Kuskokwim River Salmon Management Working Group

1 (800) 315-6338 (MEET) Code: 58756# (KUSKO)

ADF&G Bethel toll free: 1 (855) 933-2433

Meeting Agenda

Date: **06/23/2021** **Time**: **10:00 a.m.–12:00 p.m.** Place: **ADF&G Office, Bethel, AK**

Time Called to Order: Chair:

ROLL CALL TO ESTABLISH QUORUM:

Upriver Elder:
Downriver Elder:
Commercial Fisher:
Lower River Subsistence:
Middle River Subsistence:
Upper River Subsistence:
Headwaters Subsistence:

QUORUM MET? Yes / No

Member at Large 1:
Member at Large 2:
Sport Fisher:
Western Interior RAC:
Y-K Delta RAC:
KRITFC:
ADF&G:

INTRODUCTIONS:
INVOCATION:
APPROVAL OF MINUTES: *Optional. ADF&G does not prepare official meeting minutes.*
APPROVAL OF AGENDA: *the agenda may be amended at this time.*
USFWS/KRITFC UPDATE:
ADF&G MANAGEMENT ACTIONS UNDER CONSIDERATION:
PEOPLE TO BE HEARD: *Non-Working Group Members*
CONTINUING BUSINESS:

- Subsistence Reports: Lowest River, ONC Inseason Subsistence Report, Lower River, Middle River, Upper River, Headwaters
- Inseason Harvest Report (ONC/KRITFC)
- Overview of Kuskokwim River salmon run assessment:
  a. Test Fisheries (Bethel and Aniak):
  b. Sonar/Weirs/Aerial Surveys/Other:
  c. Subsistence Division Project Update:
  d. NVN Report:
- Working Group KRITFC Representative Report:
- Commercial Catch Report: N/A
- Processor Report: N/A
- Sport Fish Report:
- Trawl Bycatch Report
- Donlin Gold
- Intercept Fishery Report: *optional*
- Weather Forecast:
- Discussion of ADF&G Management considerations and discussion of possible alternatives (recommendations from the Working Group):
- Motion for Discussion and Action:

OLD BUSINESS:
NEW BUSINESS:

COMMENTS FROM WORKING GROUP MEMBERS:

NEXT MEETING DATE:_____Time:_____Place:_____

Informational Packet

Information Packets *ARE*:

- **Intended to help inform Working Group discussions.**
- **To be viewed and used in context with Working Group meetings only.**

Packets *ARE NOT*:

- **To be viewed as standalone documents.**
- **A final say on fisheries management decisions.**

Please use this information responsibly:
Packet information is an incomplete snapshot of an ongoing discussion and changing conditions. Packet information should not be reproduced for any purpose other than to describe Working Group meeting discussions.

Misuse of Packet information can contribute to misunderstandings that can **cause harm to salmon users** and potentially **damage salmon resources**.

Ask Questions: ADF&G staff will be happy to answer biology and management questions. Please call **1-855-933-2433** to reach ADF&G Kuskokwim Area staff.

Attend Meetings: Each Working Group meeting is announced at least 48 hours prior to time and date of meeting. In addition, each meeting is recorded. Recordings can be found here: **http://www.adfg.alaska.gov/index.cfm?adfg=commercialbyareakuskokwim.kswg**

Viewing the information packet while listening to meetings/recordings will provide a better understanding of the information presented in this packet.

Thank you,
Nick Smith and Ben Gray
Working Group Coordinators

ONC
ORUTSARARMIUT NATIVE COUNCIL
ONC Fisheries 545-6001

Orutsararmiut Native Council (ONC) Inseason Harvest Monitoring Weekly Report

June 23, 2021

For the June 15 - 19, 2021 openers, ONC fisheries crew visited 36 Bethel area fish camps. On June 15, 26 fish camps were actively fishing and surveyed. ONC fisheries crew also gathered information from 134 fishing trips at the Bethel boat harbor with a combined total of 160 surveys conducted on June 15.

For the June 19, 2021 opener, ONC fisheries crew surveyed 31 fish camps who were actively fishing and gathered information from 125 fishing trips at the Bethel boat harbor. A combined total of 156 surveys were conducted on unique fishing trips.

Comments from the June 15th & 19th opener are as follows:

4 people said it was nice and they were happy to be out fishing. 25 people surveyed at the boat harbor and all fish camps want more openers, preferring them to be on weekends, every 3 days, and one wanted openers to start mid-June. One person suggested a longer opener to allow the people who cannot leave work early a chance to fish, a few people wanted the openers to follow the tides, and three fishers want the river open with no regulations. Another wanted 300 feet mesh to be allowed everywhere because the bigger kings are escaping from their net. 6 people noticed the amount of fish coming through the Kuskokwim is slower and in fewer quantities, one noticed the fish picking up, and multiple fishers commented upon the low return of Chum Salmon. One person wanted sport fishing to be open. 10 people are concerned about combat fishing and 5 are concerned about trawlers and want more genetic studies to be conducted. One fisher followed this comment stating that they want more studies to be done on where fish are being taken. Someone stated we've been in conservation mode for decades with no progress on the recovery of King Salmon and two stated they want the river closed until the salmon rebound. Another fisher had a comment about the barge schedule disrupting fishing and recommended shifting operating hours on openers. A fisher noticed that most of their Chinook catch had intestinal worms and that they were smaller in size. Another fisher commented that having opportunities early is good so people can have fish on their rack, restrictions make this difficult. Lastly, one fisher had concerns about the overuse of the resource, fishery collapse, and climate change. They also stated that they would like to see fish hatcheries on the river because of concern over trawler bycatch and want loopholes in the Magnuson Stevens Act filled in.

Table 1. Average fish harvest, net length, and mesh size range surveyed at the Bethel area fish camps and Bethel boat harbor from the June 15, 2021 fishing opportunity.

Data Source	Number of Surveys Conducted	Average Chinook Salmon Harvest	Average Chum Salmon Harvest	Average Sockeye Salmon Harvest	Average other harvest	Net Length Range (ft.)	Mesh Size Range (in.)
Bethel Boat Harbor	134	7.5	0.4	1.4	>0.1	60-300	4-6
Bethel Fish Camps	26	12.8	0.3	2.8	>0.1	60-300	5.5-6

*10 of the surveys collected at Bethel boat harbor were not used to produce harvest estimates because the fishing was done outside of the area used in the harvest estimates program (stratum O).

Table 2. Average fish harvest, net length and mesh size range reported by surveyed Bethel area fish camps and Bethel boat harbor from the June 19, 2021 fishing opportunity.

Data Source	Number of Surveys Conducted	Average Chinook Salmon Harvest	Average Chum Salmon Harvest	Average Sockeye Salmon Harvest	Average other harvest	Net Length Range (ft.)	Mesh Size Range (in.)
Bethel Boat Harbor	125	6.6	0.7	3.1	>0.5	60-300	4-6
Bethel Fish Camps	31	12.1	1.1	5.8	>0.5	60-300	5.375-6

*6 of the surveys collected at Bethel boat harbor were not used to produce harvest estimates because the fishing was done outside of the area used in the harvest estimates program (stratum O).

Table 3. Average fish harvest reported by surveyed Bethel area fish camps and Bethel boat harbor from mid-June fishing opportunities in 2020, 2019, and 2018

Year	Fishing Date	Data Source	Number of Surveys Conducted	Average King Salmon Harvest	Average Chum Salmon Harvest	Average Sockeye Salmon Harvest	Average other harvest
2020	6/19	Boat Harbor	92	7	1.5	1.6	<1
		Bethel Fish Camps	33	12.9	3.2	3.4	~1
2019	6/18	Boat Harbor	93	11.4	1.4	2.7	<1
		Bethel Fish Camps	40	19.4	~3	5.7	<1
2018	6/16	Boat Harbor	90	4.8	2.7	<1	<1
		Bethel Fish Camps	24	11.3	4.0	1	<1

Table 4. Fishing progress data from Bethel area fish camps from 6/15 and 6/19 visits.

Progress	Not at all	Under half	Halfway	Over Half	Goal Met
King Salmon	24.39%	17.07%	24.39%	24.39%	7.32%
Chum Salmon	78.05%	14.63%	0.00%	0.00%	2.44%
Sockeye Salmon	65.85%	21.95%	2.44%	7.32%	0.00%

Fish Distribution

From June 15, 2021 through the morning of June 21, 2021, ONC delivered 53 Chinook salmon, 2 Chum salmon, 26 Red salmon, and 2 Sheefish to Bethel area and Tuluksak Elders. These fish were caught by the Alaska Department of Fish & Game Bethel Test Fishery.

Kuskokwim River In-season Harvest and Effort Estimates

6/15/2021 Subsistence Harvest Opportunity (Drift & Set Nets)

Opportunity Time Period: 6:00 AM – 6:00 PM (12 Hours)

Area Covered by Estimates: Tuntutuliak ⟷ Akiak

Contact Person(s): Kevin Whitworth (kevinwhitworth@kritfc.org), Katie Russell (krussell@nativecouncil.org)

Special Action #: 3-KS-01-21

Special Action: https://fws.gov/uploadedFiles/3-KS-01-21_Final_5.7.2021.pdf

Data Sources

TABLE 1. The number and percent of fisher interviews conducted by location and organization.

Data Source	Interviews	Percent
Bethel Boat Harbor (ONC)	124	53%
Other Villages (BSFA/KRITFC)	85	36%
Bethel Area Fish Camps (ONC)	26	11%
Total	**235**	**100%**

Of these interviews, **229** were from drift nets and **6** were from set nets.

TABLE 2. The time each flight was conducted and fishers counted each flight.

Time Information			Nets Counted	
Start Time	End Time	Hours	Drift	Set
9:20 AM	10:43 AM	1.38	360	26
3:10 PM	4:34 PM	1.40	327	29

Effort Estimates

- An estimated **467** total drift boat trips occurred.
  - An estimated **73%** of the trips counted on flight 2 were also counted on flight 1.
  - An estimated **18** trips were not counted during any flight.
- An estimated **31** total set net trips occurred.

Harvest Estimates

- An estimated total of **8,540 (7,470 – 9,550)** salmon were harvested.
  - An estimated total of **6,780 (5,940 – 7,630)** Chinook salmon were harvested.
  - An estimated total of **350 (260 – 470)** chum salmon were harvested.
  - An estimated total of **1,400 (1,130 – 1,700)** sockeye salmon were harvested.
- Harvest by set nets accounted for an estimated **530 (230 – 860)** total salmon (85% Chinook salmon, 6% chum salmon, and 9% sockeye salmon).

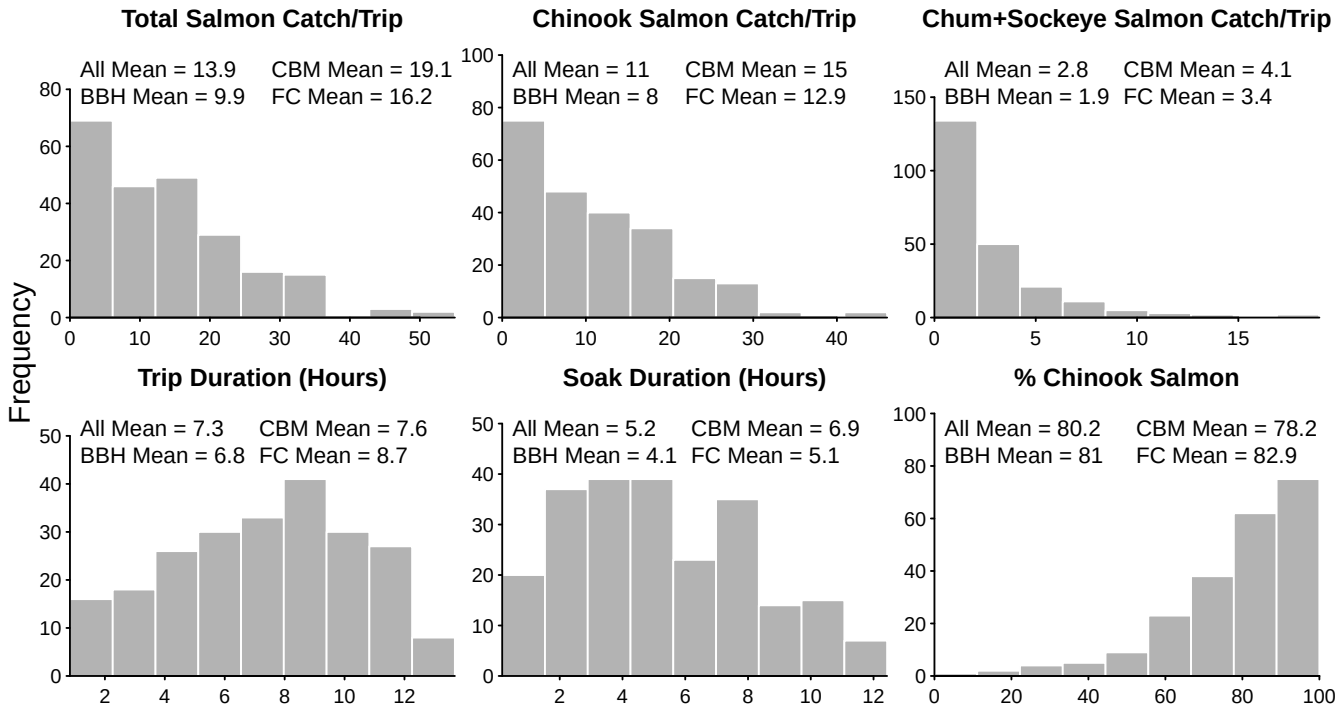
TABLE 3. Summary of relevant quantities by river stratum (area) for drift nets. Numbers in parentheses are 95% confidence intervals.

Stratum	Interviews	Effort Est.	Estimated Harvest			
			Chinook	Chum	Sockeye	Total
Tuntutuliak ⟷ Johnson R.	24	117	2,200 (1,600 – 2,820)	120 (50 – 210)	600 (380 – 850)	**2,920 (2,140 – 3,700)**
Johnson R. ⟷ Napaskiak	65	105	1,910 (1,550 – 2,280)	90 (60 – 130)	320 (220 – 440)	**2,320 (1,890 – 2,780)**
Napaskiak ⟷ Akiachak	139	205	1,860 (1,580 – 2,150)	100 (60 – 150)	360 (270 – 450)	**2,310 (2,000 – 2,640)**
Akiachak ⟷ Akiak	1	40	370 (310 – 420)	20 (10 – 30)	70 (50 – 90)	**450 (400 – 520)**
All	**229**	**467**	**6,330 (5,550 – 7,110)**	**330 (240 – 440)**	**1,340 (1,070 – 1,650)**	**8,010 (7,020 – 8,980)**

TABLE 4. Average (95% confidence limits) total salmon catch per trip and percent Chinook salmon, summarized for the areas above and below the confluence of the Johnson River with the Kuskokwim River. Quantities are derived from the strata- and species-specific harvest estimates, not the raw interview data.

Quantity	Proximity to Johnson R. Mouth	
	Downstream	Upstream
Total Catch/Trip	25 (18 – 32)	15 (13 – 16)
% Chinook Salmon	75% (69% – 82%)	81% (79% – 83%)

FIGURE 1. Distributions of relevant quantities from all completed trips using drift nets. The mean quantity by primary data source is shown in the top right; BBH = Bethel Boat Harbor (ONC), CBM = Other Villages (BSFA/KRITFC), FC = Bethel Area Fish Camps (ONC).



Appendix: Detailed Interview Summaries

Column Meanings

- **Area**: the area of the river the trip occurred in
- **N**: the number of interviews with usable information in each area
- **Min**: the minimum value among trips in each area
- **25%**: the value that 25% of trips fell below in each area
- **Mean**: the average value across trips in each area
- **75%**: the value that 75% of trips fell below in each area
- **Max**: the maximum value among trips in each area

Information is for drift net trips only.

TABLE A1. Summary of drift net catch rate of Chinook salmon by fishing area (salmon per 150 feet of net per hour).

Area	N	Min	25%	Mean	75%	Max
Tuntutuliak ⟷ Johnson R.	24	0	1.3	2.5	3	9.9
Johnson R. ⟷ Napaskiak	64	0	1.7	3.5	4.7	13.8
Napaskiak ⟷ Akiachak	138	0	0.8	2	2.8	6.8
Akiachak ⟷ Akiak	1	1.2	1.2	1.2	1.2	1.2
All	**227**	**0**	**1**	**2.5**	**3**	**13.8**

TABLE A2. Summary of drift net catch per trip of Chinook salmon by fishing area.

Area	N	Min	25%	Mean	75%	Max
Tuntutuliak ⟷ Johnson R.	24	0	9	16	23	46
Johnson R. ⟷ Napaskiak	65	0	7	15	20	45
Napaskiak ⟷ Akiachak	139	0	3	8	13	32
Akiachak ⟷ Akiak	1	12	12	12	12	12
All	**229**	**0**	**4**	**11**	**16**	**46**

TABLE A3. Summary of drift net catch rate of chum+sockeye salmon by fishing area (salmon per 150 feet of net per hour).

Area	N	Min	25%	Mean	75%	Max
Tuntutuliak ⟷ Johnson R.	24	0	0.4	0.8	1.3	2.2
Johnson R. ⟷ Napaskiak	64	0	0.3	0.8	1	5
Napaskiak ⟷ Akiachak	138	0	0	0.5	0.7	4.3
Akiachak ⟷ Akiak	1	0.1	0.1	0.1	0.1	0.1
All	**227**	**0**	**0.1**	**0.6**	**0.8**	**5**

TABLE A4. Summary of drift net catch per trip of chum+sockeye salmon by fishing area.

Area	N	Min	25%	Mean	75%	Max
Tuntutuliak ⟷ Johnson R.	24	0	2	6	9	19
Johnson R. ⟷ Napaskiak	65	0	1	4	5	17
Napaskiak ⟷ Akiachak	139	0	0	2	3	16
Akiachak ⟷ Akiak	1	1	1	1	1	1
All	**229**	**0**	**1**	**3**	**4**	**19**

TABLE A5. Summary of drift net percent composition of Chinook salmon by fishing area.

Area	N	Min	25%	Mean	75%	Max
Tuntutuliak ⟷ Johnson R.	24	42%	64%	75%	87%	100%
Johnson R. ⟷ Napaskiak	65	43%	73%	82%	90%	100%
Napaskiak ⟷ Akiachak	139	0%	73%	80%	94%	100%
Akiachak ⟷ Akiak	1	92%	92%	92%	92%	92%
All	**229**	**0%**	**71%**	**80%**	**93%**	**100%**

TABLE A6. Summary of drift net active fishing hours by fishing area.

Area	N	Min	25%	Mean	75%	Max
Tuntutuliak ⟷ Johnson R.	24	1.2	3.2	5.1	6.4	10.5
Johnson R. ⟷ Napaskiak	64	0.5	3.8	5.8	8	11.5
Napaskiak ⟷ Akiachak	138	0.2	2.5	4.9	7	12.4
Akiachak ⟷ Akiak	1	10	10	10	10	10
All	**227**	**0.2**	**2.8**	**5.2**	**7**	**12.4**

TABLE A7. Summary of drift net total trip duration by fishing area.

Area	N	Min	25%	Mean	75%	Max
Tuntutuliak ⟷ Johnson R.	24	4.5	5.9	8.1	9.2	13.7
Johnson R. ⟷ Napaskiak	65	1.2	5.5	7.5	10	12.3
Napaskiak ⟷ Akiachak	139	0.8	4.6	7.1	9.8	12.7
Akiachak ⟷ Akiak	1	10.3	10.3	10.3	10.3	10.3
All	**229**	**0.8**	**5**	**7.3**	**9.9**	**13.7**

TABLE A8. Summary of drift net trip start time by fishing area.

Area	N	Min	25%	Mean	75%	Max
Tuntutuliak ⟷ Johnson R.	24	5:15 AM	5:52 AM	8:11 AM	10:03 AM	1:00 PM
Johnson R. ⟷ Napaskiak	65	5:30 AM	6:00 AM	8:06 AM	9:00 AM	5:00 PM
Napaskiak ⟷ Akiachak	139	5:00 AM	6:00 AM	8:22 AM	10:15 AM	5:00 PM
Akiachak ⟷ Akiak	1	7:00 AM	7:00 AM	7:00 AM	7:00 AM	7:00 AM
All	**229**	**5:00 AM**	**6:00 AM**	**8:16 AM**	**10:00 AM**	**5:00 PM**

TABLE A9. Summary of drift net trip end time by fishing area.

Area	N	Min	25%	Mean	75%	Max
Tuntutuliak ⟷ Johnson R.	24	12:00 PM	2:55 PM	4:16 PM	5:45 PM	6:56 PM
Johnson R. ⟷ Napaskiak	65	9:22 AM	2:00 PM	3:38 PM	5:30 PM	7:15 PM
Napaskiak ⟷ Akiachak	139	8:00 AM	1:25 PM	3:26 PM	5:48 PM	7:30 PM
Akiachak ⟷ Akiak	1	5:17 PM	5:17 PM	5:17 PM	5:17 PM	5:17 PM
All	**229**	**8:00 AM**	**2:00 PM**	**3:35 PM**	**5:45 PM**	**7:30 PM**

Kuskokwim River In-season Harvest and Effort Estimates

6/19/2021 Subsistence Harvest Opportunity (Drift & Set Nets)

Opportunity Time Period: 6:00 AM – 6:00 PM (12 Hours)

Area Covered by Estimates: Tuntutuliak ⟷ Akiak

Contact Person(s): Kevin Whitworth (kevinwhitworth@kritfc.org), Katie Russell (krussell@nativecouncil.org)

Special Action #: 3-KS-02-21

Special Action: https://www.fws.gov/uploadedFiles/2021_fisheries_3-KS-02-21_Final_6.17.2021.pdf

Data Sources

TABLE 1. The number and percent of fisher interviews conducted by location and organization.

Data Source	Interviews	Percent
Bethel Boat Harbor (ONC)	119	50%
Other Villages (BSFA/KRITFC)	88	37%
Bethel Area Fish Camps (ONC)	30	13%
Total	**237**	**100%**

Of these interviews, **226** were from drift nets and **11** were from set nets.

TABLE 2. The time each flight was conducted and fishers counted each flight.

Time Information			Nets Counted	
Start Time	End Time	Hours	Drift	Set
9:34 AM	11:00 AM	1.43	437	12
3:13 PM	4:32 PM	1.32	271	28

Effort Estimates

- An estimated **511** total drift boat trips occurred.
  - An estimated **80%** of the trips counted on flight 2 were also counted on flight 1.
  - An estimated **20** trips were not counted during any flight.
- An estimated **31** total set net trips occurred.

Harvest Estimates

- An estimated total of **9,580 (8,400 – 10,920)** salmon were harvested.
  - An estimated total of **6,190 (5,330 – 7,140)** Chinook salmon were harvested.
  - An estimated total of **990 (670 – 1,400)** chum salmon were harvested.
  - An estimated total of **2,400 (2,080 – 2,740)** sockeye salmon were harvested.
- Harvest by set nets accounted for an estimated **630 (350 – 940)** total salmon (62% Chinook salmon, 11% chum salmon, and 27% sockeye salmon).

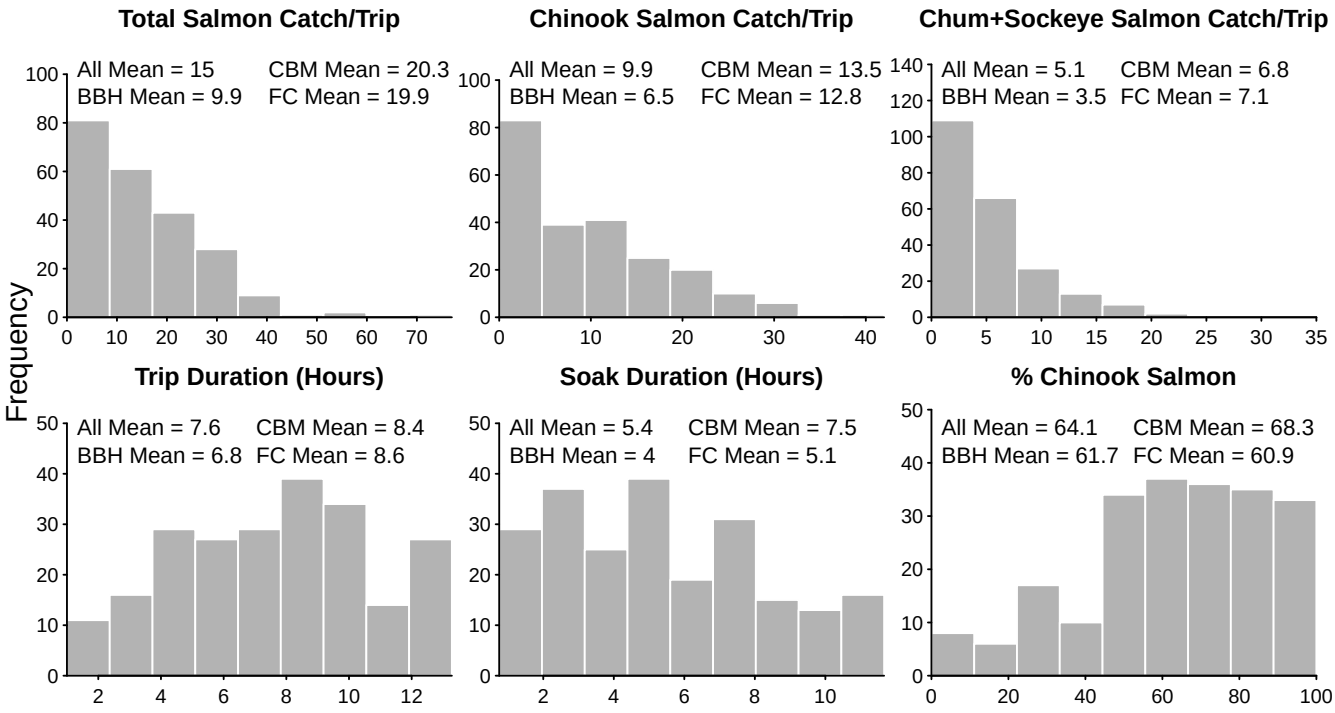
TABLE 3. Summary of relevant quantities by river stratum (area) for drift nets. Numbers in parentheses are 95% confidence intervals.

Stratum	Interviews	Effort Est.	Estimated Harvest			
			Chinook	Chum	Sockeye	Total
Tuntutuliak ⟷ Johnson R.	46	150	2,000 (1,360 – 2,790)	510 (230 – 900)	720 (490 – 970)	**3,230 (2,290 – 4,350)**
Johnson R. ⟷ Napaskiak	69	104	1,330 (1,060 – 1,640)	200 (150 – 270)	480 (370 – 580)	**2,010 (1,650 – 2,380)**
Napaskiak ⟷ Akiachak	111	212	2,040 (1,650 – 2,480)	180 (60 – 350)	860 (670 – 1,070)	**3,070 (2,500 – 3,650)**
Akiachak ⟷ Akiak	0	45	430 (340 – 520)	40 (20 – 70)	180 (140 – 220)	**650 (530 – 770)**
All	**226**	**511**	**5,810 (4,970 – 6,740)**	**920 (610 – 1,330)**	**2,230 (1,910 – 2,570)**	**8,950 (7,830 – 10,230)**

TABLE 4. Average (95% confidence limits) total salmon catch per trip and percent Chinook salmon, summarized for the areas above and below the confluence of the Johnson River with the Kuskokwim River. Quantities are derived from the strata- and species-specific harvest estimates, not the raw interview data.

Quantity	Proximity to Johnson R. Mouth	
	Downstream	Upstream
Total Catch/Trip	22 (15 – 29)	16 (14 – 18)
% Chinook Salmon	62% (55% – 68%)	66% (63% – 69%)

FIGURE 1. Distributions of relevant quantities from all completed trips using drift nets. The mean quantity by primary data source is shown in the top right; BBH = Bethel Boat Harbor (ONC), CBM = Other Villages (BSFA/KRITFC), FC = Bethel Area Fish Camps (ONC).



Appendix: Detailed Interview Summaries

Column Meanings

- **Area**: the area of the river the trip occurred in
- **N**: the number of interviews with usable information in each area
- **Min**: the minimum value among trips in each area
- **25%**: the value that 25% of trips fell below in each area
- **Mean**: the average value across trips in each area
- **75%**: the value that 75% of trips fell below in each area
- **Max**: the maximum value among trips in each area

Information is for drift net trips only.

TABLE A1. Summary of drift net catch rate of Chinook salmon by fishing area (salmon per 150 feet of net per hour).

Area	N	Min	25%	Mean	75%	Max
Tuntutuliak ⟷ Johnson R.	46	0	0.3	1.1	1.4	9.6
Johnson R. ⟷ Napaskiak	69	0	0.9	2.2	2.8	9.8
Napaskiak ⟷ Akiachak	111	0	0.7	2.2	2.9	14.5
All	**226**	**0**	**0.6**	**2**	**2.6**	**14.5**

TABLE A2. Summary of drift net catch per trip of Chinook salmon by fishing area.

Area	N	Min	25%	Mean	75%	Max
Tuntutuliak ⟷ Johnson R.	46	0	4	10	13	42
Johnson R. ⟷ Napaskiak	69	0	4	11	17	31
Napaskiak ⟷ Akiachak	111	0	2	9	14	32
All	**226**	**0**	**3**	**10**	**15**	**42**

TABLE A3. Summary of drift net catch rate of chum+sockeye salmon by fishing area (salmon per 150 feet of net per hour).

Area	N	Min	25%	Mean	75%	Max
Tuntutuliak ⟷ Johnson R.	46	0	0.2	0.7	0.8	4.8
Johnson R. ⟷ Napaskiak	69	0	0.3	1.1	1.7	3.6
Napaskiak ⟷ Akiachak	111	0	0.3	1.1	1.4	8.4
All	**226**	**0**	**0.3**	**1**	**1.4**	**8.4**

TABLE A4. Summary of drift net catch per trip of chum+sockeye salmon by fishing area.

Area	N	Min	25%	Mean	75%	Max
Tuntutuliak ⟷ Johnson R.	46	0	2	6	7	35
Johnson R. ⟷ Napaskiak	69	0	2	5	8	16
Napaskiak ⟷ Akiachak	111	0	1	5	6	31
All	**226**	**0**	**2**	**5**	**7**	**35**

TABLE A5. Summary of drift net percent composition of Chinook salmon by fishing area.

Area	N	Min	25%	Mean	75%	Max
Tuntutuliak ⟷ Johnson R.	46	0%	50%	60%	77%	100%
Johnson R. ⟷ Napaskiak	69	0%	55%	66%	82%	100%
Napaskiak ⟷ Akiachak	111	0%	50%	65%	83%	100%
All	**226**	**0%**	**50%**	**64%**	**81%**	**100%**

TABLE A6. Summary of drift net active fishing hours by fishing area.

Area	N	Min	25%	Mean	75%	Max
Tuntutuliak ⟷ Johnson R.	45	0.8	3.8	6.5	10	11.2
Johnson R. ⟷ Napaskiak	69	1	3.5	6.1	8.5	11.5
Napaskiak ⟷ Akiachak	110	0.8	3	4.5	6	11.7
All	**224**	**0.8**	**3**	**5.4**	**7.5**	**11.7**

TABLE A7. Summary of drift net total trip duration by fishing area.

Area	N	Min	25%	Mean	75%	Max
Tuntutuliak ⟷ Johnson R.	46	1.5	6.3	8.7	10.9	12.8
Johnson R. ⟷ Napaskiak	69	1.9	5.5	7.8	9.5	12.9
Napaskiak ⟷ Akiachak	111	1	4.3	7	9.4	13.3
All	**226**	**1**	**5.2**	**7.6**	**10**	**13.3**

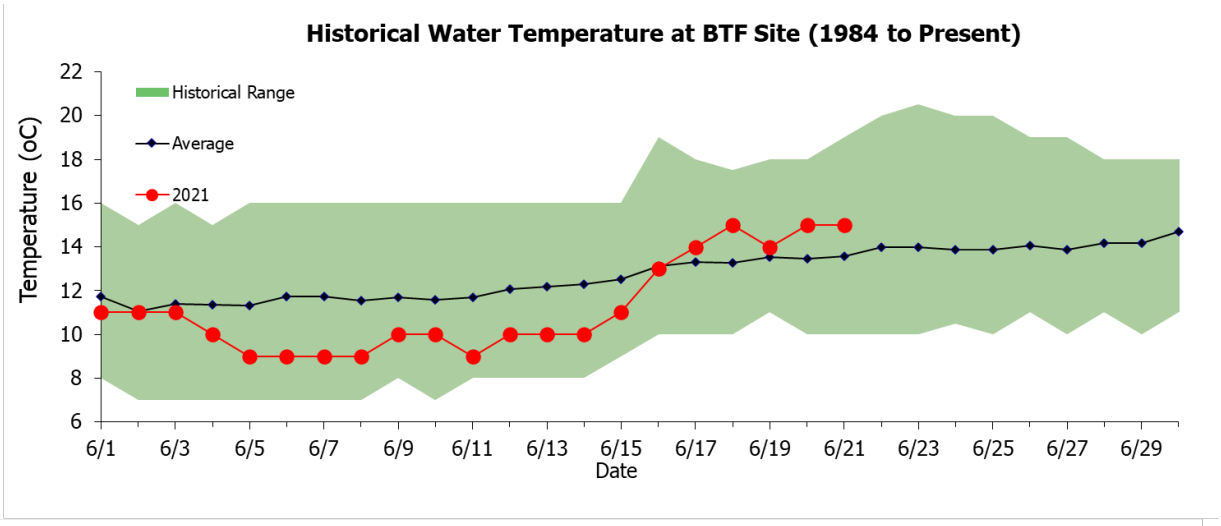
TABLE A8. Summary of drift net trip start time by fishing area.

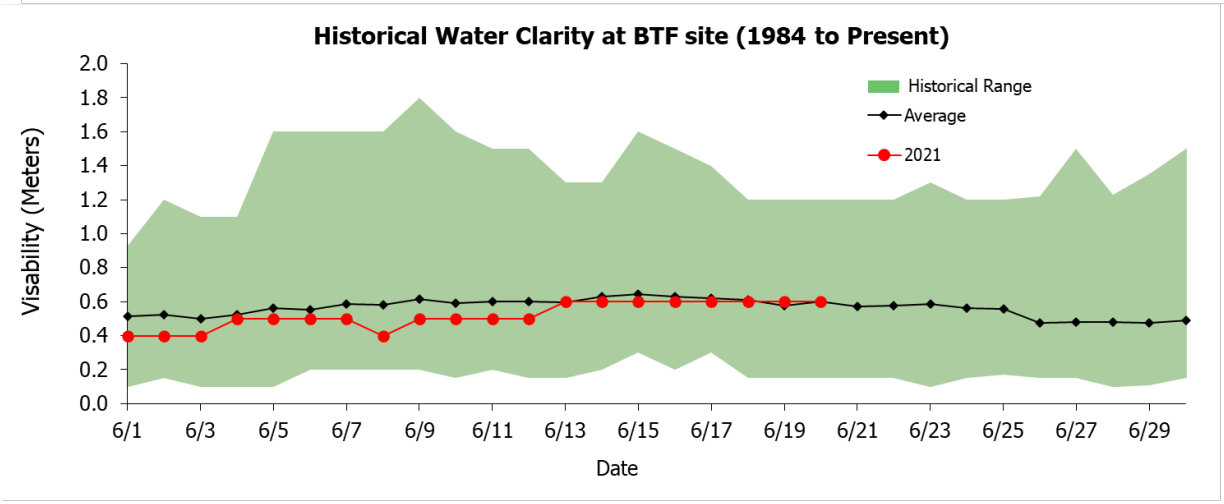
Area	N	Min	25%	Mean	75%	Max
Tuntutuliak ⟷ Johnson R.	46	5:00 AM	6:00 AM	7:41 AM	9:30 AM	12:00 PM
Johnson R. ⟷ Napaskiak	69	5:30 AM	6:00 AM	8:07 AM	9:30 AM	3:30 PM
Napaskiak ⟷ Akiachak	111	5:00 AM	6:00 AM	8:15 AM	10:00 AM	4:00 PM
All	**226**	**5:00 AM**	**6:00 AM**	**8:06 AM**	**9:30 AM**	**4:00 PM**

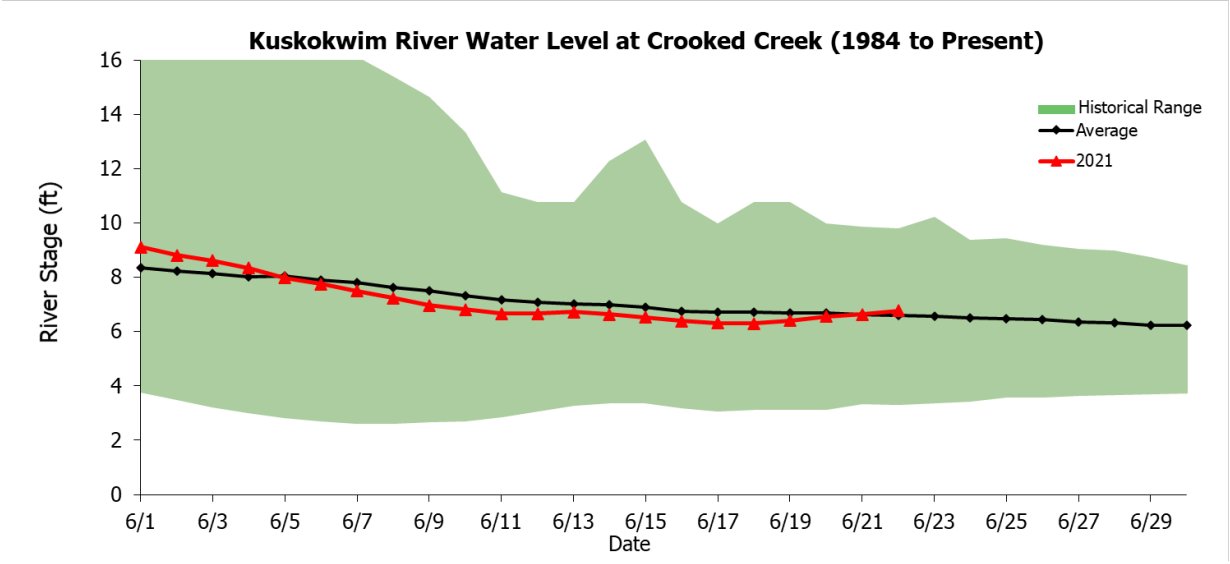
TABLE A9. Summary of drift net trip end time by fishing area.

Area	N	Min	25%	Mean	75%	Max
Tuntutuliak ⟷ Johnson R.	46	8:22 AM	3:00 PM	4:21 PM	6:00 PM	7:30 PM
Johnson R. ⟷ Napaskiak	69	11:00 AM	2:03 PM	3:58 PM	5:45 PM	7:57 PM
Napaskiak ⟷ Akiachak	111	8:48 AM	1:00 PM	3:16 PM	5:30 PM	7:30 PM
All	**226**	**8:22 AM**	**2:00 PM**	**3:42 PM**	**6:00 PM**	**7:57 PM**

Weather summary at BTF as of 6/21







Kuskokwim River Salmon Assessment Update
6/21/2021

This document presents the key assessment information considered by managers in-season. The production of this document is a collaborative effort between USFWS and ADF&G. **All data and analyses contained are preliminary and are subject to change, so please make interpretations carefully**.

If you have any questions about the content, please contact Spencer Rearden (USFWS; spencer_rearden@fws.gov) or Sean Larson (ADF&G; sean.larson@alaska.gov). Major credit for the development of this data packet belongs to Benjamin Staton.

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Abbreviations:

- BTF: Bethel Test Fishery
- ATF: Aniak Test Fishery
- CPUE: Catch-per-unit-effort
- EOS: End-of-Season
- ADF&G: Alaska Department of Fish and Game
- KRITFC: Kuskokwim River Inter-tribal Fisheries Commission
- ONC: Orutsaramiut Native Council
- USFWS: United States Fish and Wildlife Service
- YDNWR: Yukon Delta National Wildlife Refuge

To view escapement information, please visit the ADF&G Kuskokwim River Fish Counts page:

- http://www.adfg.alaska.gov/index.cfm?adfg=commercialbyareakuskokwim.salmon#fishcounts

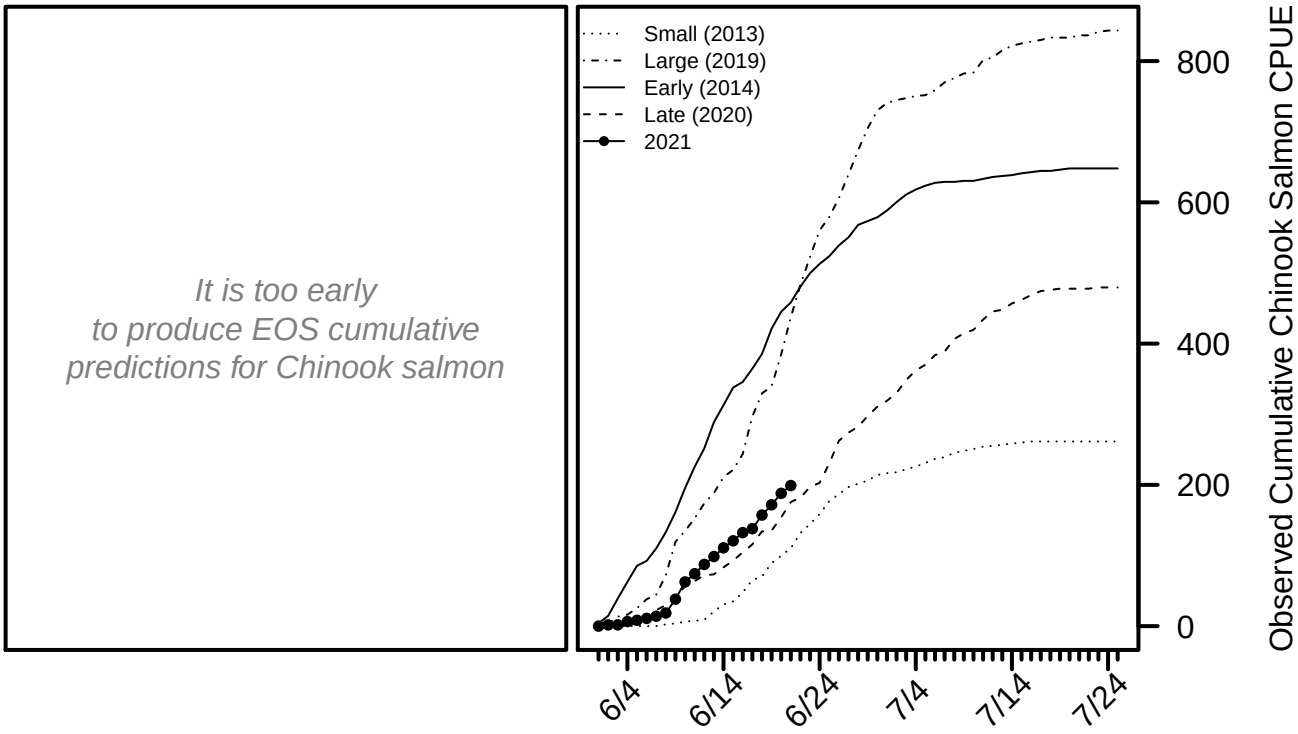
For the most up-to-date information regarding fishing opportunities please visit:

- **USFWS:** https://www.fws.gov/refuge/yukon_delta/wildlife_and_habitat/dailyupdate.html
- **ADF&G:** http://www.adfg.alaska.gov/index.cfm?adfg=cfnews.main

Chinook Salmon BTF Summary (6/21)

- The BTF daily CPUE was **11**.
- The BTF cumulative CPUE is now **199**.
- **31%** years since 2008 fell below this cumulative CPUE on this date.
- **46%** of the run is complete based on historical average run timing.
- **35% - 57%** of the run is complete based the central 50% of all historical run timing scenarios.
- **19%** of the run is expected to pass Bethel in the next 5 days.
- Over the last 3 days, Chinook salmon made up **56%** of the BTF catches, compared to **18%** on average.

Chinook Salmon Figure 1. *Left*: will show predicted cumulative EOS BTF CPUE according to various run timing scenarios when enough data have been collected. *Right*: The cumulative BTF CPUE from 2021 plotted along with four previous years intended to represent a range of early/late and small/large index values.



For more detailed information, see the ***Chinook salmon appendix*** *at the end of this document.*

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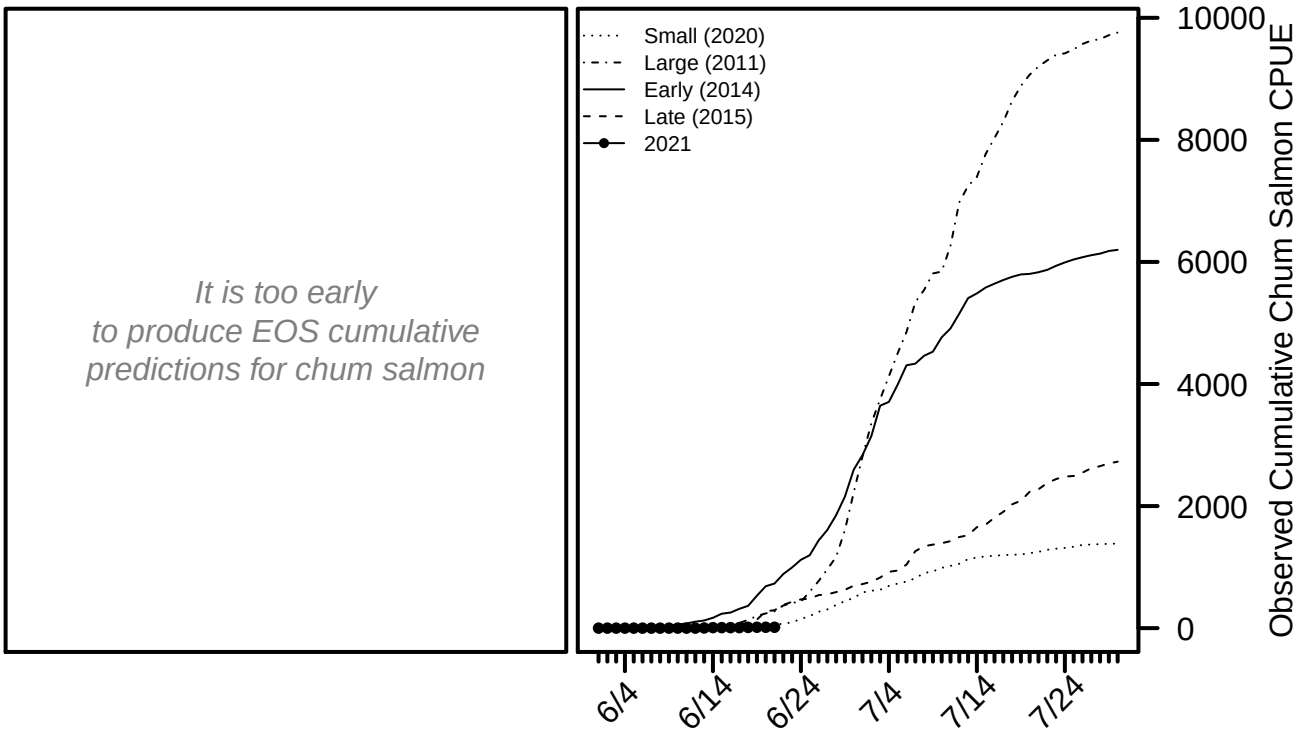
Chum Salmon BTF Summary (6/21)

- The BTF daily CPUE was **0**.
- The BTF cumulative CPUE is now **14**.
- **0%** years since 2008 fell below this cumulative CPUE on this date.
- **7%** of the run is complete based on historical average run timing.
- **3% - 13%** of the run is complete based the central 50% of all historical run timing scenarios.
- **7% - 15%** of the run is expected to pass Bethel in the next 5 days.
- Over the last 3 days, chum salmon made up **3%** of the BTF catches, compared to **49%** on average.

Chum Salmon Figure 1. *Left*: will show predicted cumulative EOS BTF CPUE according to various run timing scenarios when enough data have been collected. *Right*: The cumulative BTF CPUE from 2021 plotted along with four previous years intended to represent a range of early/late and small/large index values.



For more detailed information, see the ***chum salmon appendix*** *at the end of this document.*

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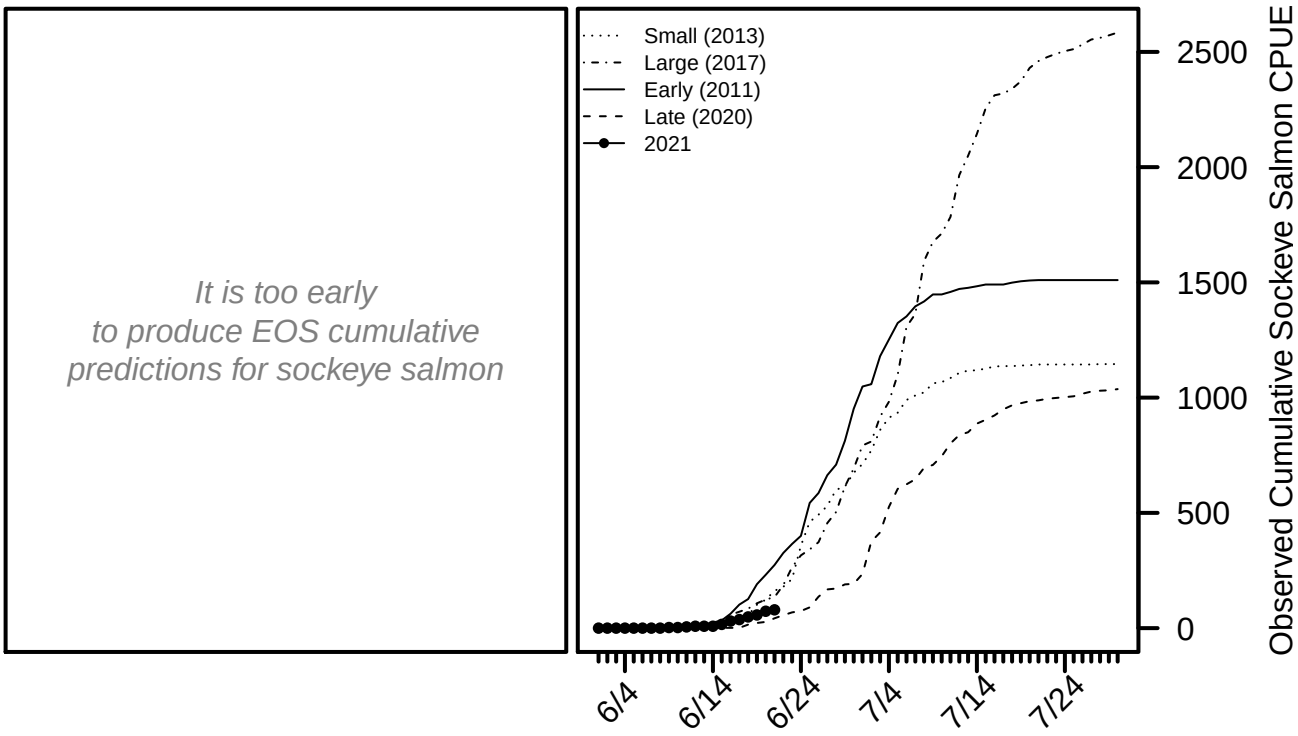
Sockeye Salmon BTF Summary (6/21)

- The BTF daily CPUE was **6**.
- The BTF cumulative CPUE is now **79**.
- **23%** years since 2008 fell below this cumulative CPUE on this date.
- **14%** of the run is complete based on historical average run timing.
- **7% - 24%** of the run is complete based the central 50% of all historical run timing scenarios.
- **15% - 27%** of the run is expected to pass Bethel in the next 5 days.
- Over the last 3 days, sockeye salmon made up **41%** of the BTF catches, compared to **33%** on average.

Sockeye Salmon Figure 1. *Left*: will show predicted cumulative EOS BTF CPUE according to various run timing scenarios when enough data have been collected. *Right*: The cumulative BTF CPUE from 2021 plotted along with four previous years intended to represent a range of early/late and small/large index values.



For more detailed information, see the ***sockeye salmon appendix*** *at the end of this document.*

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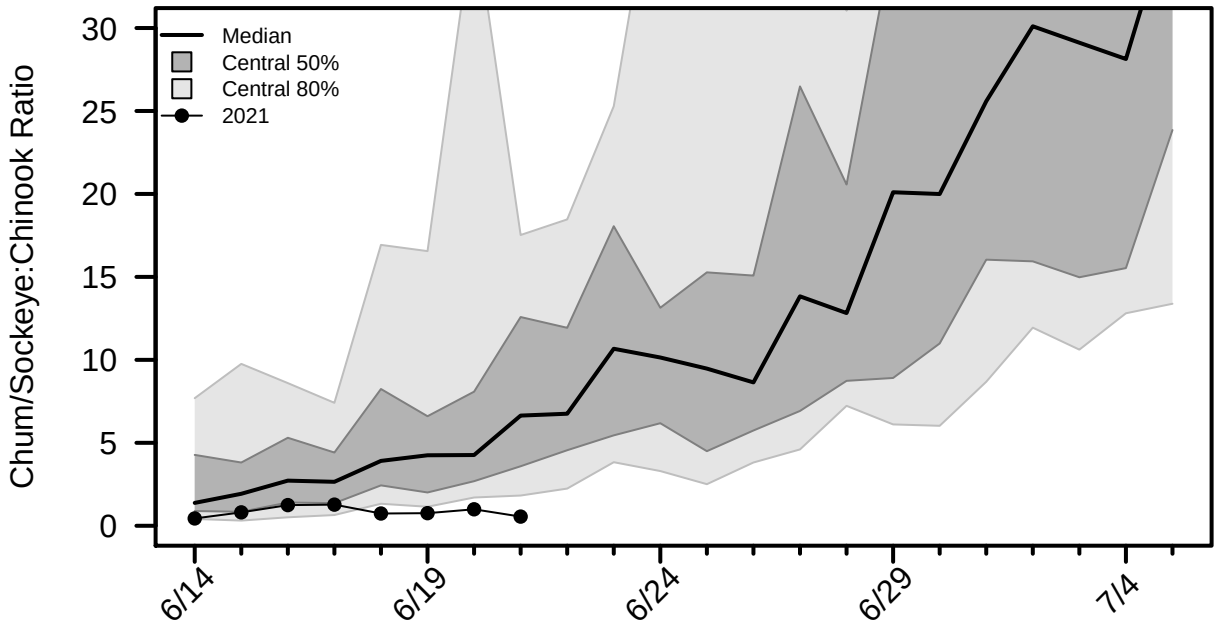
Chum/Sockeye:Chinook Salmon Ratio

This ratio is calculated by dividing the total number of chum and sockeye salmon counted by the number of Chinook salmon counted by a project each day. A value of zero indicates Chinook salmon were counted that day, but not chum or sockeye salmon. A missing value on a day the project operated indicates no Chinook salmon were counted that day.

Species Ratio Figure 1. Time series of the species ratio with historical quantiles shown as grey regions and the ratio time series for 2021 shown with points connected by lines.



Ratio Table 1. A subset of the species ratios, including the ratios from the ATF.

Date	2021 BTF	BTF Median	BTF Lower 10%	BTF Upper 10%	2021 ATF
6/18	0.74	3.91	1.33	16.93	0
6/19	0.76	4.25	1.15	16.55	0.23
6/20	0.99	4.26	1.7	36.85	0
6/21	**0.55**	**6.64**	**1.82**	**17.53**	**0**
6/22		6.75	2.24	18.47	
6/23		10.67	3.83	25.29	
6/24		10.14	3.3	41.8	

Ratio Table 2. The percent of previous years in which a given species ratio was exceeded at least once before a certain day in the BTF.

Date	Ratio > 1	Ratio > 3	Ratio > 5	Ratio > 10	Ratio > 20
6/18	95%	78%	57%	35%	11%
6/19	95%	86%	70%	41%	14%
6/20	100%	89%	76%	49%	22%
6/21	**100%**	**92%**	**89%**	**59%**	**22%**
6/22	100%	95%	95%	65%	22%
6/23	100%	97%	95%	68%	32%
6/24	100%	97%	95%	76%	38%

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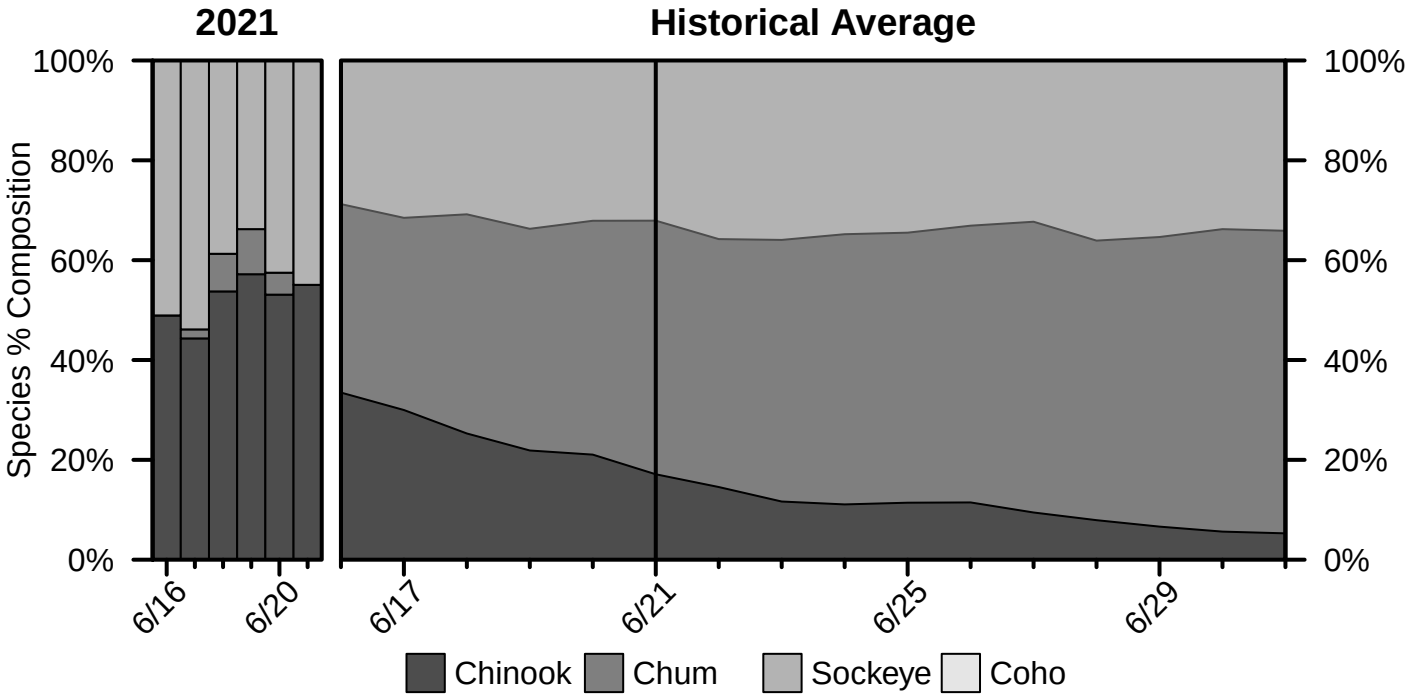
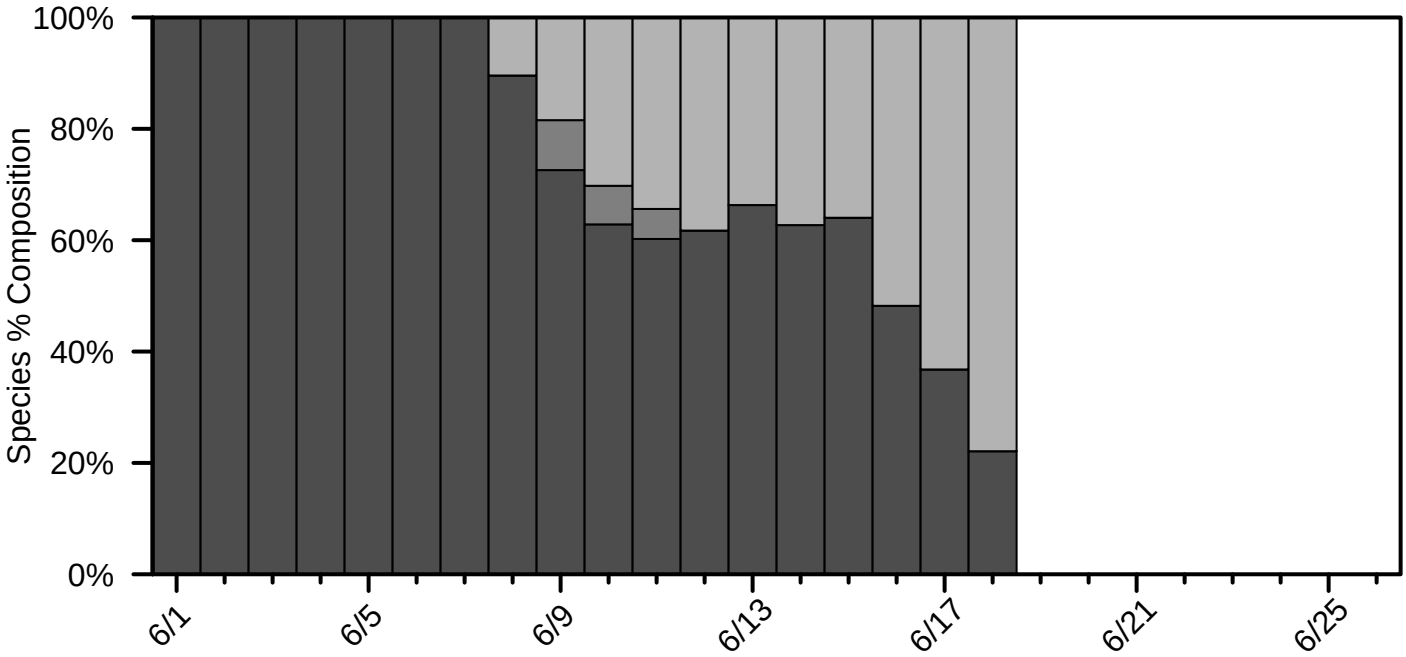
Percent Composition by Salmon Species

Percent Composition Figure 1. Species percent composition in the BTF from 2021 and based on the historical average. The composition presented on each day represents the average composition over the past 2 days.



Species Composition Figure 2. Species percent composition from the sonar estimates from 2021 (salmon species only, excluding pink salmon). The composition presented on each day represents the average composition over the past 3 days.



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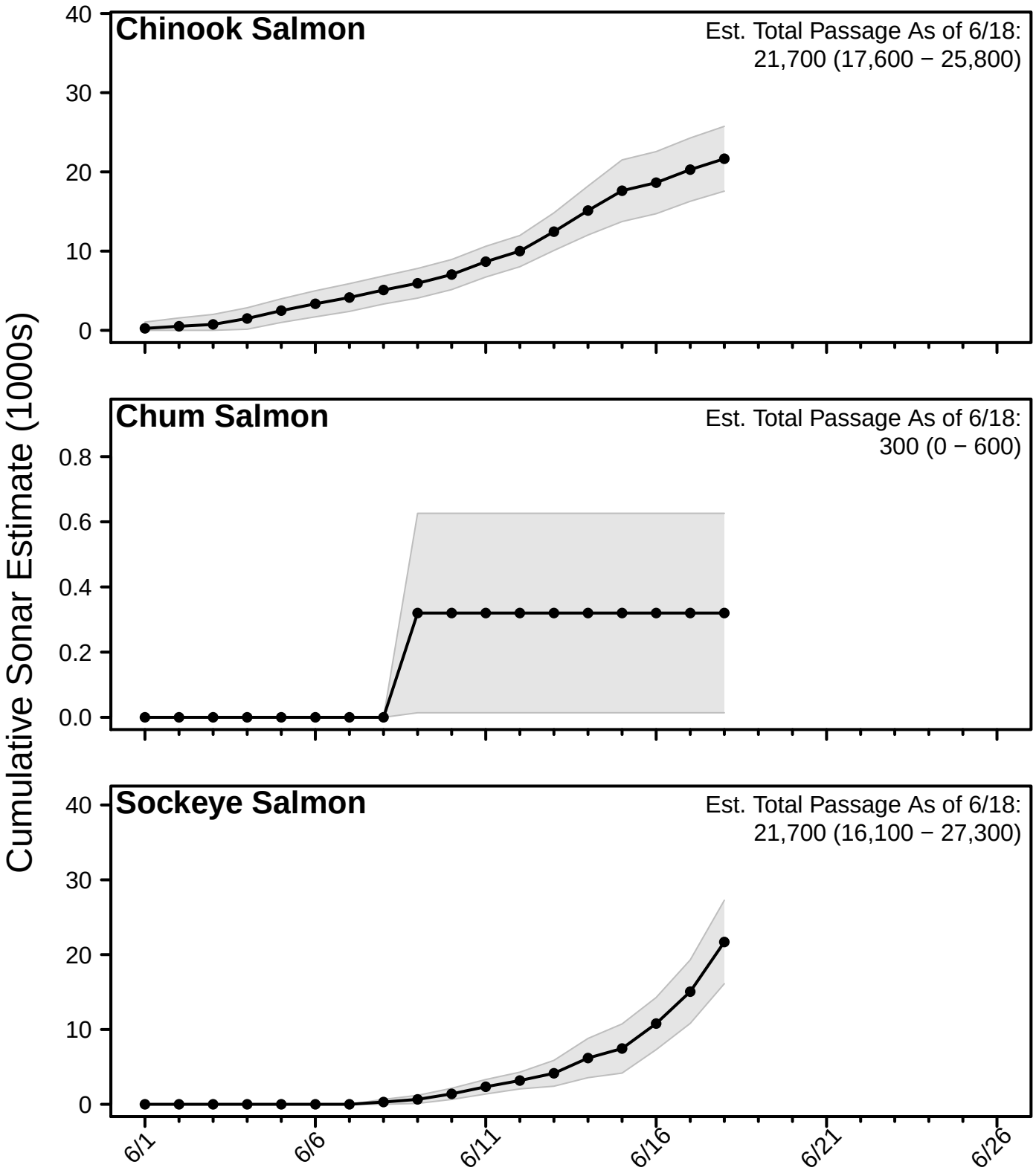
Sonar Passage Estimates

Sonar Figure 1. Cumulative estimates of salmon passage from the 2021 sonar operation through the last complete reporting day. Grey bands show the 95% confidence intervals on each complete reporting day.



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In-Season Harvest Estimates

In-season harvest estimates are produced by combining counts of total fishing effort (usually obtained via aerial surveys performed by USFWS) and on-the-ground fisher interview information using statistically-rigorous methodology. The data collection efforts to produce these estimates is a highly collaborative effort, involving staff from KRITFC and ONC, with harvest data collected by community based harvest monitors and ONC. Fishing periods from 6/2-6/9 were set net only opportunities. More detailed information can be found on the KRITFC website (https://www.kuskosalmon.org/2021-fishing-info).

In the tables below, CV stands for coefficient of variation, which is a commonly-used measure of uncertainty in the estimate (larger CV values are more uncertain).

Harvest Table 1. Estimated total Chinook salmon harvest within the YDNWR, excluding the section between Akiak and Aniak.

Date	Daily Harvest	Cumulative Harvest	Daily CV	Cumulative CV
6/2	30	30	0.23	0.23
6/5	310	340	0.47	0.43
6/9	480	820	0.19	0.21
6/12	3,220	4,040	0.06	0.06
6/15	6,780	10,820	0.06	0.04
6/19	6,190	17,010	0.08	0.04

Harvest Table 2. Estimated total chum salmon harvest within the YDNWR, excluding the section between Akiak and Aniak.

Date	Daily Harvest	Cumulative Harvest	Daily CV	Cumulative CV
6/2	0	0	0	0
6/5	20	20	0.65	0.66
6/9	0	20	0	0.66
6/12	70	90	0.18	0.2
6/15	350	440	0.15	0.13
6/19	990	1,430	0.19	0.14

Harvest Table 3. Estimated total sockeye salmon harvest within the YDNWR, excluding the section between Akiak and Aniak.

Date	Daily Harvest	Cumulative Harvest	Daily CV	Cumulative CV
6/2	0	0	0	0
6/5	50	50	0.44	0.44
6/9	20	70	0.43	0.34
6/12	340	410	0.16	0.14
6/15	1,400	1,810	0.11	0.09
6/19	2,400	4,210	0.07	0.06

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Chinook Salmon Appendix

Chinook Salmon Table A1. Cumulative CPUE from the BTF.

Date	2021	2020	2019	2018	2017	5-Yr Avg.	2008 - 2020 Avg.
6/18	157	134	330	189	47	193	185
6/19	172	135	339	199	71	204	204
6/20	188	154	385	213	81	227	226
6/21	**199**	**176**	**438**	**221**	**94**	**249**	**249**
6/22		182	483	235	109	270	272
6/23		197	523	275	121	294	297
6/24		203	561	306	148	319	319
EOS		487	848	667	374	613	568

Chinook Salmon Table A2. Cumulative CPUE from the ATF.

Date	2021	2020	2019	2018	2017
6/18	233	140	795	134	725
6/19	261	167	810	134	792
6/20	302	218	836	141	906
6/21	**387**	**245**	**836**	**165**	**1,081**
6/22		285	953	172	1,244
6/23		311	973	172	1,481
6/24		357	1,023	180	1,645
EOS		1,874	1,691	820	6,508

Chinook Salmon Table A3. Percent of run complete according to various historical run timing scenarios from the BTF.

Timing	Midpoint	6/21 Cumulative %
Earliest	6/14	75%
Early 10%	6/18	66%
Early 25%	6/21	57%
Median	6/22	46%
Late 25%	6/25	35%
Late 10%	6/26	26%
Latest	7/3	18%

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Chum Salmon Appendix

Chum Salmon Table A1. Cumulative CPUE from the BTF.

Date	2021	2020	2019	2018	2017	5-Yr Avg.	2008 - 2020 Avg.
6/18	12	44	34	244	206	117	144
6/19	14	50	36	314	326	157	201
6/20	14	50	55	405	345	195	257
6/21	**14**	**59**	**95**	**447**	**388**	**239**	**324**
6/22		71	108	518	482	284	407
6/23		95	186	716	565	369	507
6/24		150	224	787	698	442	592
EOS		1,442	6,427	8,212	6,785	5,352	6,256

Chum Salmon Table A2. Cumulative CPUE from the ATF.

Date	2021	2020	2019	2018	2017
6/18	0	13	5	32	206
6/19	6	26	5	95	222
6/20	6	32	5	137	271
6/21	**6**	**45**	**5**	**168**	**417**
6/22		52	5	209	607
6/23		59	19	264	728
6/24		65	31	286	927
EOS		2,611	1,051	10,277	11,588

Chum Salmon Table A3. Percent of run complete according to various historical run timing scenarios from the BTF.

Timing	Midpoint	6/21 Cumulative %
Earliest	6/23	30%
Early 10%	7/1	20%
Early 25%	7/3	13%
Median	7/6	7%
Late 25%	7/8	3%
Late 10%	7/11	1%
Latest	7/15	<1%

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Sockeye Salmon Appendix

Sockeye Salmon Table A1. Cumulative CPUE from the BTF.

Date	2021	2020	2019	2018	2017	5-Yr Avg.	2008 - 2020 Avg.
6/18	49	15	29	16	84	33	58
6/19	57	22	35	19	108	45	83
6/20	73	27	63	33	124	60	104
6/21	**79**	**43**	**86**	**33**	**135**	**71**	**131**
6/22		56	138	46	187	98	173
6/23		68	173	72	265	136	216
6/24		74	204	91	316	161	257
EOS		1,060	2,685	2,275	2,690	2,234	1,779

Sockeye Salmon Table A2. Cumulative CPUE from the ATF.

Date	2021	2020	2019	2018	2017
6/18	0	0	0	0	7
6/19	0	0	0	0	7
6/20	0	0	0	0	7
6/21	**0**	**0**	**0**	**0**	**7**
6/22		0	0	0	58
6/23		0	0	0	67
6/24		0	0	0	67
EOS		209	33	75	393

Sockeye Salmon Table A3. Percent of run complete according to various historical run timing scenarios from the BTF.

Timing	Midpoint	6/21 Cumulative %
Earliest	6/22	48%
Early 10%	6/24	34%
Early 25%	6/27	24%
Median	6/29	14%
Late 25%	7/2	7%
Late 10%	7/6	3%
Latest	7/10	1%

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Bering Sea Bycatch Update

Bycatch updated through June 17, 2021

- King salmon bycatch to date: **10,910** (all stocks)
- Non-king salmon bycatch to date: **671** (all stocks)

Important: Kuskokwim River fish are a small component of the total bycatch.

Background Information

- Bycatch occurs in the Bering Sea and Aleutian Island (BSAI) groundfish fishery, which is managed by the National Marine Fisheries Service and is one of the most extensively monitored fisheries in the U.S.
- The 2011–2020[1] average king bycatch of all stocks is ~23,000
- The impact of bycatch on adult Kuskokwim River King salmon runs is small compared to other sources of mortality and does not explain the magnitude of declines we have observed on the Kuskokwim River.

  We think this is true because:

  - The Kuskokwim River is only one of many stocks that make up the total bycatch (other stocks range from California, Alaska, to Russia)
  - The Kuskokwim River is one part of the Western Alaska stock group[2], which makes up about 45%–70% of the total annual bycatch.
  - Most of the bycatch is made up of juvenile fish, many of which would not have survived to adulthood due to natural mortality[3].
  - Of the fish that would have survived in they had not been caught, only subset of them would have returned this year because salmon spend a varying amount of time in ocean.

Helpful Links

Bycatch numbers are reported by the National Marine Fisheries Service, available at: https://alaskafisheries.noaa.gov/fisheries-catch-landings?tid=286

Bycatch updates are reported by the North Pacific Fisheries Management Council, available at: https://www.npfmc.org/bsai-salmon-bycatch/

[1] 2011–2020 is the recent 10-year average. In 2011, amendments to Fishery Management Plans were enacted to reduce King salmon bycatch in the BSAI Pollok fishery.
[2] The Western Alaska group includes Bristol Bay, Kuskokwim, Yukon, and Norton Sound stocks.
[3] It is estimated that about 90% of all salmon that enter the marine environment die of natural causes.