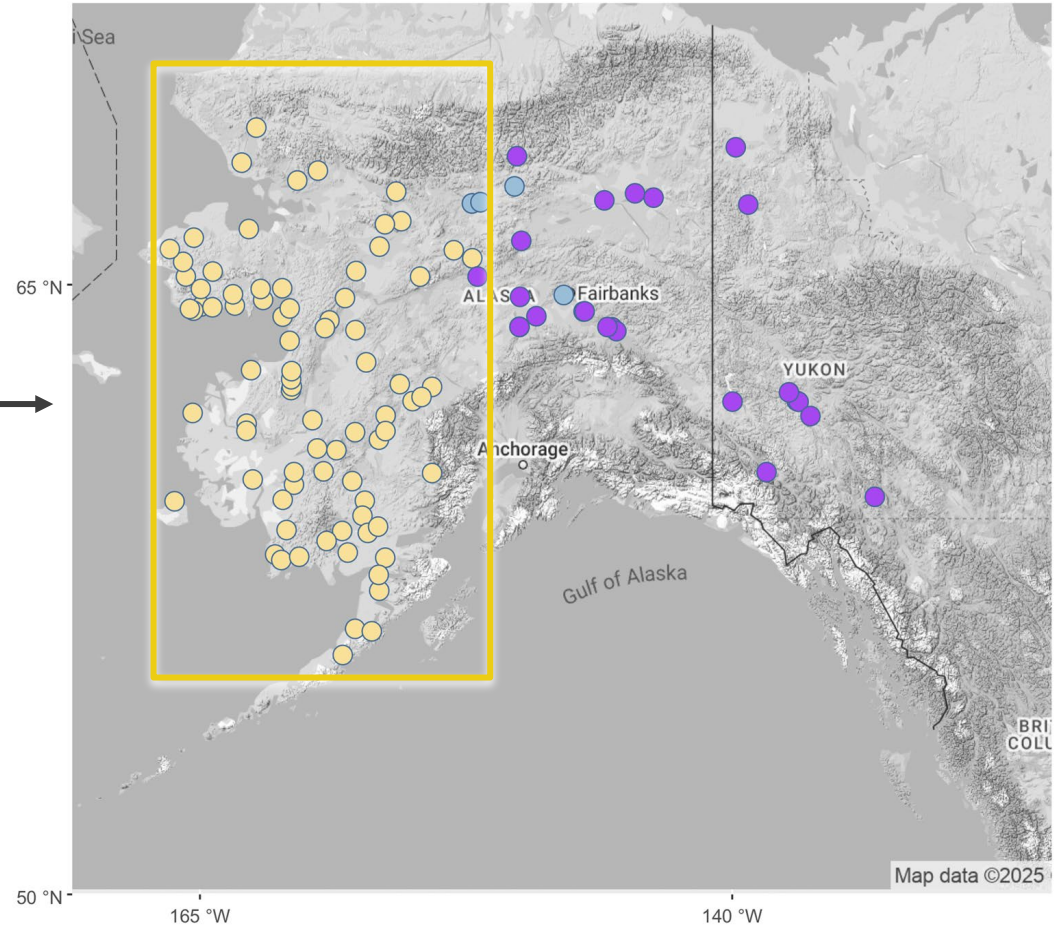


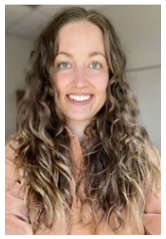
Table 3-16, pg. 102

Approach to Analyzing the Bycatch Removals of CWAK Chum

Section 3.2.4.1.2

No composite run size available to complete an impact rate

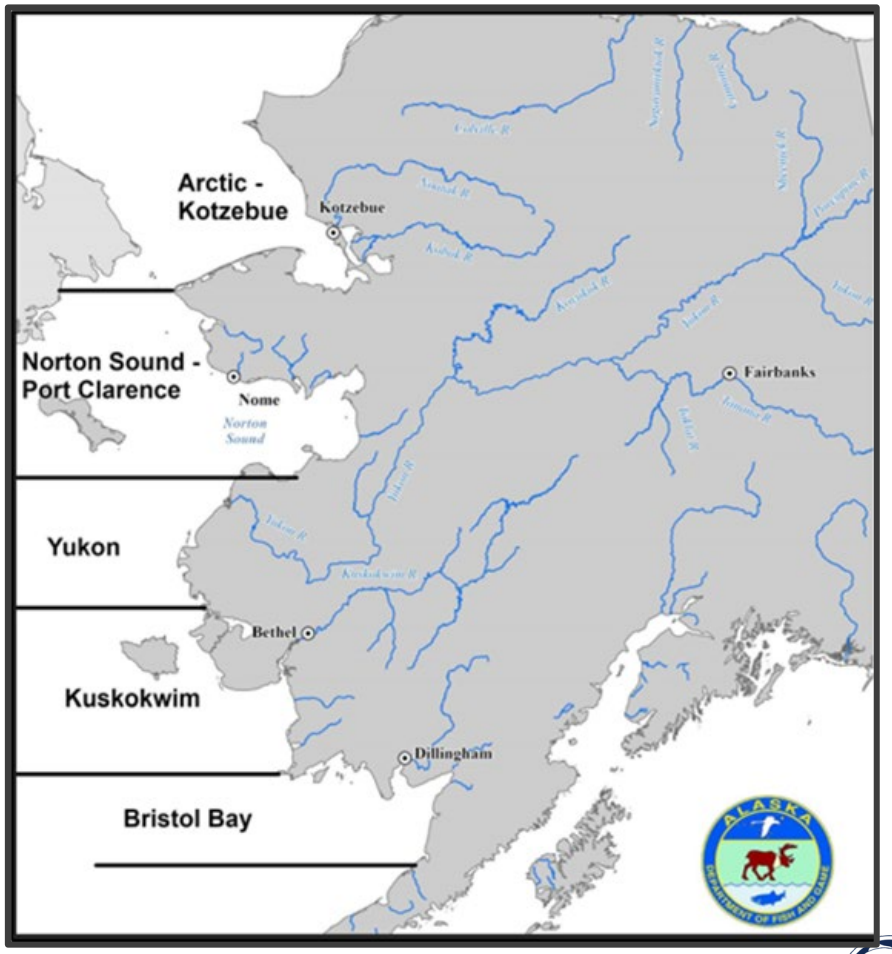


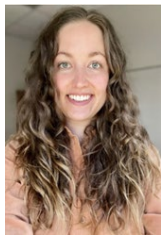


Comparison to Other Sources of Removals

Section 3.2.4.1.2

- Purpose was to contextualize PSC removals of chum salmon attributed to the CWAK reporting group – not intended to be used as an impact rate
- Compared AEQ CWAK estimates 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

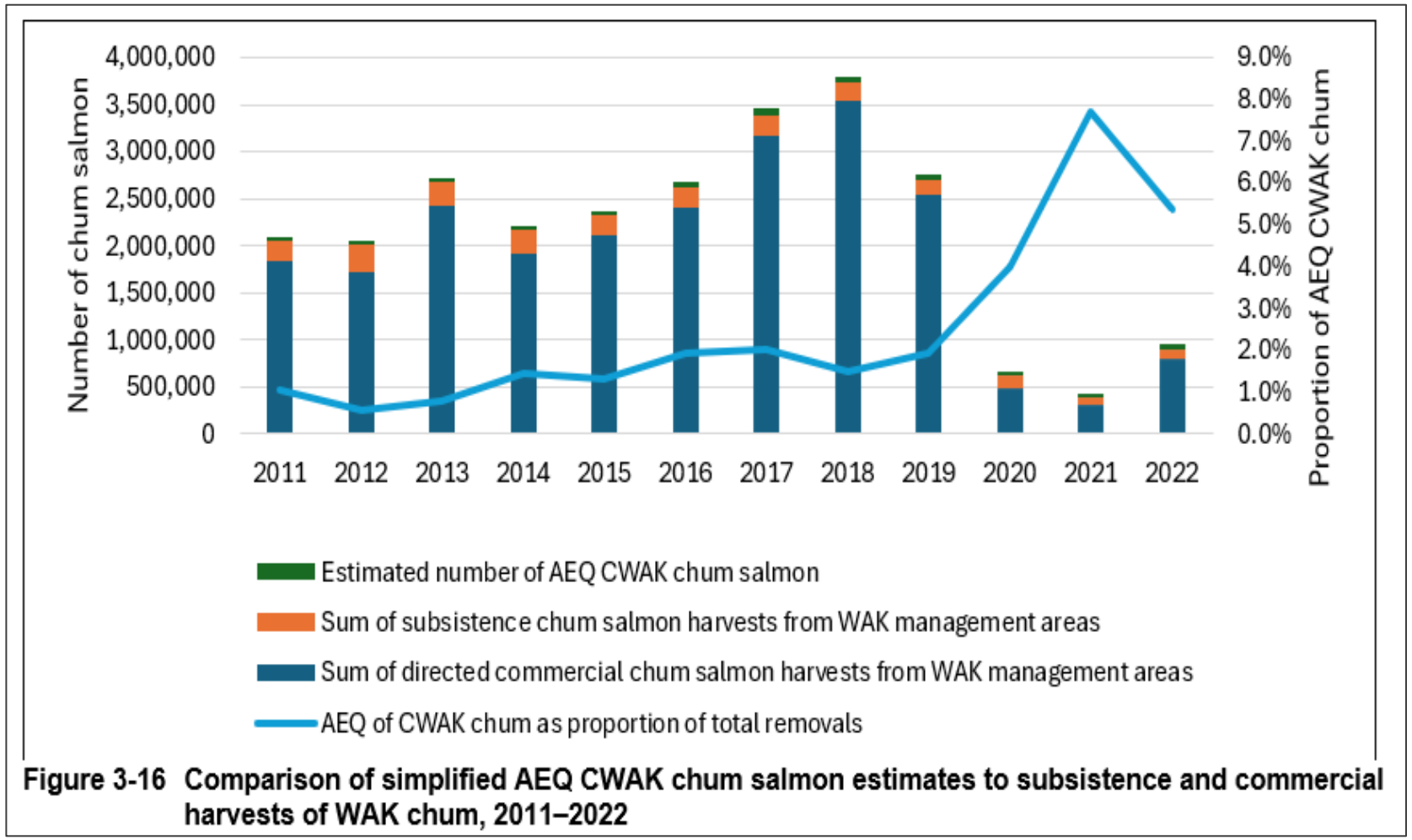
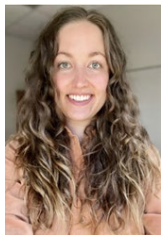


Figure 3-16 Comparison of simplified AEQ CWAK chum salmon estimates to subsistence and commercial harvests of WAK chum, 2011–2022

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



Total Chum Salmon Bycatch Reductions, Alternative 2

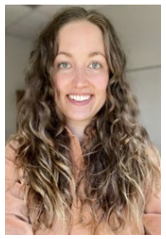
Section 3.2.4.2.1

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

- **100,000:** CDQ in 5 or 6 years; CP in 10 or 11 years; mothership in 10 years; inshore in 12 years
- **325,000:** CDQ in 2 or 3 years; CP in 2-6 years; mothership in 4 years; inshore in 2 or 5 years
- **550,000:** CDQ in 2 years; CP in 1 or 2 years; mothership in 0 or 1 year; inshore in 0 or 1 year

Additional Takeaways:

- Retrospective savings estimates based on early B season closures were high in some years (2021, 2017, 2016)
- Caps predicted to have no or minimal effect in years with low historical bycatch (2012)
- Across years, highest fleet-wide PSC reductions occurred under 100,000 cap using pro-rata apportionment (56.4% from status quo)
- As the cap amount increases, 3-year average apportionment estimated to result in higher savings
  - 12.4% reduction from status quo under a 325,000-cap using 3-year average split
  - 3.6% reduction from status quo under a 550,000-cap using 3-year average spit



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

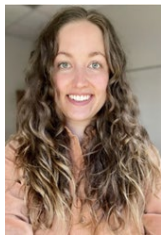
AEQ Upper/Middle Yukon Savings Estimates, Alternative 2

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

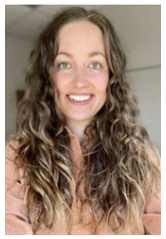


Implications Specific to Alternative 3

Section 3.2.4.2.4

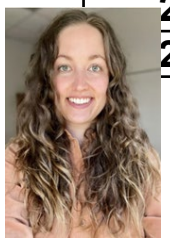
When would a cap have been in effect?

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

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

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

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
  - Target areas with low bycatch rates *(all other factors being equal)*
- Proportion of WAK chum in the total bycatch varies each year
- ***But*** reducing total chum salmon PSC could reduce WAK chum bycatch

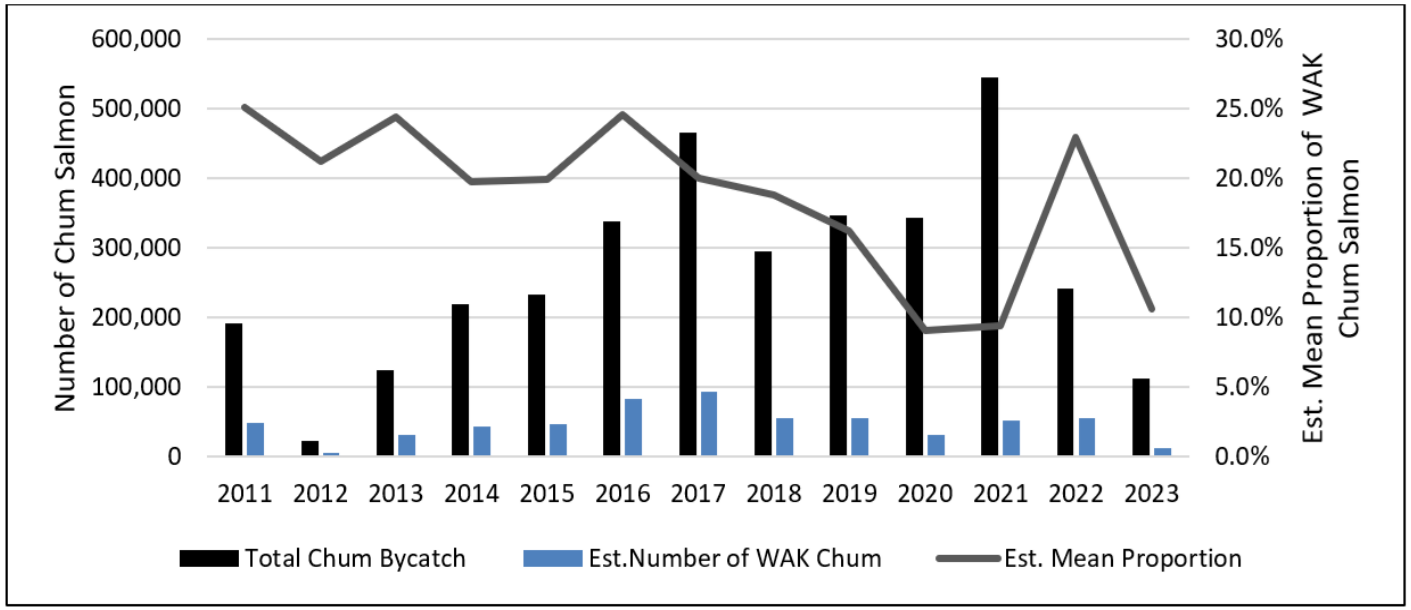
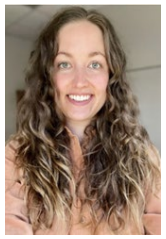


Figure 3-17 Comparison of the total B season chum salmon bycatch, estimated number of WAK chum salmon, and estimated mean proportion of WAK chum salmon in the overall bycatch from 2011–2023



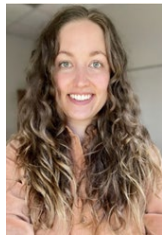
Alternative 4, Evaluation

Section 3.2.4.3

Provision	Assessment
1. Describe the use of historical genetic information	**Yes –** 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	**Yes –** Reduces the chance that PSC rates would increase without a response
3. Require excluder devices be used throughout B season	**No –** CP and MSSIP currently require and common practice for Inshore SSIP to use, but it would *update regs to align with current practices*
4. Require outlier provisions	**Yes –** Incentive to perform equal or better than peers to not lose operational flexibility in future years.
5. Weekly reports to WAK chum salmon users	**No –** Focused on information sharing.
6. Prohibit fishing in areas with very high bycatch rates	**Yes –** 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

Most provisions have the potential to reduce bycatch compared to status quo

- Recent years' bycatch reductions have *coincided* with IPA changes
  - From 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
- Other factors likely affecting reductions***, but without modifying regulations, IPAs could be changed in the future***



Response to SSC comments

Impact Analysis for Alternative 5

Section 3.2.4.4.1.2

Fleet Movement Model

1. Determine weekly pollock catch and PSC inside and outside of a corridor
2. If a sector met its cap, catch was moved to stat areas outside on a weekly basis in proportion to where fishing occurred, ***but many weeks where no pollock catch occurred outside of the corridor – nowhere to move catch to***
3. 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

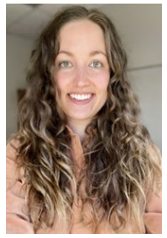


Table 3-33 Proportion of weeks where a sector did not have any fishing history outside of a corridor after a closure would have occurred in each year, 2011–2023

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.

Bycatch Rates and Pollock Catch

Section 3.2.4.4.1.3

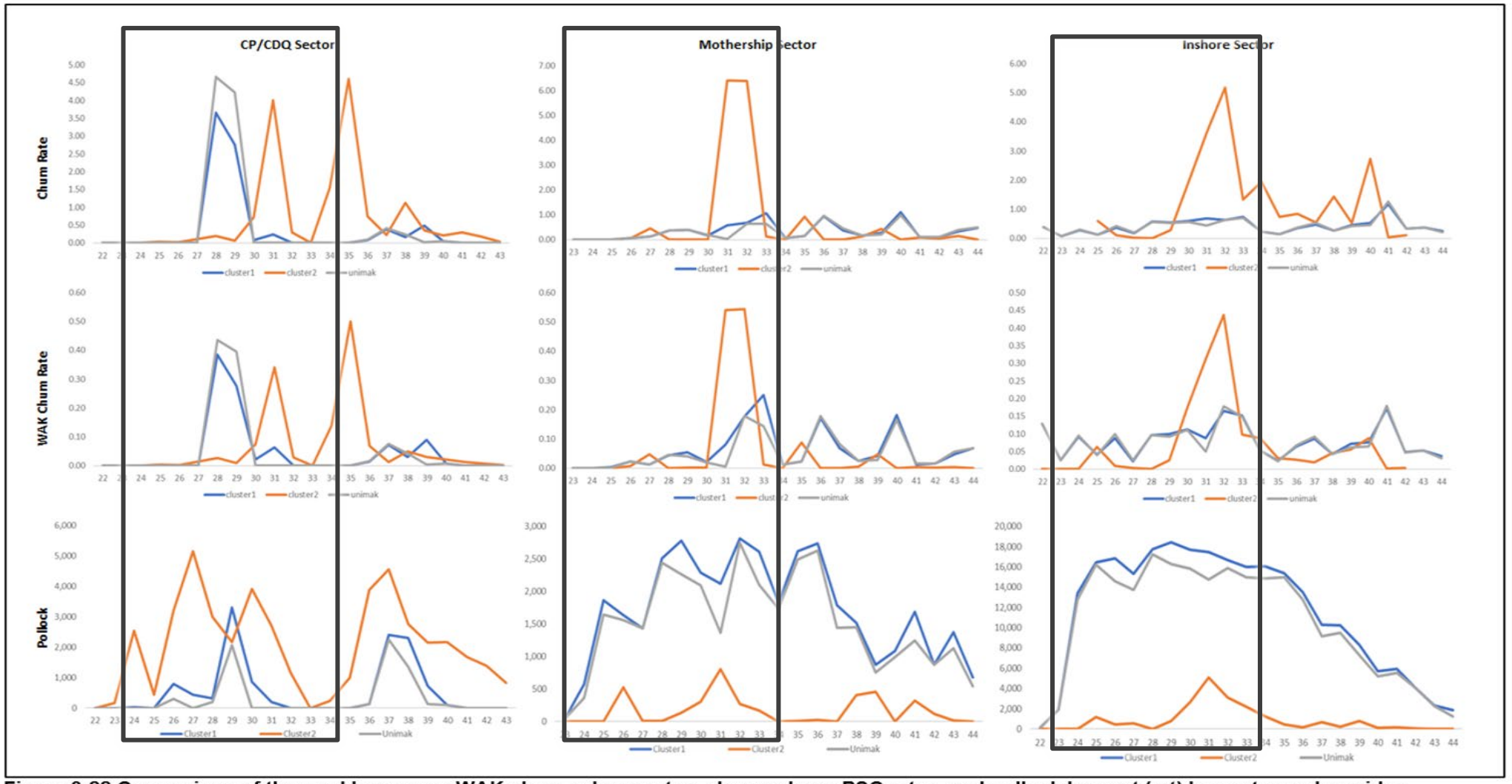
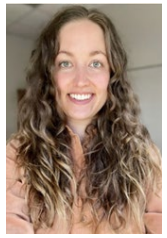


Figure 3-22 Comparison of the weekly average WAK chum salmon rates, chum salmon PSC rates, and pollock harvest (mt) by sector and corridor under Alternative 5, 2019–2023

Notes: CP and CDQ are combined.

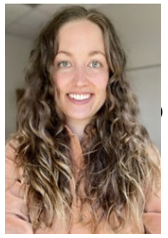


Factors Likely to Affect Movement Behavior

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 of the “shelf edge”



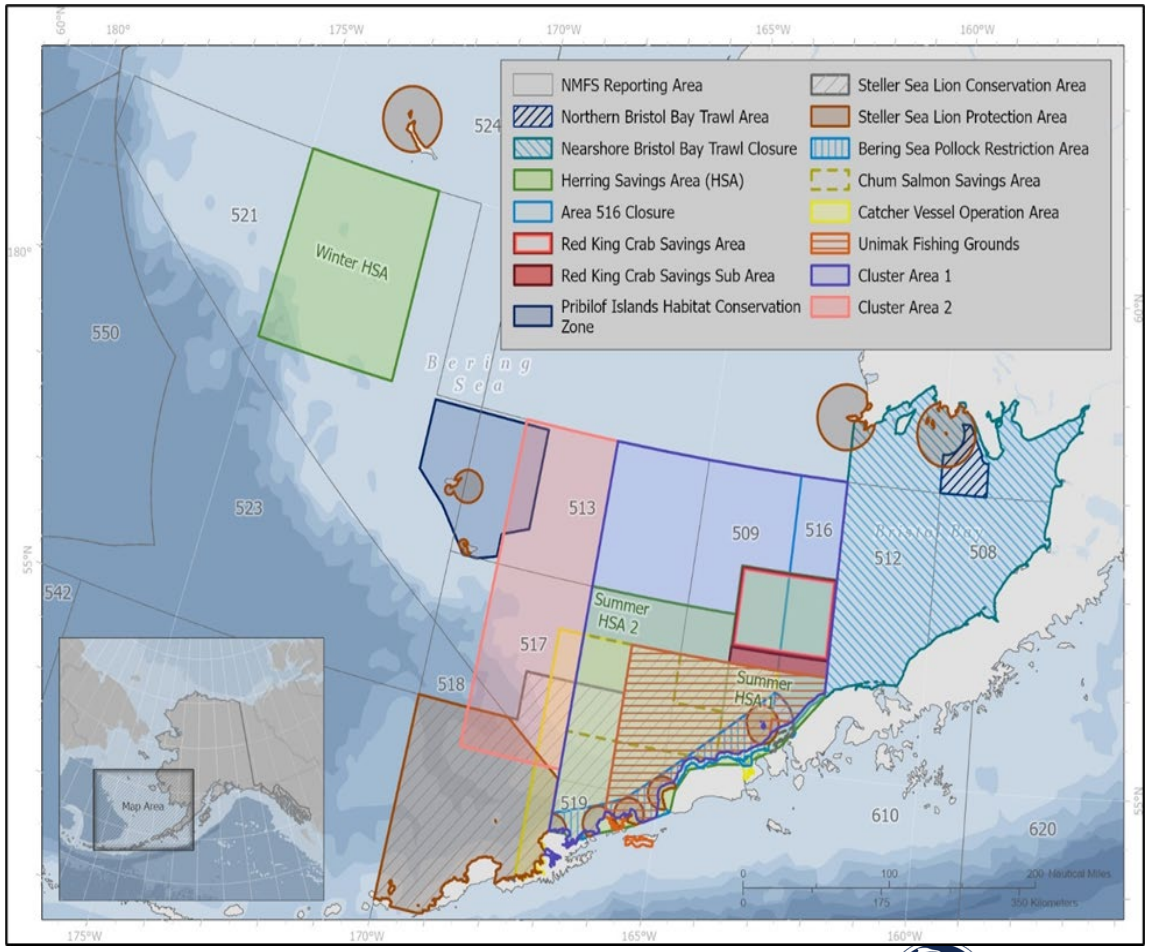


Figure 3-23 Inseason corridor areas under Alternative 5 and other relevant groundfish management area boundaries in the Bering Sea

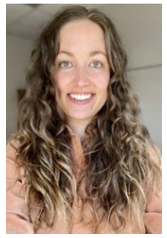
Potential Impacts on Chum and WAK Chum Salmon PSC

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.

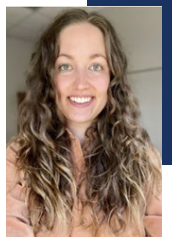
  high concentrations of pollock and catch

- 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**	**Benefit Scenario:** vessels are stay below the cap inside Cluster 1, resulting in chum and WAK chum salmon savings. **Unintended Consequence:** 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.	
	Unimak	**Benefit Scenario:** Similar to Cluster 1 as Unimak is fully embedded within. **Unintended Consequence:** Similar risk to Cluster 1 but potentially less because vessels *could* fish on the edge, inside Cluster 1; may not be feasible pending aggregations of pollock and other PSC considerations.	
	Cluster 2	**Benefit Scenario:** Sectors may proactively avoid fishing in area with historically high bycatch rates and/or carefully monitor PSC when fishing inside. **Unintended Consequence**: Low risk to creating adverse outcomes compared to status quo and other corridors. Vessels expected to target fishing in historically common areas	**Benefit Scenario:** Lower proportion of WAK chum inside Cluster 2 compared to Cluster 1 and Unimak, but proactively avoiding and/or monitoring chum bycatch. **Unintended Consequence** Similar to total chum salmon PSC.

Chinook Salmon and Herring Bycatch



Chinook Salmon Bycatch, Alternative 1

Section 3.3

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

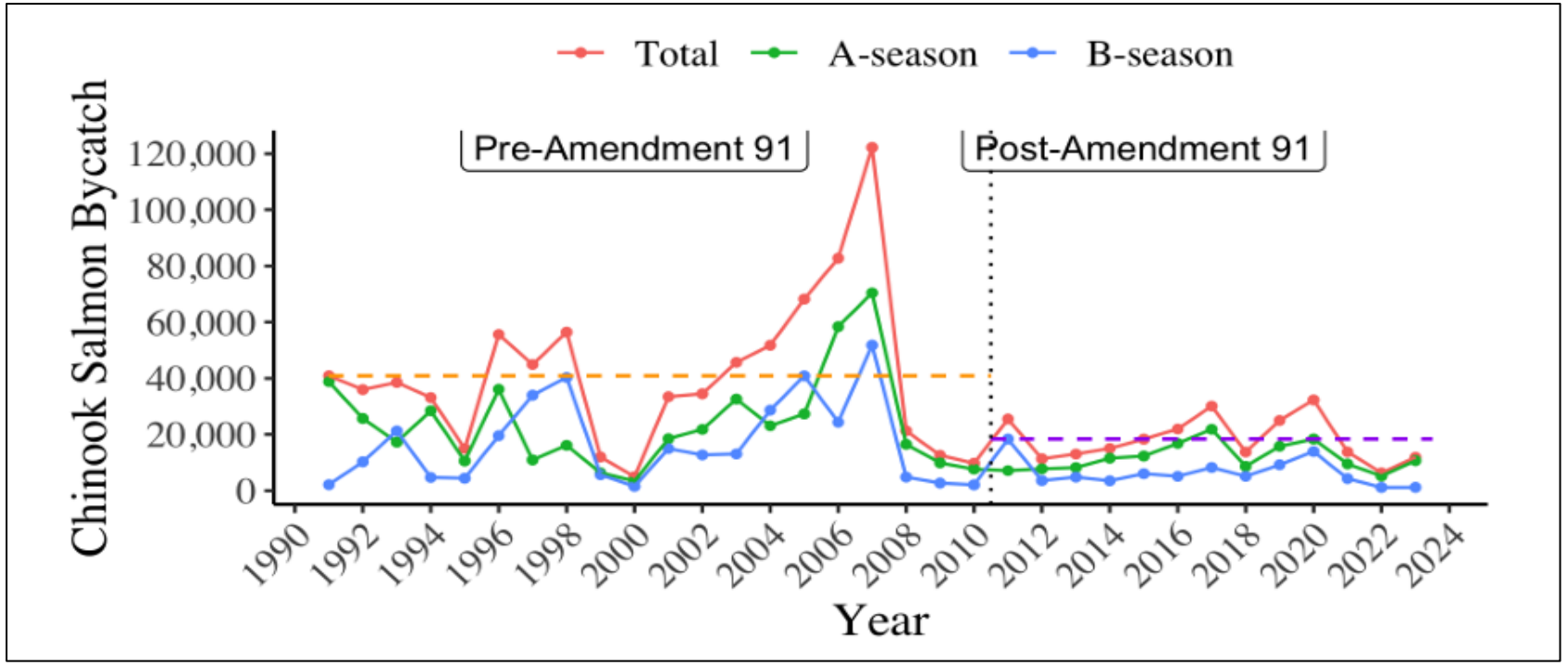
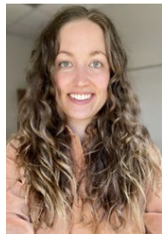


Fig 3-24



Chinook Salmon Bycatch, Alternative 1

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.

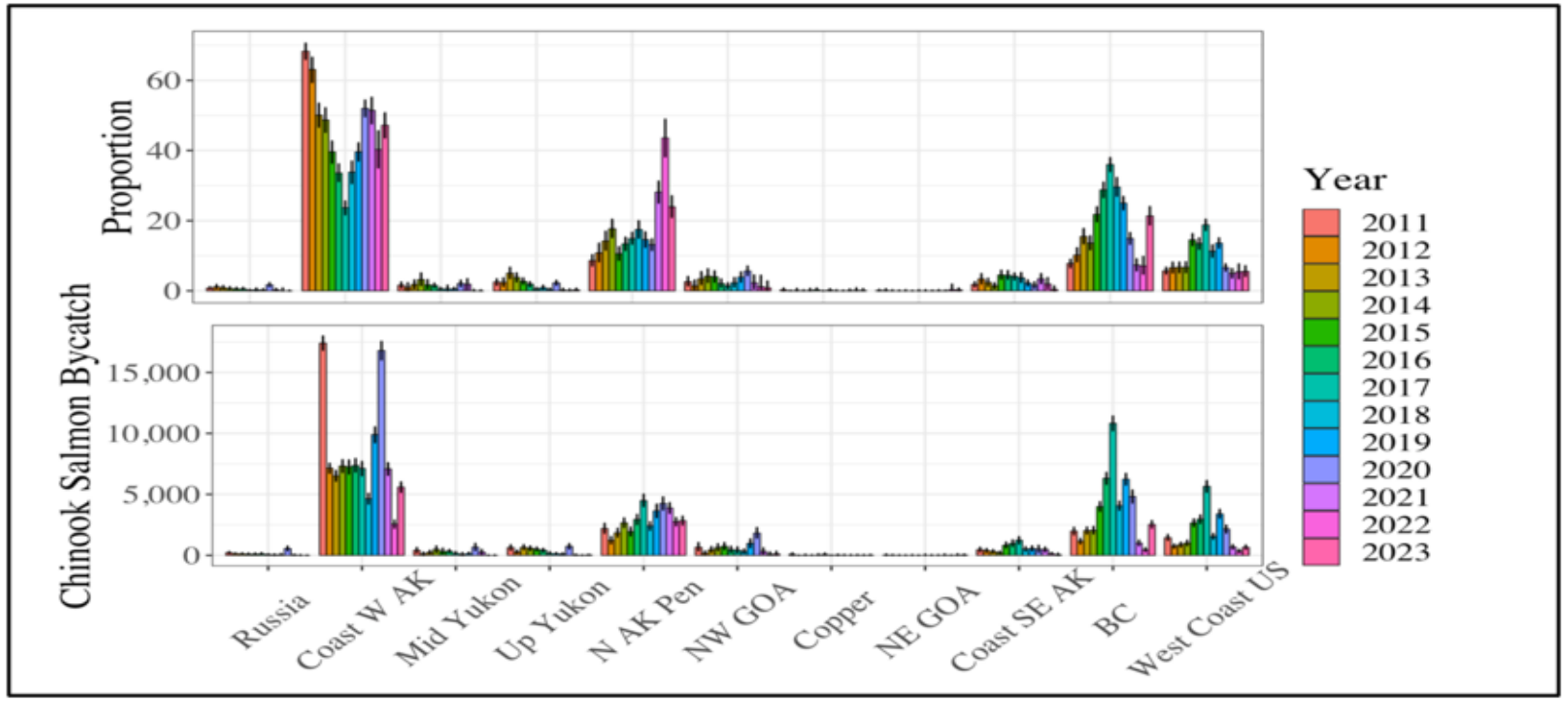
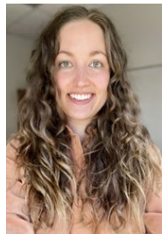


Figure 3-27 Annual stock composition estimates (top) and estimated number of Chinook salmon bycatch (bottom) with their 95% credible intervals (black line) in the Bering Sea pollock fishery, 2011–2023

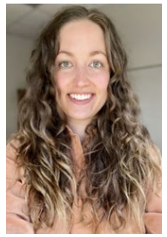
Source: Barry et al. (2024)



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

Year	Upper Yukon	CWAK
2011	0.4% (0.3% - 0.5%)	1.7% (1.6% - 1.8%)
2012	0.5% (0.4% - 0.6%)	2.5% (2.3% - 2.8%)
2013	0.6% (0.5% - 0.8%)	2.3% (2.1% - 2.6%)
2014	0.4% (0.3% - 0.6%)	2.2% (2.0% - 2.4%)
2015	0.3% (0.3% - 0.4%)	1.4% (1.2% - 1.5%)
2016	0.4% (0.3% - 0.5%)	1.6% (1.5% - 1.7%)
2017	0.3% (0.3% - 0.4%)	1.6% (1.5% - 1.8%)
2018	0.3% (0.2% - 0.4%)	1.4% (1.2% - 1.5%)
2019	0.2% (0.2% - 0.3%)	1.2% (1.1% - 1.3%)
2020	0.7% (0.6% - 0.9%)	3.6% (3.4% - 3.8%)
2021	0.8% (0.6% - 1.0%)	3.0% (2.8% - 3.4%)
2022	1.1% (0.9% - 1.5%)	2.1% (1.8% - 2.3%)
2023	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 outcomes are varied
- Proposed alternatives do not create incentives for Chinook avoidance
- How the pollock fleet reacts to new chum bycatch measures would determine outcomes for Chinook
- The timing of Chinook and chum encounters are dissimilar – **a primary consideration for Chinook impacts is whether the B season would be extended**
- Potential for bycatch reductions is less than Alternative 2, but potential risk for adverse effects is also less

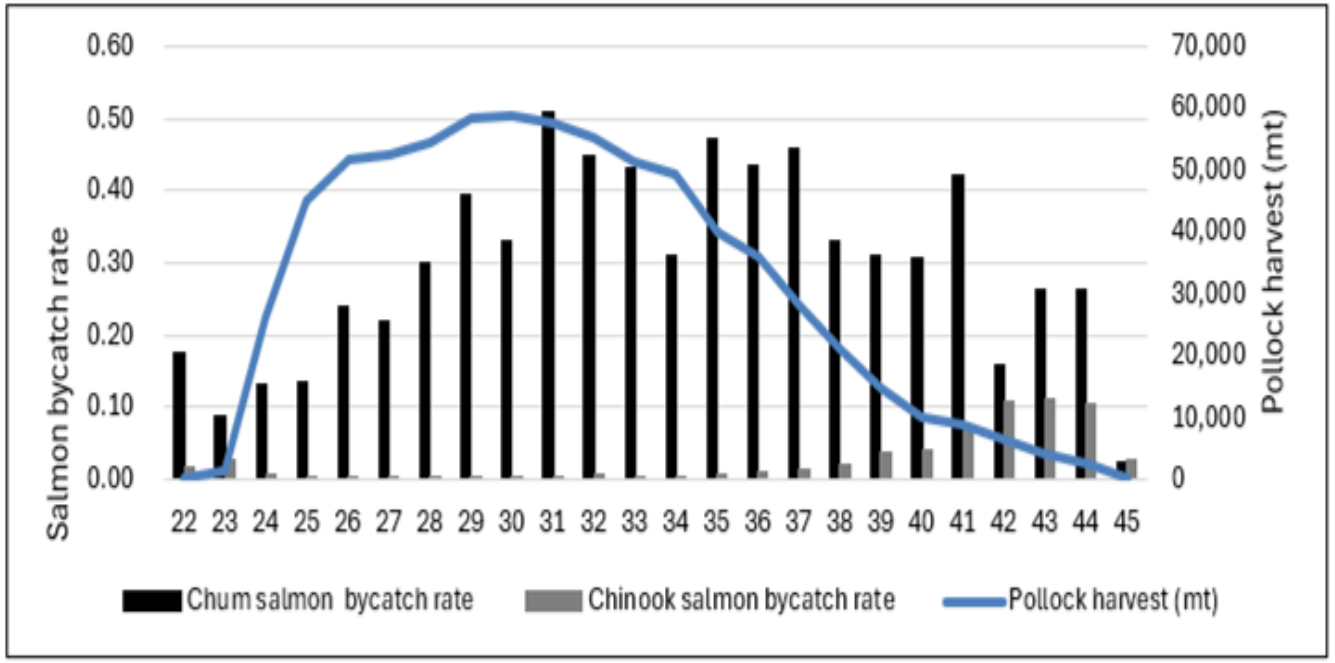
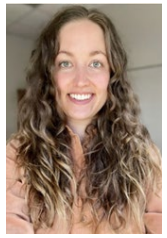


Figure 3-29 Comparison of the weekly fleet-wide weekly average chum salmon bycatch rate, Chinook salmon bycatch rate, and pollock harvest (mt), 2011–2023

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



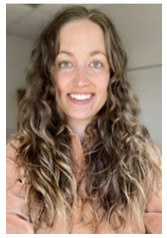
Impacts on Chinook Salmon Bycatch, Alternatives 4 and 5

Section 3.3.3 and 3.3.4

Alternative 4 – not expected to result in adverse impacts to Chinook salmon PSC – Fleet has operated under the IPAs since 2010, and Alt. 4 provisions reflect operations in recent years

Alternative 5

- Chinook bycatch rates across all corridors are very low during the closure window (Figure 3-30, pg. 151), but increase during September and October in all corridors
  - The largest amounts of displaced pollock catch were estimated from Cluster 1, followed by Unimak
  - A Cluster 2 corridor could move CPs further northwest, and the inshore and mothership CVs would move to historically productive fishing grounds in Cluster 1 and Unimak *(all other considerations being equal)*



Impacts on Herring Bycatch, Alternatives 2-5

Section 3.3.3 and 3.4.1

Herring outcomes could be positive, neutral, or adverse under Alts. 2, 3, and 5

- Greater emphasis on potential operational trade-offs and spatial interactions with herring PSC
- 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 with potential for unintended, adverse effects under Alternatives 2, 3, and 5
  - Fishery may inadvertently trigger the HSAs while avoiding chum salmon

These dynamics create uncertainty in the outcomes for herring PSC

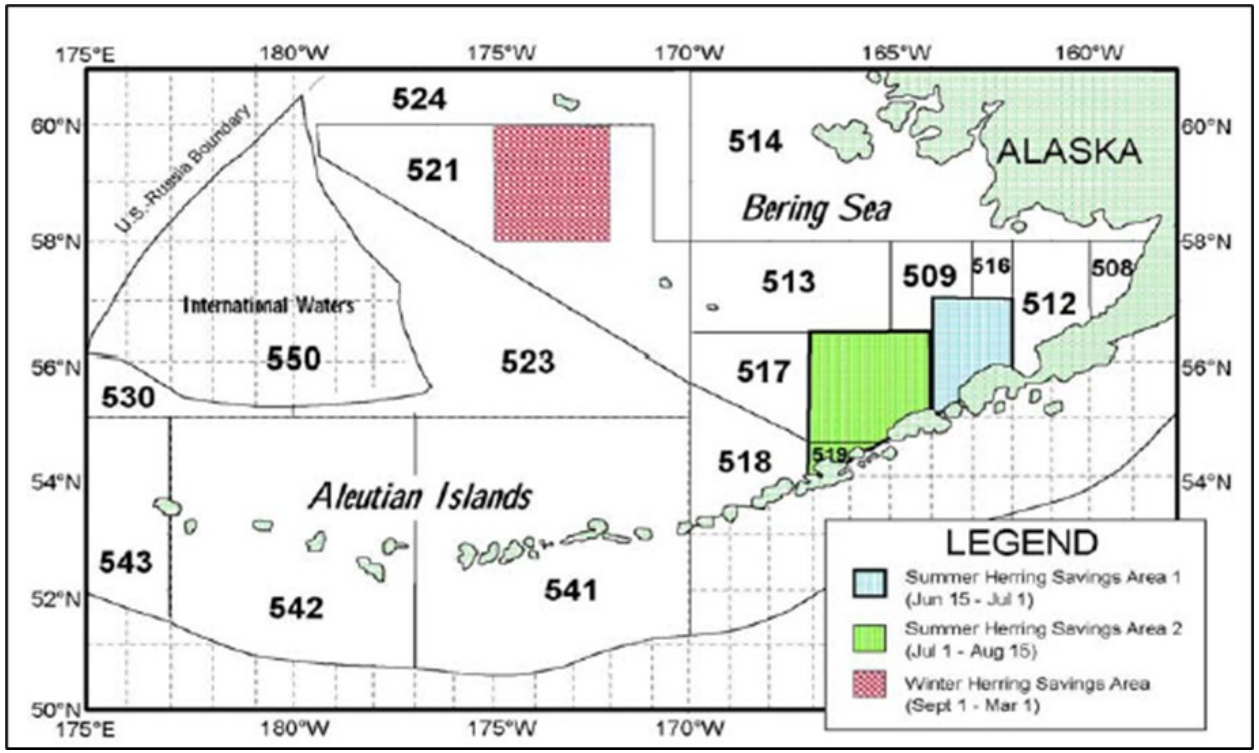
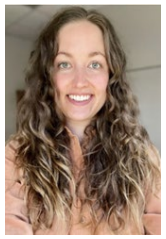


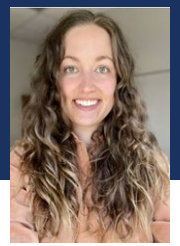
Figure 3-32 Herring Savings Areas



Dutch Harbor, ASMI Industry and Partner Use

Social and Economic Assessment (Chapter 4)

Bering Sea Pollock Fishery



Impacts to the Pollock Fishery, Alternative 1

Section 4.1 provides current pollock fishery participation and conditions.

- AFA sectors, associated processors, associated communities, market dynamics.
- For CDQ groups and communities, including CDQ pollock quota, additional investments in AFA, and community benefits funded in programs supported by these revenue.

Section 4.2.1 references these sections and impacts related to this fishery that may continue under status quo regulations.

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

- 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.

- Analysis cannot quantify the magnitude of these impacts, depends on PSC limit/ apportionments, specific vessel characteristics, how behavior changes; however, some level of adverse impact is likely from the risk of a chum salmon PSC limit.
- Individual vessels, companies, shoreside processors will need to evaluate options preseason if the risk of a closure is high.

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

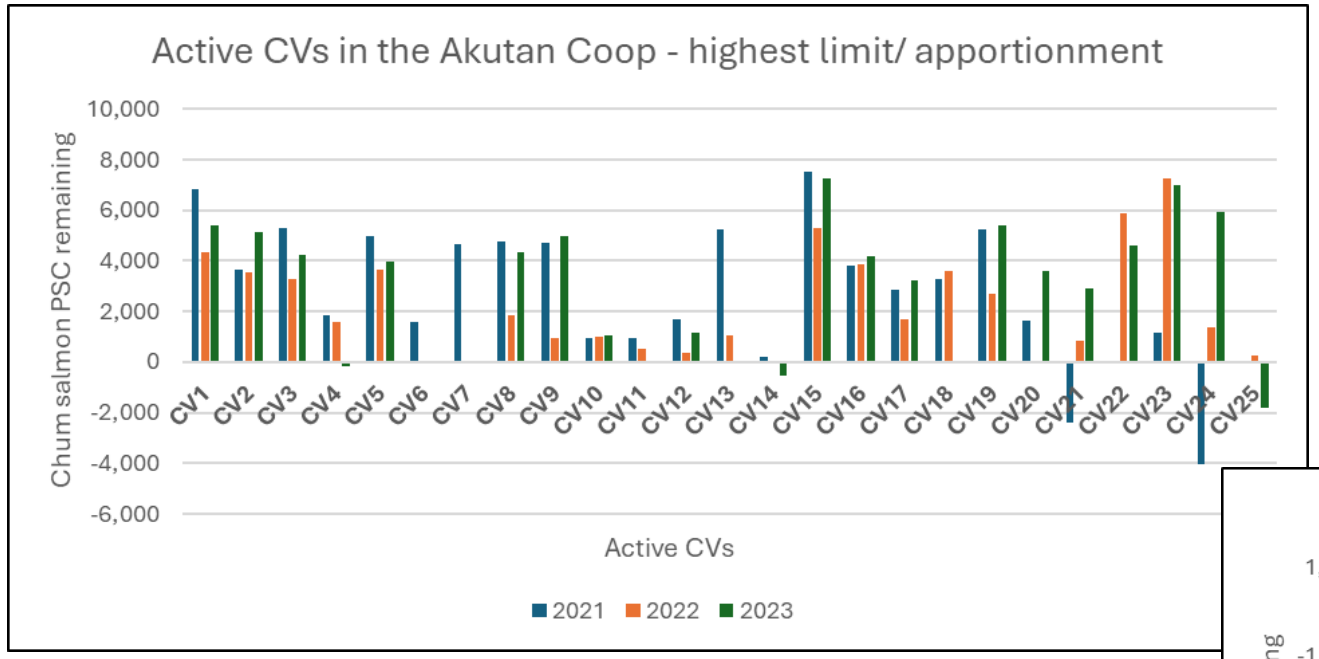
- The likelihood and potential magnitude of these impacts are anchored by **forgone revenue** analysis.
- Provides an upper bound on possible closures and possible direct forgone revenue.
- Max forgone wholesale revenue potential of $714 million across fleet (2018 with AFA apportionment).

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

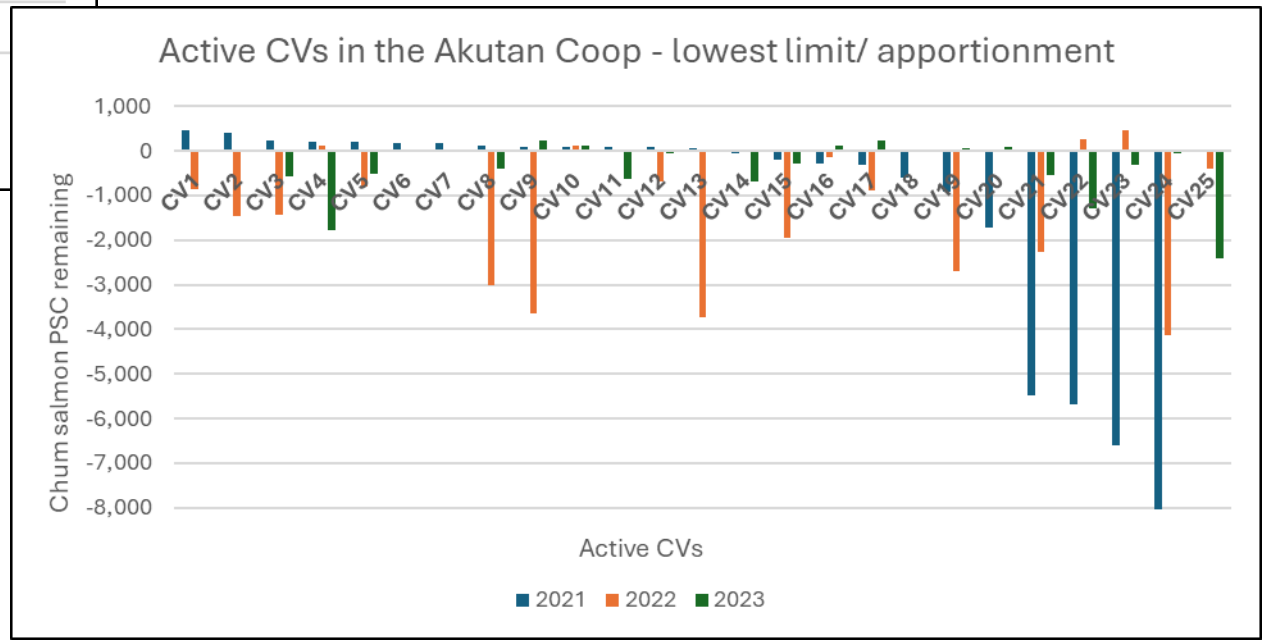
Sector	Apportionment	100,000 PSC limit			325,000 PSC limit			550,000 PSC limit		
		Number of years closed (out of 13)	Average forgone revenue (million of 2022$)	% reduction in average B season forgone revenue	Number of years closed (out of 13)	Average forgone revenue (million of 2022$)	% reduction in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



- AP requested a vessel-level impact analysis
- Provided in Appendix 6 using an extension of the retrospective methods and the inshore Chinook vessels apportionments as an example.



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

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 new 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

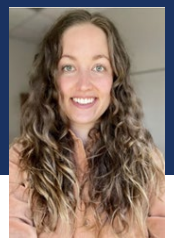
Pollock sectors are expected to weigh the **risk** of corridor closures, but also the **consequences.**

1. Evaluated historical reliance of each sector, as well as operational constraints
   - Inshore and mothership sectors have high reliance on **Cluster 1** and **Unimak**
   - Inshore sector has less flexibility in how far from port they can travel (48-hour delivery standard) and smaller inshore CV disproportionately impacted from a **Cluster 1** or **Unimak** closure
   - CP/ CDQ have more reliance on **Cluster 2** than the other areas
2. Described impacts prior to corridor closures being met and impacts if the closures were met.
   - If the closure represents a high consequence for the sector, likely change behavior, to the extent they can, prior to closure
   - Depending on the cap, likely the case for inshore and mothership sectors in **Cluster 1** and **Unimak**.
3. Estimated "Revenue at risk" associated with potentially unharvested pollock - presents an ***unlikely*** upper bound for the likelihood of closures and the magnitude of revenue impacts.
   - Unharvested pollock may be possible for the inshore sector with a **Cluster 1** or **Unimak** cap, depending on cap.
   - Unharvested pollock could adversely impact associated harvesters, processors, crew, CDQ groups, and disrupt market opportunities.

Approach for Communities (Section 4.2.4.4):

- Based on analysis of pollock sectors, similar types of impacts as Alt. 2 and 3, considered the likelihood for adverse effects

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
Nushagak	No (all years)	No (all years)	No (all years)
Kuskokwim Bay	No (all years)	Yes (all years)	No (except 2023)
Kuskokwim River	Yes, limited (except 2020)	Limited (2020, 2021) No (2022, 2023)	Yes (except 2020)
Yukon River Summer Run	Limited (2020, 2023); yes (2021, 2022)	Limited (2020); yes (2021, 2022, 2023)	Limited 2020, 2023; no fishery 2021, 2022
Yukon River Fall Run	Limited (2020); yes (2021, 2022, 2023)	Yes (all years)	Yes (all years)
Norton Sound	No (all years)	Limited (all years)	No in 2020, 2021, 2022 Limited in 2023
Kotzebue	No (all years)	Limited (all years)	No (all years)

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

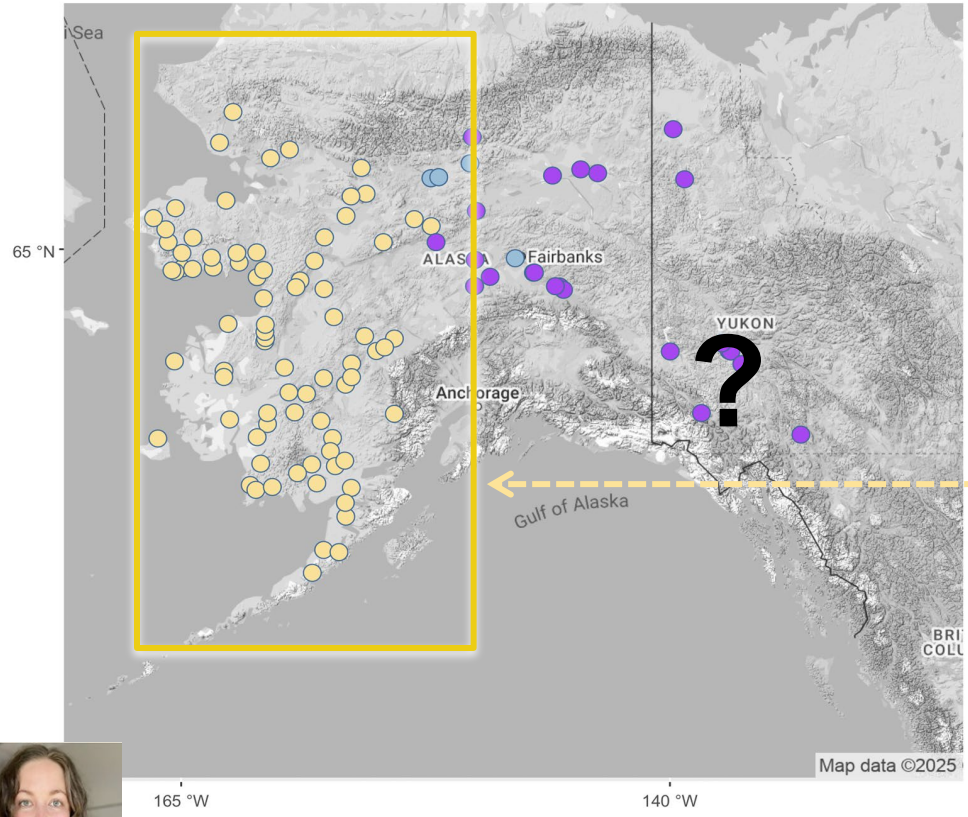
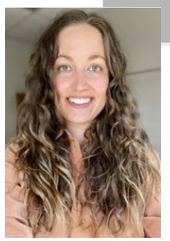


Table 3-21 Estimates on AEQ CWAK chum salmon savings

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

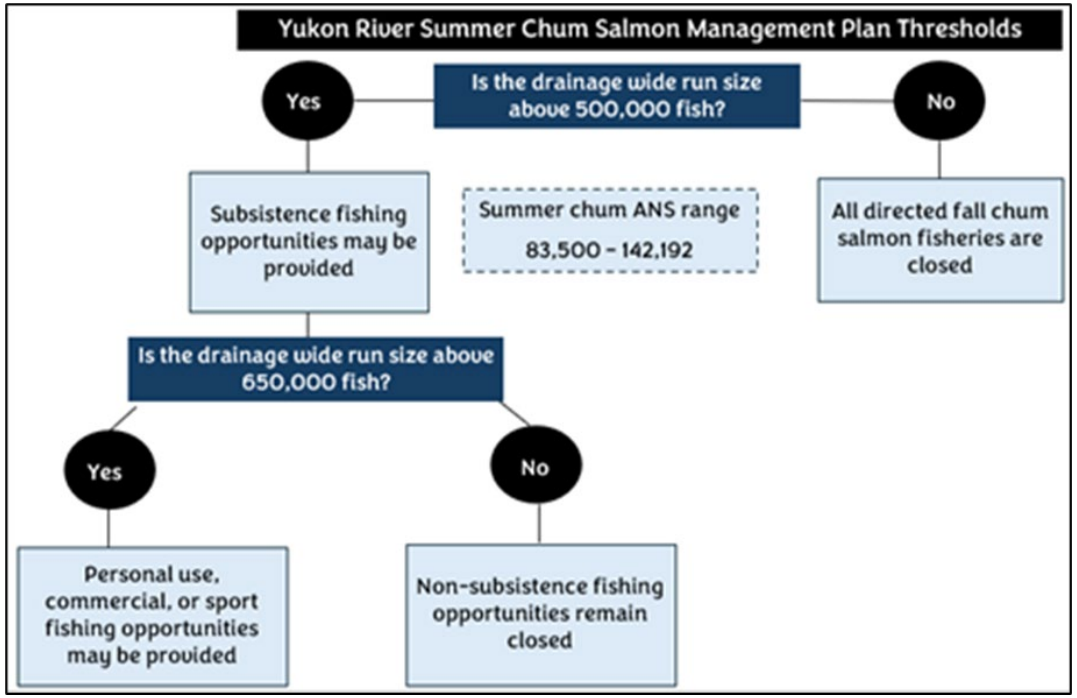


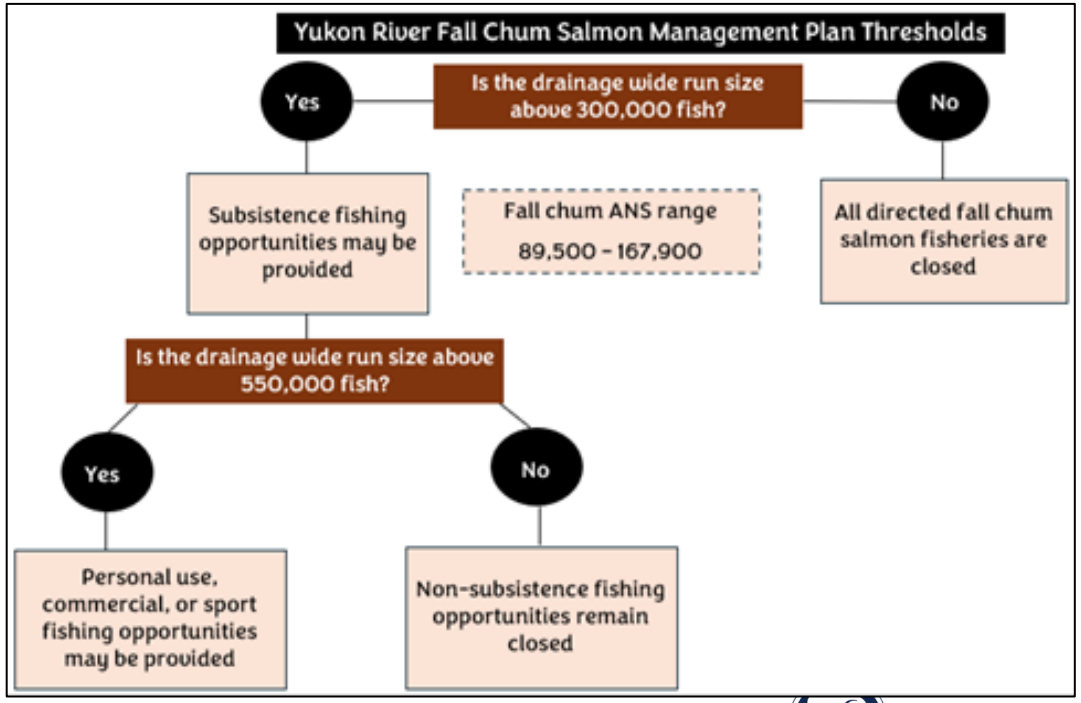
The proportion of AEQ CWAK chum salmon savings returning to these populations is unknown

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

CWAK reporting group includes Yukon summer chum in an unknown proportion

- ***But*** Yukon summer chum run reconstruction is available
  - Provides thorough estimate of escapement + harvests (*i.e., total run size*)
- ***And*** 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
Sector Apportionment 1, 3-yr avg.												
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
Sector Apportionment 1, 5-yr avg.												
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
Sector Apportionment 1, pro rata												
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
Sector Apportionment 1, AFA												
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**

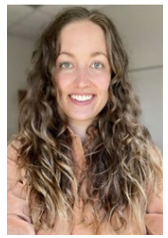
Potential Benefits, Alternatives 2 and 3

Section 4.4.2.1

	100,000 cap	3-year avg	5-year avg	pro rata	AFA	In-river markers	
2017	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

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

	100,000 cap	Est. Up/Mid Yukon Savings	In-river markers	
2017	3-year avg	11,553	Run size	2,315,883
	5-year avg	11,308	Subsistence?	Limited
	pro rata	11,441	ANS met?	No
	AFA	9,969	Commercial?	Yes
	100,000 cap	Est. Up/Mid Yukon Savings	In-river markers	
2021	3-year avg	3,207	Run size	95,249
	5-year avg	3,195	Subsistence?	No
	pro rata	3,203	ANS met?	No
	AFA	3,255	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

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.

1) 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	

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

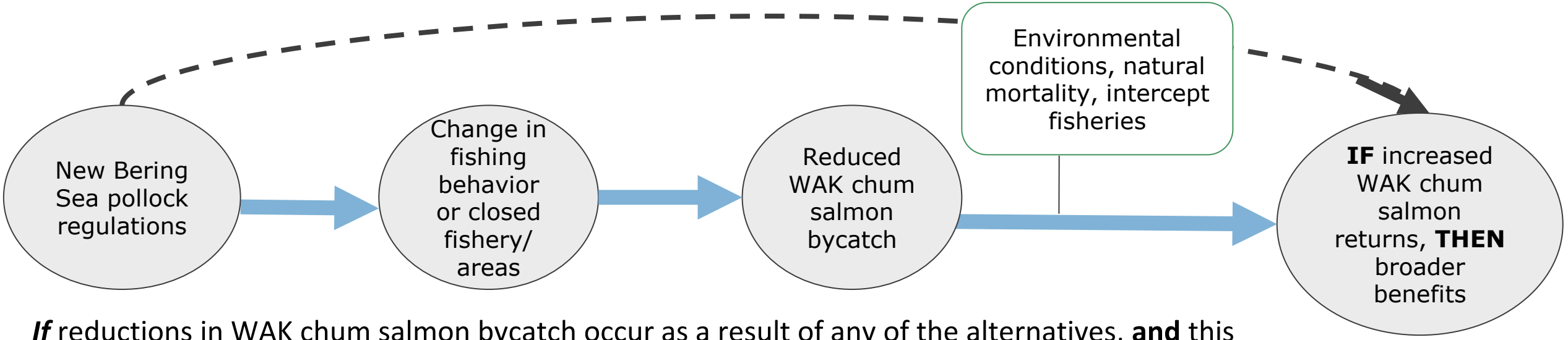
- Also considered the potential impacts to Chinook salmon PSC

  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

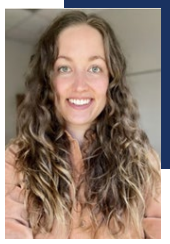
Food security and food sovereignty

Mental, physical and emotional health

* potential impacts discussed more by KRITFC and TCC


Dutch Harbor, ASMI Industry and Partner Use

Combined Effects of the Alternatives and Tradeoffs



Chapter 5

Incentive Structure Under a Combination of Alternatives

No action	Chum PSC limit	Chum PSC limit, triggered by abundance	IPA measures	Corridor cap
Alt 1	**Alt 2**	**Alt 3**	**Alt 4**	**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

Modified from Figure 5-1, page 319

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

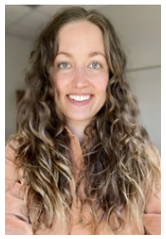
- More complex inseason decision making
- Incentives to minimize all chum salmon (not inherently WAK chum salmon) in corridor and outside
- The measure with greatest consequences and likelihood of occurring are most likely to drive behavior (this could be different by sector and the time of the season)

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

Potential Costs Under a Combination of Alternatives

Chapter 5

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

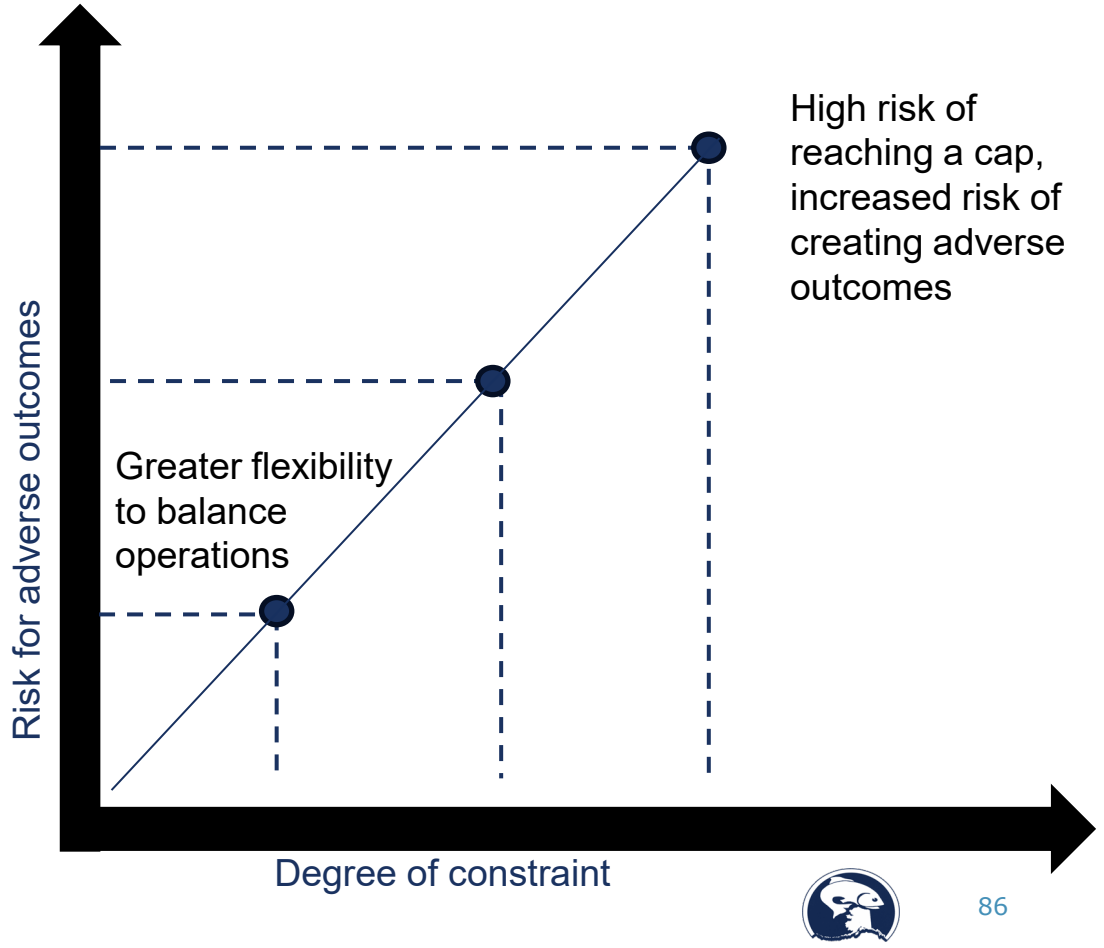
Summary of PSC and Policy Tradeoffs

Section 2.5

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

- Vessels would change their fishing behavior in response to PSC limits:
  - Move to new areas with lower bycatch rates
  - Use more frequent test tows
  - Slow the pace of fishing to account for each haul or offload
  - Cooperative may issue a stand down
- Behavior changes could divert pollock catch later into the B season

Move to new areas with potentially unknown PSC encounters or rates




Dutch Harbor, ASMI Industry and Partner Use

Management, Monitoring and Enforcement

Monitoring: NMFS counts all salmon bycatch

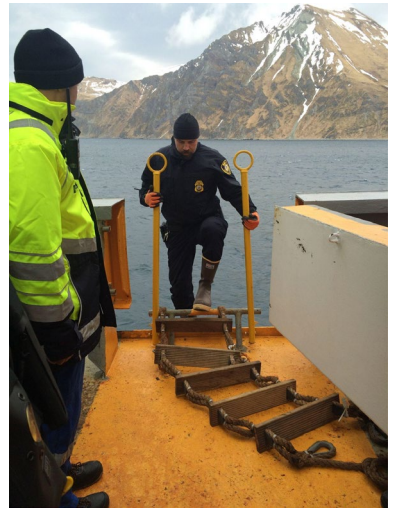
Fishery	Observer monitoring	Salmon discard prohibition	Salmon accounting	Salmon biologicals
Catcher Processor	✓ At-sea observers (200%)	✓ All salmon discards are prohibited	✓ All salmon are counted and identified to species	✓ Biological information, including genetic samples, on Chinook and chum salmon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

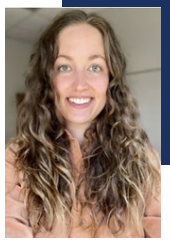
- Prohibited Species Catch limits (Alternatives, 2, 3, and 5)
  - NMFS monitors all Chinook PSC relative to the apportioned PSC for each sector, CDQ group, and cooperative.
  - If a sector, cooperative, or CDQ group exceeds its apportioned PSC, NMFS notifies the NOAA Office of Law Enforcement.
  - The 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.


Dutch Harbor, ASMI Industry and Partner Use

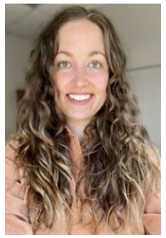
Final Points for Consideration



REMINDER of AP Action Under C2

At this meeting, the Council may:

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



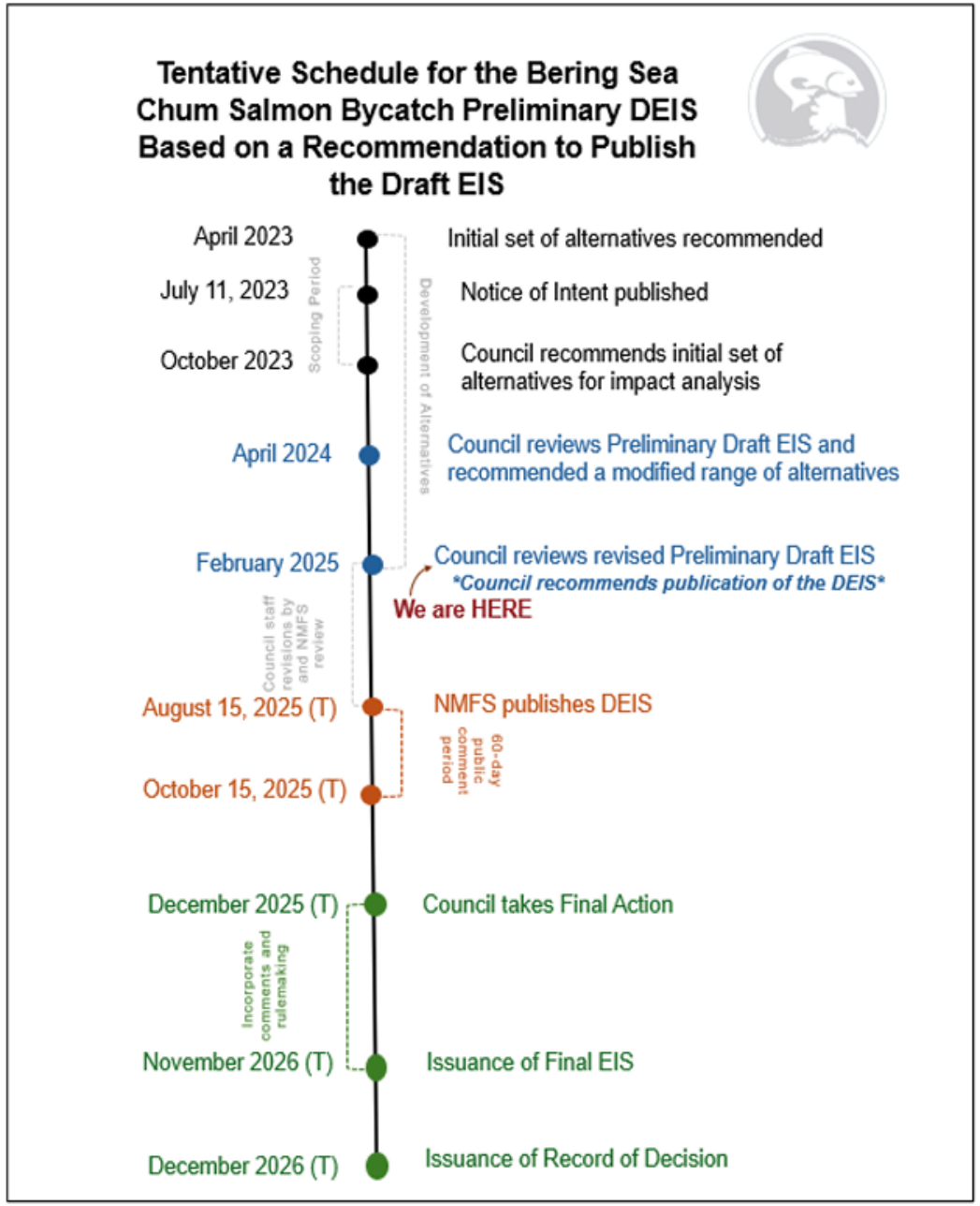


Figure 1. Tentative timeline for the Bering Sea chum salmon bycatch action if the Council recommends the DEIS be published at the February 2025 meeting.

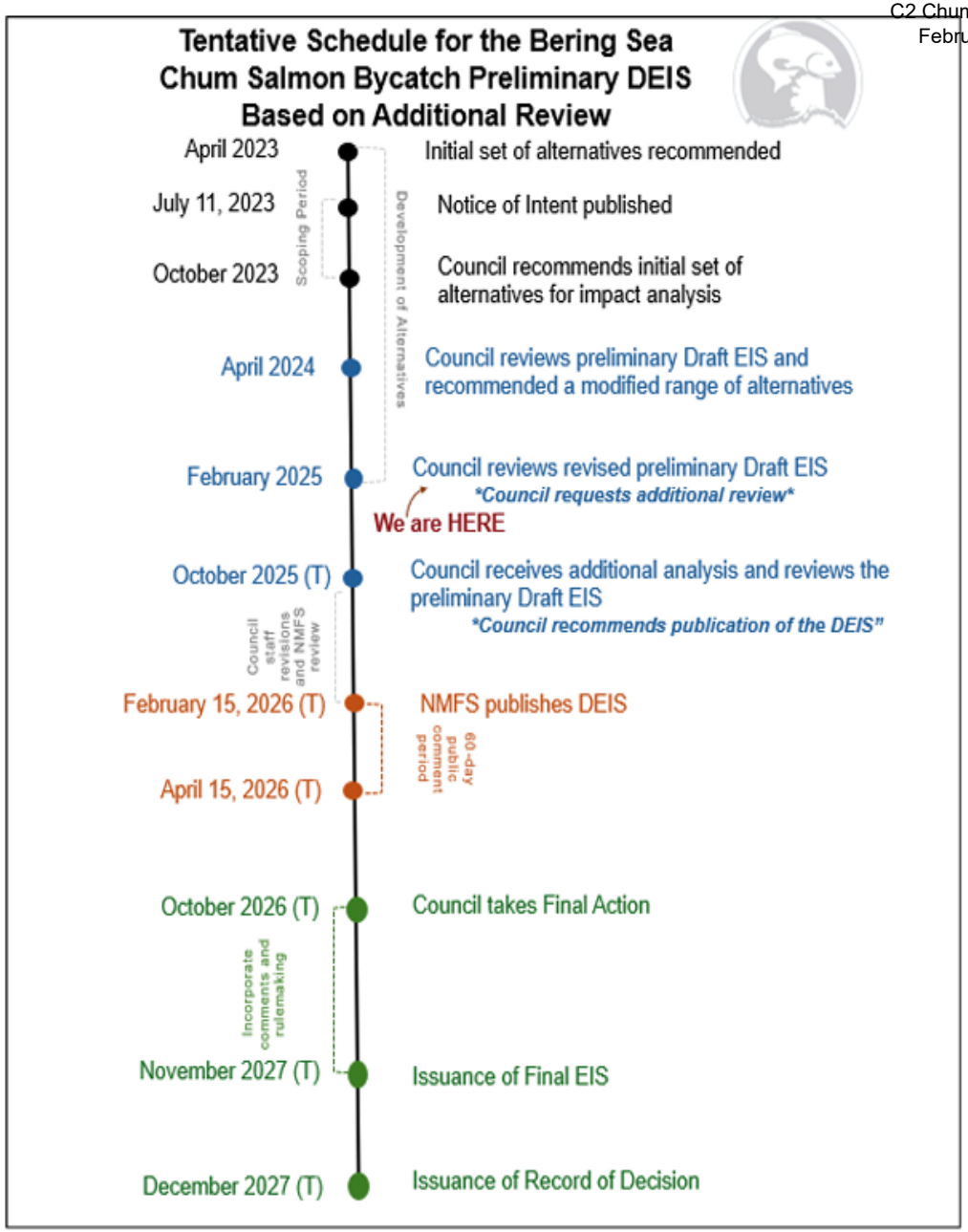
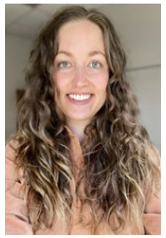


Figure 2. Tentative timeline for the Bering Sea chum salmon bycatch action if the Council requests additional review.

REMINDER Remaining Components of the C2 Agenda Item

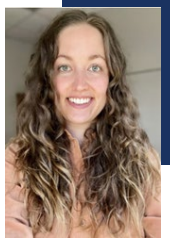
1. ~~Staff presentation on preliminary Draft Environmental Impact Statement~~
2. Tribal Consultation and Engagement Report
3. Kuskokwim River Inter-Tribal Fish Commission
4. Tanana Chiefs Conference
5. 2024 Bering Sea chum salmon bycatch genetics report
6. Public Testimony
7. AP Deliberations



Questions?

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

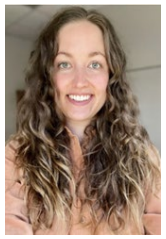
EXTRA SLIDES



Other Approaches to the Alternative 5 Impact Analysis

Section 3.2.4.4.1.3

1. Historical dependence on fishing grounds inside corridor
2. Spatial and temporal distribution of chum PSC, pollock catch, and WAK chum PSC
3. Years when caps would have been met, date, and the amount of pollock catch displaced
4. Regulatory, capacity, and environmental constraints



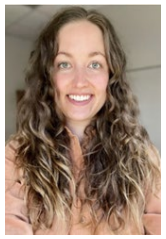
Pollock Sector's Dependence on Fishing Grounds Inside the Corridors

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

	Cluster 1			Unimak			Cluster 2		
Year	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.



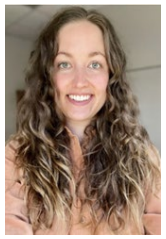
Comparing Chum Salmon PSC and Pollock Catch

Section 3.2.4.4.1.3

Table 3-38 Comparison of pollock catch (mt), chum salmon PSC (number of fish), and PSC rate during June and July, August, and September to November 1 in each corridor area, 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
Chum salmon PSC	2019	72,056	16,932	75,659	70,713	16,138	68,106	14,573	16,420	11,322
	2020	4,017	17,609	96,770	3,977	16,743	91,278	5,201	30,988	28,223
	2021	208,666	7,404	5,789	182,557	6,191	5,221	181,884	87,961	4,960
	2022	52,465	96,143	1,697	28,628	80,517	1,650	11,608	10,008	9,306
	2023	19,768	29,173	8,056	19,427	29,026	8,010	1,407	7,081	257
Chum salmon PSC Rate	2019	0.54	0.13	0.66	0.55	0.13	0.77	0.58	2.00	0.27
	2020	0.11	0.25	0.76	0.11	0.26	0.74	0.80	1.27	1.6
	2021	1.09	0.07	0.07	1.00	0.06	0.07	8.3	7.77	0.10
	2022	0.25	1.37	0.11	0.17	1.26	0.11	0.13	2.83	1.45
	2023	0.12	0.95	0.10	0.14	1.00	0.11	0.10	0.32	0.56

Source: NMFS Alaska Region CAS.



Pollock Catch Displaced

Section 3.2.4.4.1.3

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

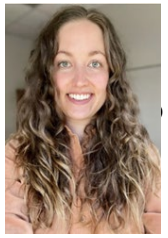
Cluster 2								
Limit	50,000				100,000			
Sector	CDQ	CP	M	CV	CDQ	CP	M	CV
Sector Apportionment 1, 3-yr avg								
2019								
2020								
2021		3,139	973	9,459		3,139	973	9,459
2022	5,236	3,366			5,236			
2023								
Sector Apportionment 2, 5-yr avg								
2019								
2020								
2021		3,139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

Factors Likely to Affect Movement Behavior

Section 3.2.4.4.1.3

- CPs, and motherships to a lesser degree, 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
- 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 of the “shelf edge”



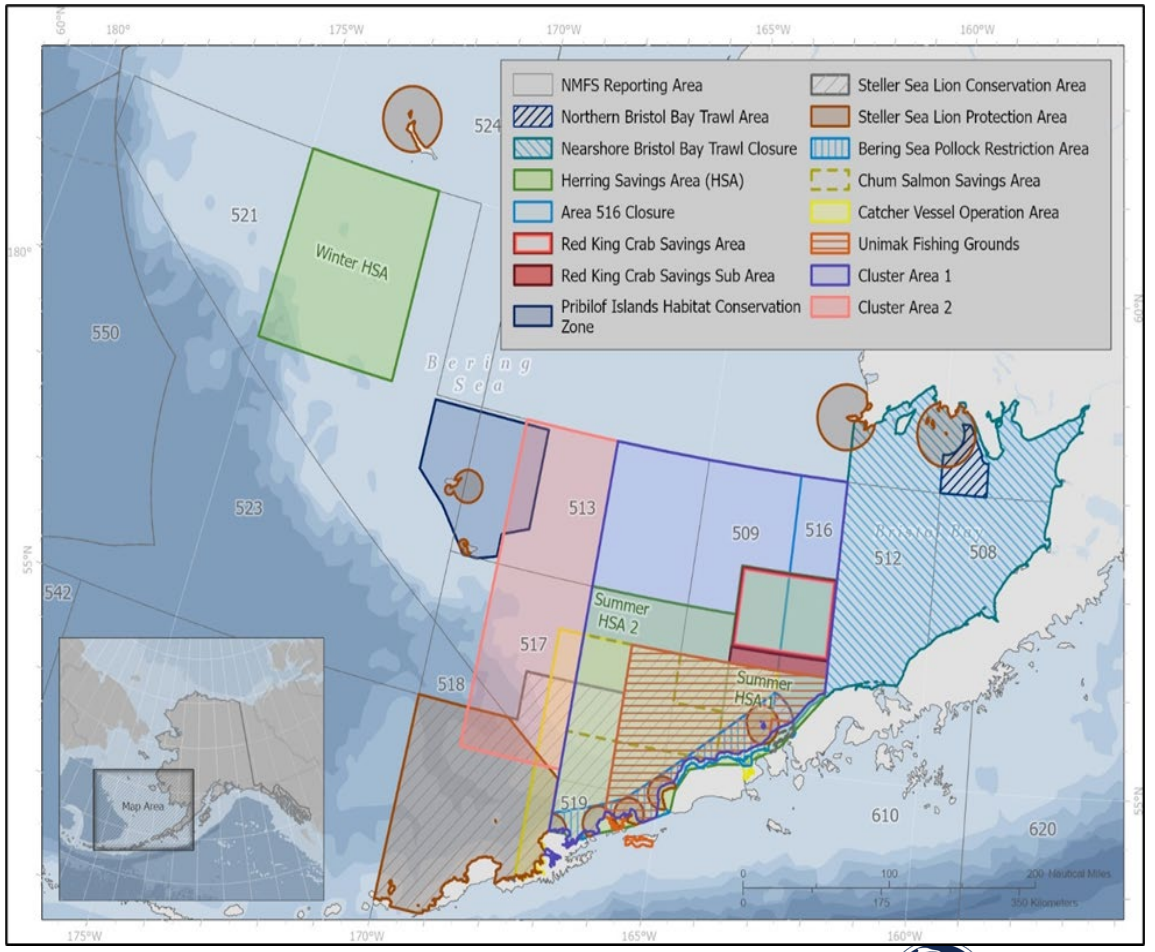


Figure 3-23 Inseason corridor areas under Alternative 5 and other relevant groundfish management area boundaries in the Bering Sea

Anticipated Responses/Movement Scenarios

Section 3.2.4.4.1.3

Corridor	Period	CP/CDQ	Mothership	Inshore
Cluster 1	**Pre closure**	Avoid area as able	• Mothership CVs may fish outside as able • Inshore cooperatives may also encourage larger CVs to fish outside as able • Both would execute very careful PSC accounting	
	Post closure	Move to Cluster 2 but more likely further northwest	• Motherships have variable fishing history but trend similar to inshore CVs • Greater flexibility to move • Given variability, movement influenced by conditions in that year	• Many may move to Cluster 2 with some larger vessels moving further northwest • Vessels would target areas available to them with known conditions (pollock aggregations and PSC)
Unimak	**Pre closure**	No CP pollock harvest, avoid area as able for CDQ	Same as Cluster 1	
	Post closure	Unlikely to be affected, move further northwest	Move to a portion of Cluster 1, then to Cluster 2 and further northwest as able	
Cluster 2	**Pre closure**	• All sectors/vessels would avoid due to the extent practicable because of historically high PSC rates • Careful PSC monitoring to not risk losing operational flexibilities provided by accessing fishing grounds		
	Post closure	Move further northwest	Move vessels into Cluster 1 or Unimak, some potentially further northwest