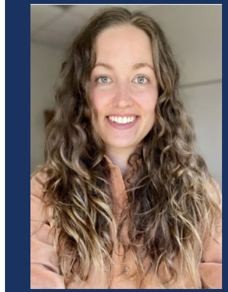
C4 Bering Sea Chum Salmon Bycatch

(Preliminary Review Analysis)

Scientific and Statistical Committee, October 2023



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

- Council's purpose and need statement (section 1.2, pg. 37-38)
  - Minimize chum salmon bycatch to the extent practicable in the Bering Sea pollock fishery
  - Priority is to minimize the bycatch of Western Alaska (WAK) origin chum salmon
    - Do so while maintaining the priority objective of the Chinook bycatch avoidance program

Year	***Bering Sea pollock fishery***	***All groundfish fisheries in the Bering Sea***	***Bering Sea pollock fishery as % of total***
2013	125,316	126,463	99.09%
2014	219,442	223,867	98.02%
2015	237,752	241,491	98.45%
2016	343,001	346,000	99.13%
2017	467,678	469,769	99.55%
2018	295,092	307,367	96.01%
2019	348,023	354,681	98.12%
2020	343,626	344,849	99.65%
2021	546,042	548,752	99.51%
2022	242,375	243,695	99.46%
Average	316,835	320,693	98.70%

Table ES 1 Comparison of the number of chum salmon caught as bycatch in the Bering Sea pollock fishery compared to all groundfish fisheries in the Bering Sea, 2013-2022, pg. 6

The Council is considering this action in light of recent Western Alaska chum salmon run declines

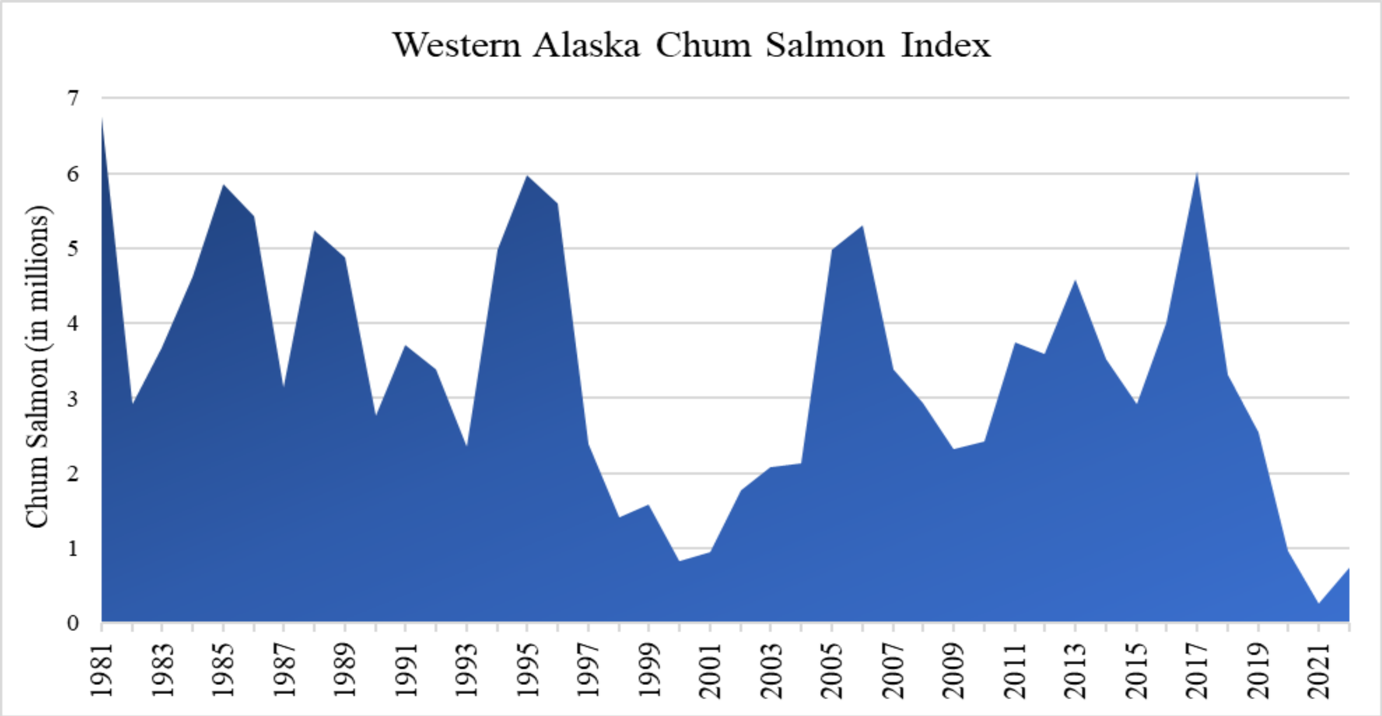


Figure A1 2 Chum salmon index of abundance estimates for Western Alaska stocks, pg. 105
Notes: Summed index of abundance for WAK chum salmon stocks where the abundance is consistently measure. Includes Yukon River summer and fall chum salmon, Kogrukluk River Weir, and Kwiniuk River information

Chum salmon bycatch is encountered in the Bering Sea in the B season (summer months) pollock fishery

Table 2-6 Annual total chum salmon bycatch (A and B pollock seasons) compared to the chum salmon bycatch in the B season Bering Sea pollock fishery, 2011 through 2022, pg. 48

Year	Annual Total	B season total	B season as % of total
2011	191,435	191,317	99.94%
2012	22,183	22,172	99.95%
2013	125,316	125,114	99.84%
2014	219,442	218,886	99.75%
2015	237,752	233,085	98.04%
2016	342,589	339,236	99.02%
2017	467,678	465,848	99.61%
2018	295,079	294,705	99.87%
2019	347,865	346,812	99.70%
2020	343,625	343,095	99.85%
2021	546,042	545,901	99.97%
2022	242,375	242,309	99.97%

The Council adopted four preliminary alternatives, section 1.2 pg. 39-40

1. Alternative 1 – status quo
2. Alternative 2 – Overall chum salmon PSC limit
   A. Option 1: limit based on historical bycatch numbers, apportioned among the fishing sectors and further apportioned among the inshore cooperatives and CDQ groups; pollock fishing would cease if reached
   B. Option 2: weighted step-down PSC limit triggered by a 3-area chum index linked to Western Alaska chum abundance/Amounts Reasonably Necessary for Subsistence/Escapement
3. Alternative 3 – PSC limit for Western Alaska chum salmon
   A. Option 1: same as option 1 of Alternative 2
   B. Option 2: same as option 2 of Alternative 2
4. Alternative 4 – Additional regulatory requirements for Incentive Plan Agreements (IPAs) to be managed by either NMFS or the IPAs
   A. Option 1: require a chum salmon reduction plan be in place in the B season to prioritize avoidance of WAK chum in genetic cluster area 1 and 2 when two triggers are met (an established bycatch rate and proportion of WAK to non WAK chum)
   B. Option 2: require IPAs to use the most refined genetics information available to further prioritize times and areas of high WAK chum proportions

Council timeline for the current Bering Sea chum salmon bycatch action

We are here

1 Salmon Bycatch Committee

- Initiated in June 2022
- Convened for three meetings
- Recommendations on concepts for alternatives finalized in March 2023

2 April 2023 Council meeting

- Received annual update on scientific and industry reports
- Council adopted Purpose and Need statement as well as preliminary set of alternatives

3 October 2023 Council meeting

- Council will review preliminary analysis on alternative feasibility
- Finalizes alternatives for analysis of potential impacts

4 Initial Review

- Council will review an initial analysis of the potential impacts resulting from proposed management alternatives and recommend a Preliminary Preferred Alternative

5 Final Action

- Council selects and recommends a Preferred Alternative

National Marine Fisheries Service begins rulemaking process

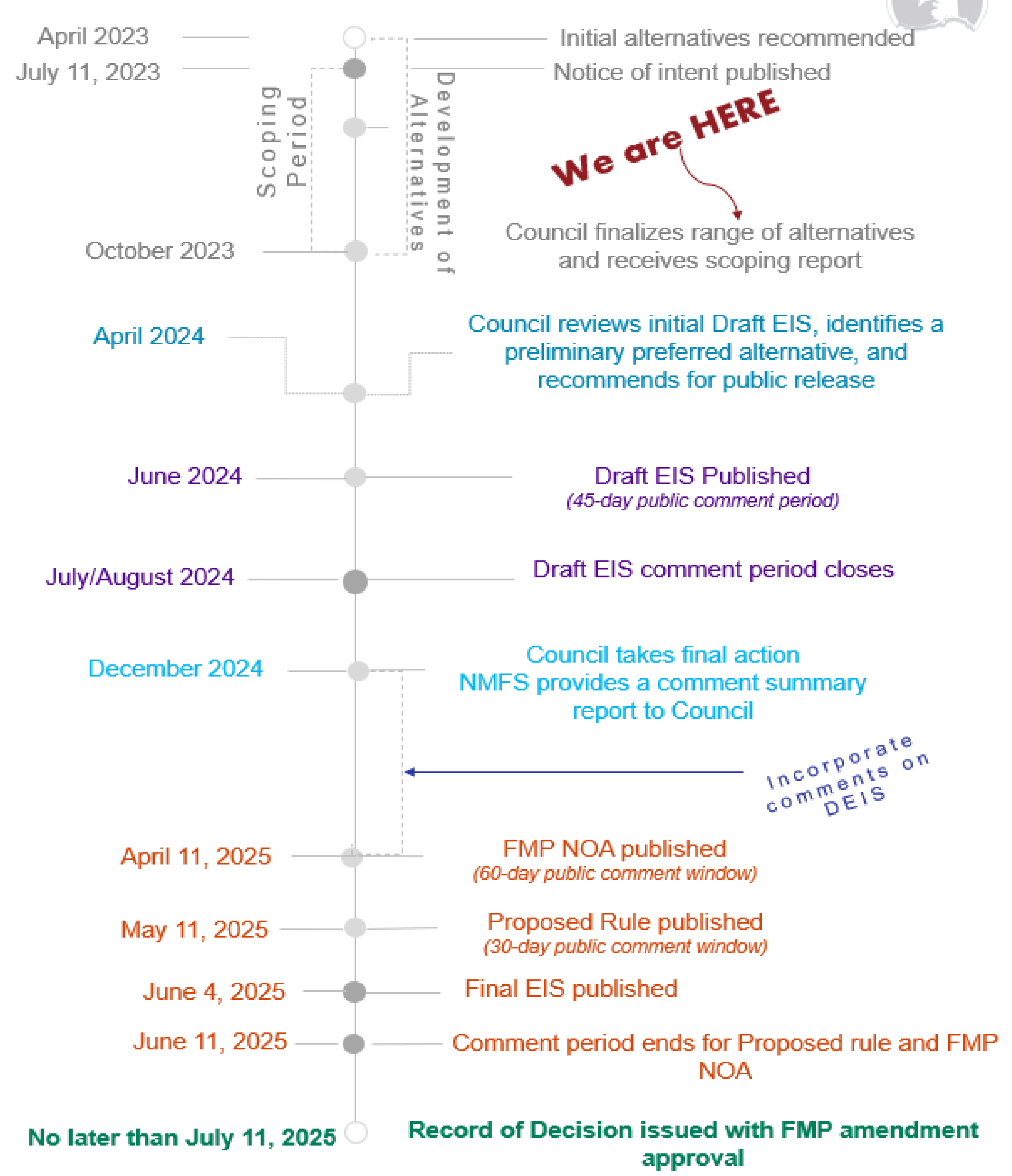
Why is the SCC receiving a presentation on the Preliminary Analysis?

- There are several policy choices before the Council at this meeting to finalize alternatives (see Table ES 6, pg. 34-35)
- The SSC may want to provide the Council guidance on certain technical elements of the alternatives as well as uncertainty
  - Measure of ocean temperature related to chum salmon bycatch levels
  - 3-river chum index linked to Western Alaska chum abundance/Amounts Reasonably Necessary for Subsistence/Escapement

NEPA procedural changes influencing this Environmental Impact Statement

- In June 2023, the National Marine Fisheries Service Alaska Region determined this action will require an Environmental Impact Statement (EIS) be prepared
  - The Notice of Intent to prepare an EIS for the Bering Sea chum salmon bycatch action was published on July 11, 2023
- The Fiscal Responsibility Act was signed on June 3, 2023
  - Effective immediately it constrains the overall timeline for preparing and completing an EIS to **two years** and **limits the EIS to 150 pages in length**
- Time clock starts with the publication of the Notice of Intent to prepare an EIS and ends with the Record of Decision

Potential Schedule for Draft EIS



MEASURE OF OCEAN TEMPERATURE

Chum salmon bycatch levels compared to ocean temperature (section 3.2.1.1)

- The Council asked for potential ranges of average chum bycatch levels from 2011 through 2022
- Policy choice before the Council is to determine whether management measures would be linked to ocean temperature
  - Uncertain what those management measures would be
- The SSC could weigh in on a measure of ocean temperature to use

Analytical approach - 1

- Sea surface and bottom temperature data were compared alongside chum salmon bycatch levels in the Bering Sea

Year	Chum salmon bycatch	Avg. Sea surface temp	Avg. Bottom temp
2011	191,317	5.19	2.31
2012	22,172	4.30	0.83
2013	125,114	4.93	1.64
2014	218,886	6.67	3.02
2015	233,085	6.36	3.13
2016	339,236	7.74	4.21
2017	465,848	6.18	3.14
2018	294,705	6.85	4.15
2019	346,812	7.63	4.73
2020	343,095	6.34	No survey
2021	545,901	6.01	3.54
2022	242,309	5.29	2.9
Average	280,706	6.12	3.05

Table 3-4 Number of chum salmon caught as B season bycatch, Bering Sea annual average sea surface temperature (degrees Celsius), and Bering Sea bottom temperature (degrees Celsius), 2011 through 2022, pg. 63

Analytical approach -2

Percentiles	***Sea surface temp (degrees Celsius)***	***Range of B season chum bycatch***	***Average level of chum bycatch***	***Years***
25%	5.26	22,172 - 191,317	112,868	2011, 2012, 2013
25-50%	5.26-6.30	242,309 - 545,901	418,019	2017, 2021, 2022
50-75%	6.30-6.71	218,886 - 343,095	265,022	2014, 2015, 2020
75-100%	6.71-7.74	294,705 - 346,812	326,918	2016, 2018, 2019

Table 3-5 Percentile ranges of annual average sea surface temperature (25th, 25-50th, 50-75th, and 75-100th) and the corresponding range of B season chum salmon bycatch, pg 64

Percentiles	***Bottom temp (degrees Celsius)***	***Range of B season chum bycatch***	***Average level of chum bycatch***	***Years***
25%	2.6	22,172 - 191,317	112,868	2011, 2012, 2013
25-50%	2.6-3.13	218,886 - 242,309	231,427	2014, 2015, 2022
50-75%	3.13-3.85	465,848 - 545,901	326,918	2017 and 2021
75-100%	3.85-4.73	294,705 - 346,812	326,917	2016, 2018, 2019

Table 3-6 Percentile ranges of annual average bottom temperature (25th, 25-50th, 50-75th, and 75-100th) and the corresponding range of B season chum salmon bycatch, pg 64

Sea surface temperature

- During the analyzed period, there does not appear to be a clear relationship between sea surface temperature and the level of B season chum salmon bycatch
- Chum salmon bycatch was lowest during the years with the lowest annual average sea surface temperature (2011-2013), but above 5.26ºC the relationship is variable

Year	Chum salmon bycatch	Annual average sea surface temperature
2012	22,172	4.30
2013	125,114	4.93
2011	191,317	5.19
2014	218,886	6.67
2015	233,085	6.36
2022	242,309	5.29
2018	294,705	6.85
2016	339,236	7.74
2020	343,095	6.34
2019	346,812	7.63
2017	465,848	6.18
2021	545,901	6.01

25th percentile

25-50th percentile

50-75th percentile

75-100th percentile

Figure 3-6 B season chum salmon bycatch in ascending order (low to high) compared to percentile ranges of annual average sea surface temperature (degrees Celsius), 2011-2022, pg 65

Bottom temperature

- In years with warmer bottom temperature, the level of chum salmon bycatch tends to be slightly higher
- This could be due to shifts in chum salmon distribution that result in greater overlap with the distribution of pollock

Year	Chum salmon bycatch	Annual Average bottom temperature
2012	22,172	0.83
2013	125,114	1.64
2011	191,317	2.31
2014	218,886	3.02
2015	233,085	3.13
2022	242,309	2.9
2018	294,705	4.15
2016	339,236	4.21
2019	346,812	4.73
2017	465,848	3.14
2021	545,901	3.54

25th percentile
25-50th percentile
50-75th percentile
75-100th percentile

Figure 3-8 B season chum salmon bycatch in ascending order (low to high) compared to percentile ranges of annual average bottom temperature (degrees Celsius), 2011 through 2022 except for 2020

Considerations

- Bottom temperature appears to be a better indicator of chum salmon bycatch levels year to year
- Mismatch in the timing of when bottom temperature data would be available from the survey (typically September) and the start of the B season pollock fishery which opens on June 10 each year
- For management purposes, the relationship between bottom temperature (as measured by the Bering Sea bottom trawl survey) and bycatch levels would need to be evaluated retroactively

ALTERNATIVE 2 OPTION 2 STEP-DOWN PSC LIMIT TRIGGERED BY THREE AREA CHUM INDEX

Three Area Chum Index

- 3 River Systems to be considered:
  - Yukon River
  - Kuskokwim River
  - Norton Sound
- Systems weighted to account for variance in stock sized across river systems and stock status linked to:
  - Overall abundance
  - Whether Amounts Reasonably Necessary for Subsistence (ANS) are met;
  - Whether escapement goals (EGs) are met

Staff to work with ADF&G to determine feasibility of this concept and suggestions on how best to weight systems

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Feasibility of concept

- Use of these areas is feasible **IF** the Council chooses to assess each area independently (i.e. not summed)
  - Limited run reconstructions for chum salmon rivers
  - Data for rivers differ (e.g., full run reconstruction, test fishery, weir counts, etc)
- Treat each area as an independent 'test' for low abundance
  - Provides some proportionality between systems as run sizes vary substantially

ABUNDANCE ESTIMATES BY RIVER SYSTEM

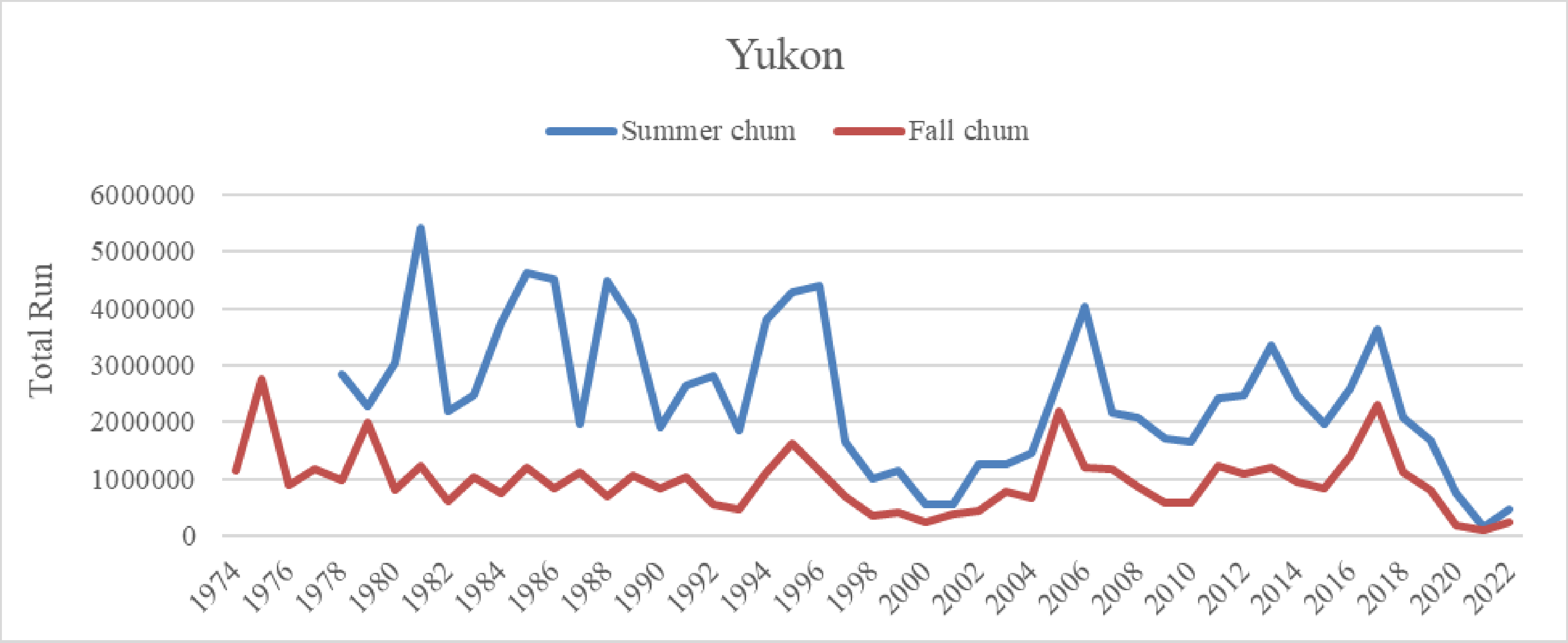
YUKON RIVER SUMMER AND FALL CHUM;

KUSKOKWIM RIVER;

NORTON SOUND AREA

YUKON RIVER

Recommendation to use full run reconstructions for both Summer and Fall chum



Total accounting of catch and escapement within the drainage area

Council decision points for Yukon River

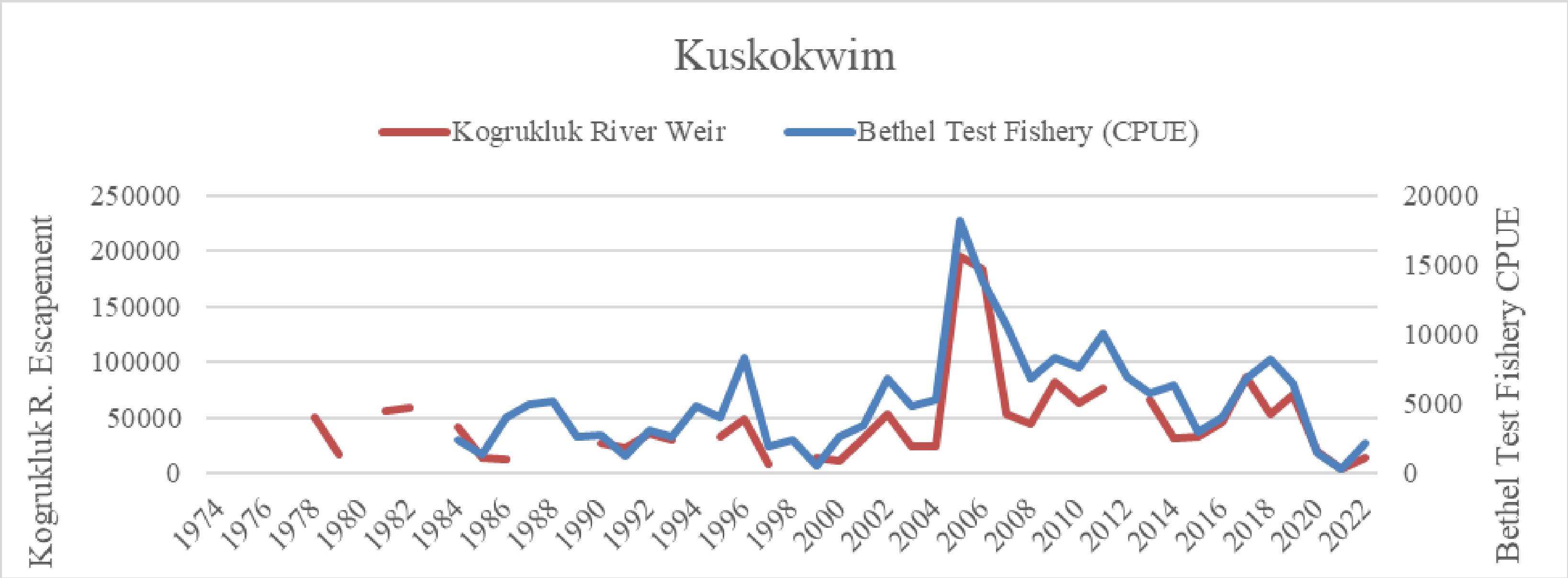
- Use of both Summer and Fall chum salmon stocks?
- Summer stocks → Coastal West Alaska (CWAK) and upper/middle Yukon genetic groups
- Fall stocks → only Upper/Middle Yukon
- Revised genetic baseline(more closely aligned to how assessed and managed):
  - will allow for all Summer stocks to be included in CWAK
  - Standalone Yukon River Fall chum grouping

Staff recommendation to use full run reconstructions for both Summer and Fall Yukon River chum stocks

Staff did not indicate whether these should be treated together or as independent tests

KUSKOKWIM RIVER

Recommendation to use annual CPUE data from Bethel test fishery



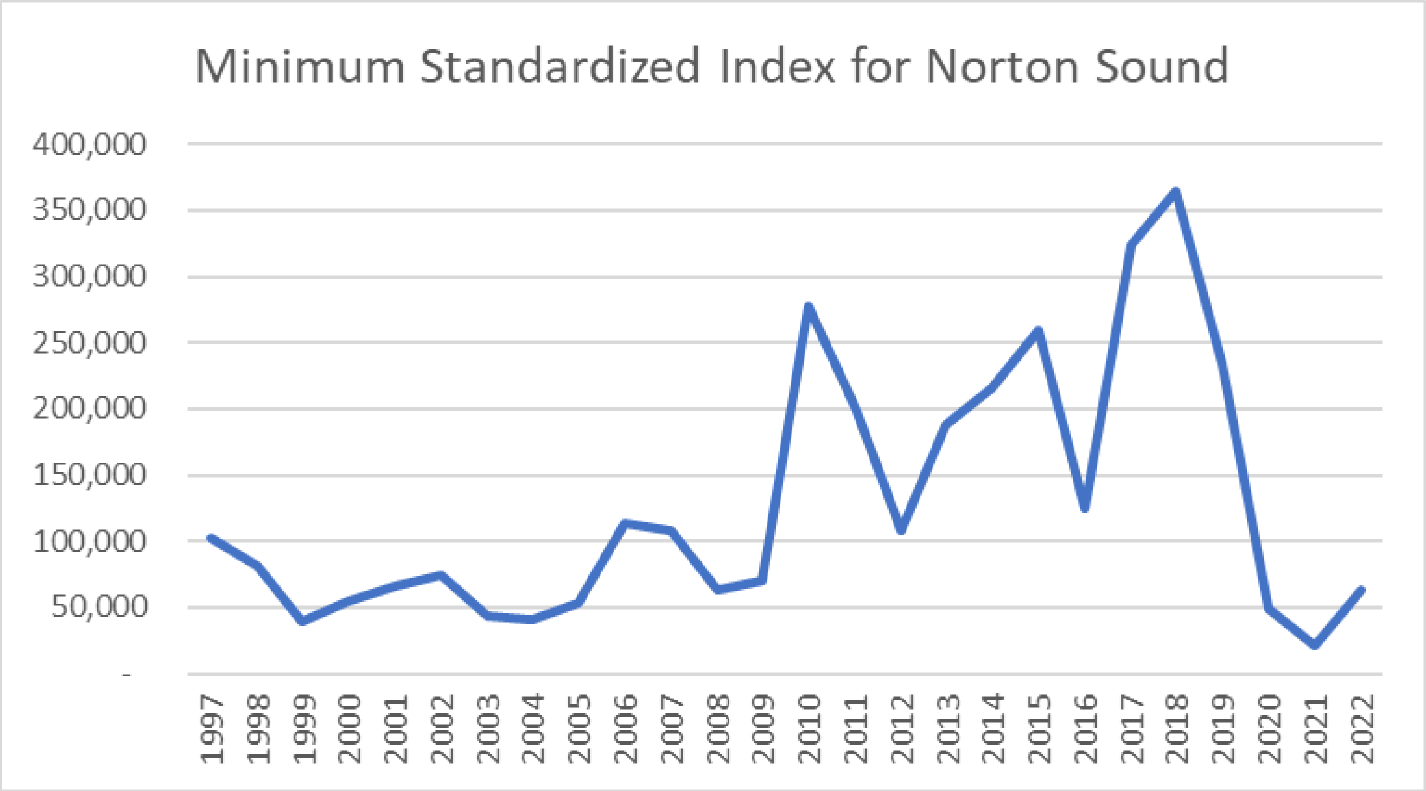
Why Bethel CPUE over other data sources for Kuskokwim?

- Only readily available information on total run abundance
- Less impacted by weather conditions compared to weir assessments
- Independently confirmed and used to provide a consistent indicator of relative run abundance
- Used by salmon managers
- Readily available to the public (public reports on ADF&G website)
- Timing will work with Council specifications process

NORTON SOUND

Recommendation to use a minimum standardized index for Norton Sound:

- Sum of escapements to Snake, Nome, Eldorado, Kwiniuk, North rivers (consistently enumerated through weir and tower counts)
- + Total Norton Sound Harvest



Why not just the Kwiniuk as an indicator for Norton Sound?

- Kwiniuk Run reconstruction data available through 2019 (produced through 2022 solely for Council analysis)
  - Run reconstruction is not used by ADF&G in management
- Only one of many runs in the Norton Sound region and may not be a reliable indicator for the whole system

Use of standardized index for Norton Sound

- More representative of chum salmon returns across several management subdistricts
- Include *preliminary* tributary escapements
  - Total estimated chum salmon passage at each assessment project
  - Ignores minimal harvest upriver of assessment locations
- Include *preliminary* commercial, sport, subsistence harvest data
  - Commercial fish tickets
  - ADF&G staff expectation of subsistence and sport harvest based upon historical trends, amounts of fishing opportunity provided and observations of fishery participation

Need to consider how to address missing data should data to inform index not be consistently available [note that in table 3-11 data are incomplete in recent years]

Three Area Chum Index

- 3 River Systems to be considered:
  - Yukon River
  - Kuskokwim River
  - Norton Sound

Determine criteria to define low abundance

- Systems weighted to account for variance in stock sized across river systems and stock status linked to:
  - Overall abundance
  - Whether Amounts Reasonably Necessary for Subsistence (ANS) are met;
  - Whether escapement goals (EGs) are met

Abundance by River System: Tables 3-8 through 3-11

- Years over which to define? Data availability varies for run sizes (and EGs and ANS) here we showed the most consistent (1992 and 1997-2002) but longer time series of run sizes are available:
  - Yukon Summer
    - 1978-2022
  - Yukon Fall
    - 1974-2022
  - Kuskokwim
    - 1984-2022 (Bethel CPUE)
  - Norton Sound
    - 1997-2022

Is it worth going back to earlier years and environmental regimes for some stocks?
Is it useful to look at run sizes without accompanying EGs and ANS?
What to do with consideration of 2023 value in analysis?

	2021 Goal Range			Initial	Escapement								
System	Lower	Upper	Type	Year	2013	2014	2015	2016	2017	2018	2019	2020	2021
CHUM SALMON													
Kuskokwim Area													
Middle Fork Goodnews River	12,000		LB SEG	2005	27,692	11,518	11,475	33,671	44,876	NS	38,072	NS	NS
Kogrukluk River	15,000	49,000	SEG	2005	65,648	30,697	33,091	45,234	85,793	52,937	71,006	19,020	4,153
Yukon River Summer Chum													
Yukon River Drainage[a]	500,000	1,200,000	BEG	2016				1,866,200	2,997,200	1,432,100	1,398,400	705,880	153,120
East Fork Andreafsky River	40,000		LB SEG	2010	61,234	37,793	48,809	50,362	55,532	36,330	49,881	NS	2,531
Anvik River	350,000	700,000	BEG	2005	571,690	399,796	374,968	337,821	415,139	305,098	249,014	NS	18,819
Yukon River Fall Chum													
Yukon River Drainage[a]	300,000	600,000	SEG	2010	854,000	741,000	541,000	832,000	1,706,000	654,000	528,000	194,000	94,525
Delta River	7,000	20,000	SEG	2019	32,000	32,000	33,000	22,000	49,000	40,000	52,000	9,900	1,613
Teedriinjik (Chandalar) River	85,000	234,000	SEG	2019	253,000	221,000	164,000	295,000	509,000	170,000	116,000	NS	21,162
Fishing Branch River (Canada)[b]	22,000	49,000	agreement	2008[c]	25,000	7,000	8,000	29,000	48,000	10,151	18,000	5,000	2,413
Yukon R. Mainstem (Canada)	70,000	104,000	agreement	2010[d]	200,000	156,000	109,000	145,000	401,000	154,000	98,000	23,500	23,170
Norton Sound													
Subdistrict 1 Aggregate	eliminated			2019	108,120	97,234	92,030	60,749	123,794	85,390			
Nome River	1,600	5,300	SEG	2019	4,807	5,589	6,100	7,085	6,321	5,240	3,164	2,822	216
Snake River	2,000	4,200	SEG	2019	2,755	3,982	4,241	3,651	4,759	3,028	2,374	842	2,352
Eldorado River	4,400	14,200	SEG	2019	26,131	27,038	25,549	18,938	73,882	42,361	28,427	11,333	6,283
Kwiniuk River	9,100	32,600	SEG	2019	5,625	39,597	37,663	8,523	32,541	41,620	18,029	4,953	3,862
Tubutulik River	3,100	9,000	SEG	2019	4,532	NS	9,835	NS	NS	NS	NS	NS	NS

2 (Kuskokwim Area)
3 (Yukon River Summer Chum)
5 (Yukon River Fall Chum) — All below in 2021
5 (Norton Sound)

ESCAPEMENT GOALS

ANS Table 3-12

- threshold for levels of harvest deemed reasonably necessary to support subsistence needs in a particular area
- BOF made positive ANS findings for all 3 areas under consideration

			chum salmon	Summer chum	Fall chum	All salmon
Norton Sound-Port Clarence Area		1998				96,000-160,000
	Subdistrict 1 of Norton Sound District*	1999	3,430-5,716			
Yukon Area		2001		83,500-142,192	89,500-167,900	
Kuskokwim Area		2013				
	Kuskokwim River		41,200-116,400			
	Districts 4 and 5					6,900-17,000
	Remainder of Area					12,500-14,400

ADDED INFORMATION:

AVERAGE RUN SIZE,

25-75%S

INFO ON EGS AND ANS MET (WHERE AVAILABLE)

TABLES 3-8 THROUGH 3-11 RESORTED ON RUN SIZE (ADDENDUM POSTED)

YUKON SUMMER CHUM

EGs drainage
Upper 1,200,000
Lower 500,000

75%	2,642,950
average	2,063,060
50%	1,974,300
25%	1,266,200

Year	Yukon Summer Index (run reconstruction)	Currently established ANS Met (83,500–142,192)	Met or Exceeded All Current EGs(Anvik, EF Andreafsky and Drainagewide; based on currently used EG range)
1995	4,295,000	YES	100%
1996	4,219,600	YES	100%
2006	4,012,700	YES	100%
1994	3,670,100	YES	100%
2017	3,627,300	YES	100%
2013	3,346,100	YES	100%
2005	2,760,000	YES	67%
1992	2,707,800	YES	100%
2016	2,578,100	YES	67%
2012	2,478,400	YES	100%
2014	2,463,900	YES	67%
2011	2,405,800	YES	100%
2007	2,154,700	YES	100%
2018	2,070,000	NO	33%
2008	2,065,100	YES	100%
2015	1,974,300	YES	100%
1993	1,786,500	YES	100%
2009	1,698,400	NO	33%
2019	1,682,200	NO	67%
2010	1,664,800	YES	100%
1997	1,654,200	YES	100%
2004	1,462,500	NO	100%
2002	1,273,400	YES	100%
2003	1,259,000	NO	33%
1999	1,142,800	YES	67%
1998	1,012,700	YES	100%
2020	762,520	NO	100%
2000	552,470	NO	0%
2001	541,970	NO	0%
2022	478,130	NO	0%
2021	154,370	NO	0%

YUKON FALL CHUM

EGs for drainage:
Upper 600,000
Lower 300,000

75%	1,150,608
average	893,713
50%	801,614
25%	450,752

Year	Yukon Fall Index (run reconstruction)	Currently established ANS Met (89,500–167,900)	Met or Exceeded All Current EGs(Drainagewide, Delta, Chandalar, Fishing Branch CA, Yukon Mainstem CA; based on currently used EG range)
2017	2,288,383	NO	100%
2005	2,180,488	YES	100%
1995	1,611,534	YES	100%
2016	1,389,062	NO	100%
2011	1,238,091	NO	80%
2013	1,211,909	YES	100%
2006	1,211,273	NO	100%
2007	1,160,101	YES	100%
1996	1,141,115	YES	100%
2018	1,112,834	NO	80%
1994	1,109,572	YES	100%
2012	1,085,700	YES	100%
2014	954,769	YES	80%
2008	857,269	NO	80%
2015	823,653	NO	80%
2019	801,614	NO	80%
2003	792,025	NO	100%
1997	707,279	YES	100%
2004	653,216	NO	80%
2009	598,277	NO	100%
2010	587,091	NO	80%
1992	568,652	YES	75%
1993	473,535	NO	75%
2002	427,969	NO	80%
1999	419,480	YES	40%
2001	374,885	NO	60%
1998	351,957	NO	40%
2000	252,942	NO	40%
2022	242,480	NO	0%
2020	184,233	NO	25%
2021	95,249	NO	0%

KUSKOKWIM RIVER CHUM

EGs based on Kogrukluk Not Bethel Test fishery CPUE

CPUE <2,300 typically fail to meet ANS and EGs

75%	7,275
average	5,715
50%	5,248
25%	2,772

Year	Bethel Test Fishery CPUE	Currently established ANS Met (41,200-116,400)	All Current Egs (Kogrukluk River; based on currently used
2005	18,192	YES	YES
2006	13,927	YES	YES
2007	10,655	YES	YES
2011	10,028	YES	YES
2009	8,257	YES	YES
1996	8,256	YES	YES
2018	8,205	YES	YES
2010	7,655	YES	YES
2012	6,894	YES	
2002	6,798	YES	YES
2017	6,785	YES	YES
2008	6,749	YES	YES
2019	6,429	NO	YES
2014	6,345	YES	YES
2013	5,739	YES	YES
2004	5,248	YES	YES
2003	4,819	YES	YES
1994	4,801	YES	
2016	3,998	YES	YES
1995	3,986	YES	YES
2001	3,396	YES	YES
1992	3,057	YES	YES
2015	2,945	NO	YES
2000	2,599	YES	NO
1993	2,586	YES	YES
1998	2,337	YES	
2022	2,191	NO	NO
1997	1,965	NO	NO
2020	1,443	NO	YES
1999	549	YES	NO
2021	327	NO	NO

NORTON SOUND AGGREGATE INDEX FOR CHUM

No aggregate EG, assessed individually

<70,000(index) frequently fail to meet EGs and often low subsistence

75%	198,842
average	128,481
50%	91,450
25%	57,029

ANS all salmon not just chum salmon

Year	Minimum Standardized Index (Sum of Snake, Nome, Eldorado, Kwiniuk, North rivers weir/tower escapement and Total NS Harvest)	Met or Exceeded Current EGs (Snake, Nome, Eldorado, Kwiniuk; based on currently used EG range - excludes Tubutulik because that system is rarely assessed)	Subdistricts 1-6 Subsistence Harvest
2018	363,939	100%	6,572
2017	324,148	100%	14,226
2010	277,401	100%	16,201
2015	259,441	100%	14,767
2019	234,270	100%	6,280
2014	215,382	100%	16,233
2011	202,421	100%	14,556
2013	188,104	75%	15,504
2016	124,397	75%	12,818
2006	113,350	100%	5,942
2007	107,719	100%	12,011
2012	107,359	50%	12,399
1997	101,934	100%	16,906
1998	80,966	100%	14,497
2002	73,710	100%	13,095
2009	69,906	25%	8,946
2001	66,123	75%	13,963
2008	63,806	75%	8,709
2022	62,657	100%	10,539
2000	55,153	75%	12,989
2005	53,034	100%	6,115
2020	49,762	50%	1,950
2003	43,407	75%	9,498
2004	41,270	75%	4,541
1999	39,217	0%	13,049
2021	21,632	50%	1663

Step-down provisions and How to weight or prioritize 3 areas?

- Council needs to indicate if all 3 regions are weighted equally or if some are a higher priority than others for indications of low abundance e.g.,
  - All 3 areas as assessed against benchmark for low abundance if all 3 are above threshold values then no PSC limit
  - If 2 out of 3 areas are above threshold than PSC limit = *[limit to be determined by Council]*
  - If 1 out of 3 areas is above threshold and below then PSC limit = *[lower limit to be determined by Council]*
  - If all 3 areas are below thresholds then PSC limit = *[more restrictive limit to be determined by Council]*
- If prioritization of one region over others is desirable then step down provisions would be implemented only if the specific area is at low abundance as specified by the Council

SSC considerations

- Are these 3 areas appropriate as candidate areas to assess low abundance across WAK and to be treated as independent tests?
- Over what range of years should low abundance by system be estimated and by what criteria?
- What to do in the event of missing or incomplete data by system in a given year?
- If the Council moves forward with consideration of any of the percentile metrics or averages to indicate low abundance should we include 2023 in out year sets as available?

Questions?

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