

Kuskokwim River Salmon Assessment Update

6/28/2018



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.**

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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 Fish Commission
- OTNC: Orutsaramiut Traditional 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>

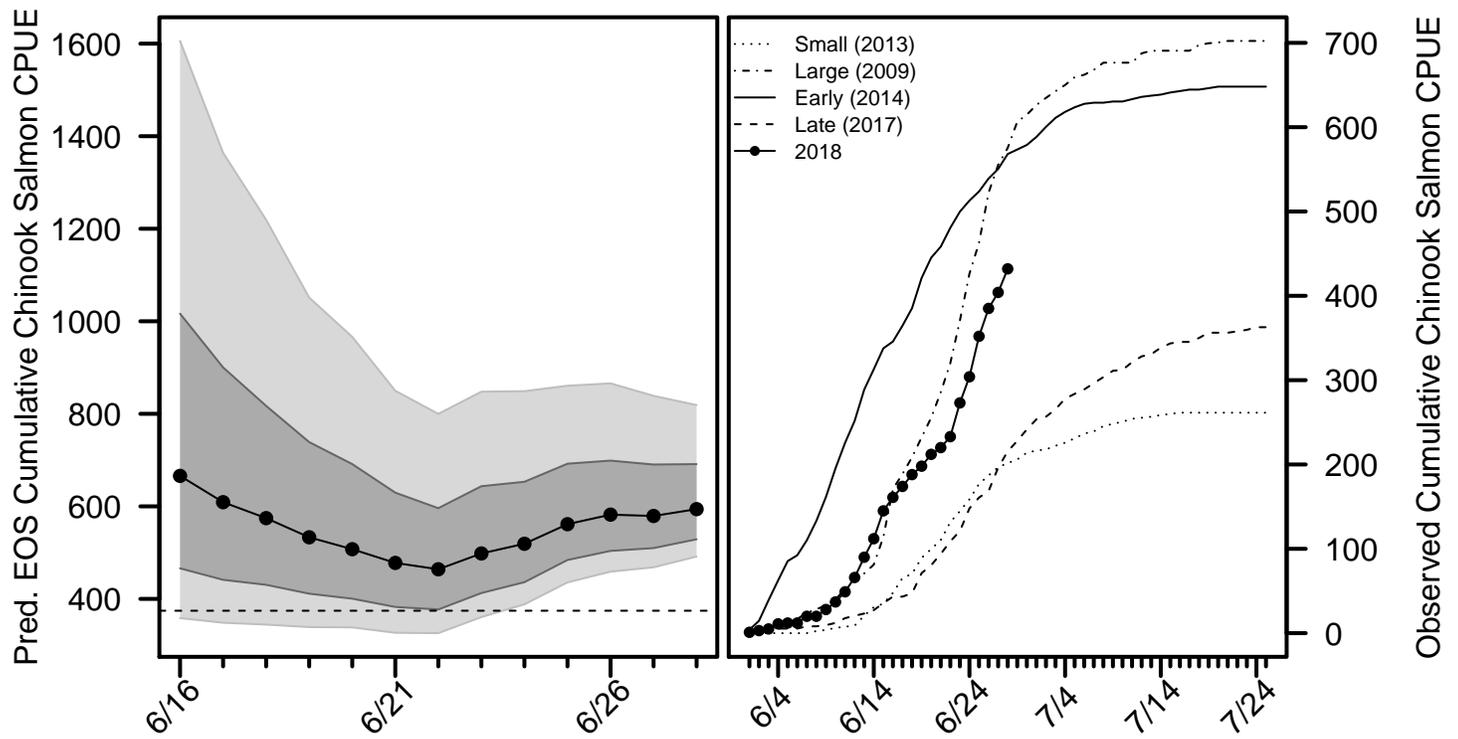
For the most up-to-date information regarding fishing opportunities please visit:

- 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 (6/28)

- The BTF daily CPUE was **28**.
- The BTF cumulative CPUE is now **432**.
- **70%** years since 2008 fell below this cumulative CPUE on this date.
- **73%** of the run is complete based on historical average run timing.
- **63% - 82%** of the run is complete based the central 50% of all historical run timing scenarios.
- **8% - 15%** of the run is expected to pass Bethel in the next 5 days.
- Over the last 3 days, Chinook salmon made up **15%** of the BTF catches, compared to **8%** on average.

Chinook Salmon Figure 1. *Left:* predicted cumulative EOS BTF CPUE according to various run timing scenarios: central 80% (light grey band), central 50% (dark grey band), and the historical median (circles). The dashed horizontal line shows the EOS value from 2017. *Right:* The cumulative BTF CPUE from 2018 plotted along with four previous years intended to represent a range of early/late and small/large index values.



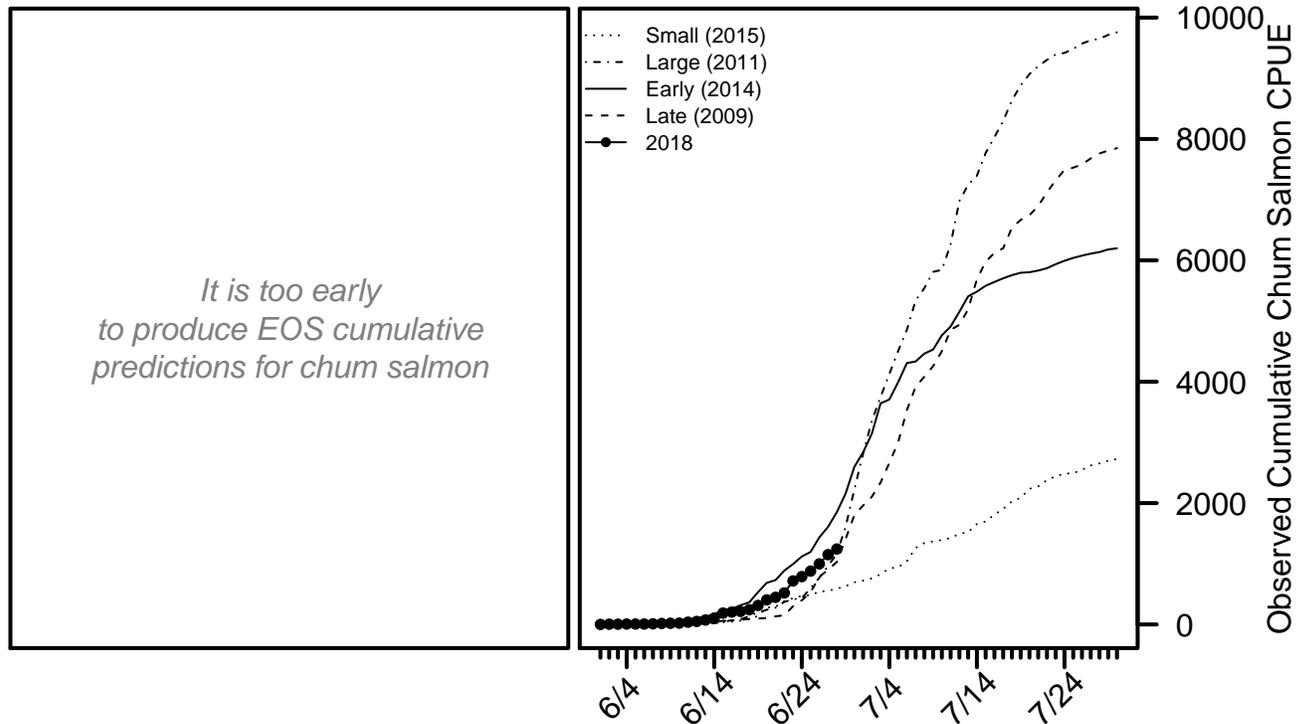
For more detailed information, see the [Chinook salmon appendix](#) at the end of this document.

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Chum Salmon BTF Summary (6/28)

- The BTF daily CPUE was **93**.
- The BTF cumulative CPUE is now **1,243**.
- **60%** years since 2008 fell below this cumulative CPUE on this date.
- **25%** of the run is complete based on historical average run timing.
- **17% - 35%** of the run is complete based the central 50% of all historical run timing scenarios.
- **17% - 20%** of the run is expected to pass Bethel in the next 5 days.
- Over the last 3 days, chum salmon made up **68%** of the BTF catches, compared to **57%** 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 2018 plotted along with four previous years intended to represent a range of early/late and small/large index values.



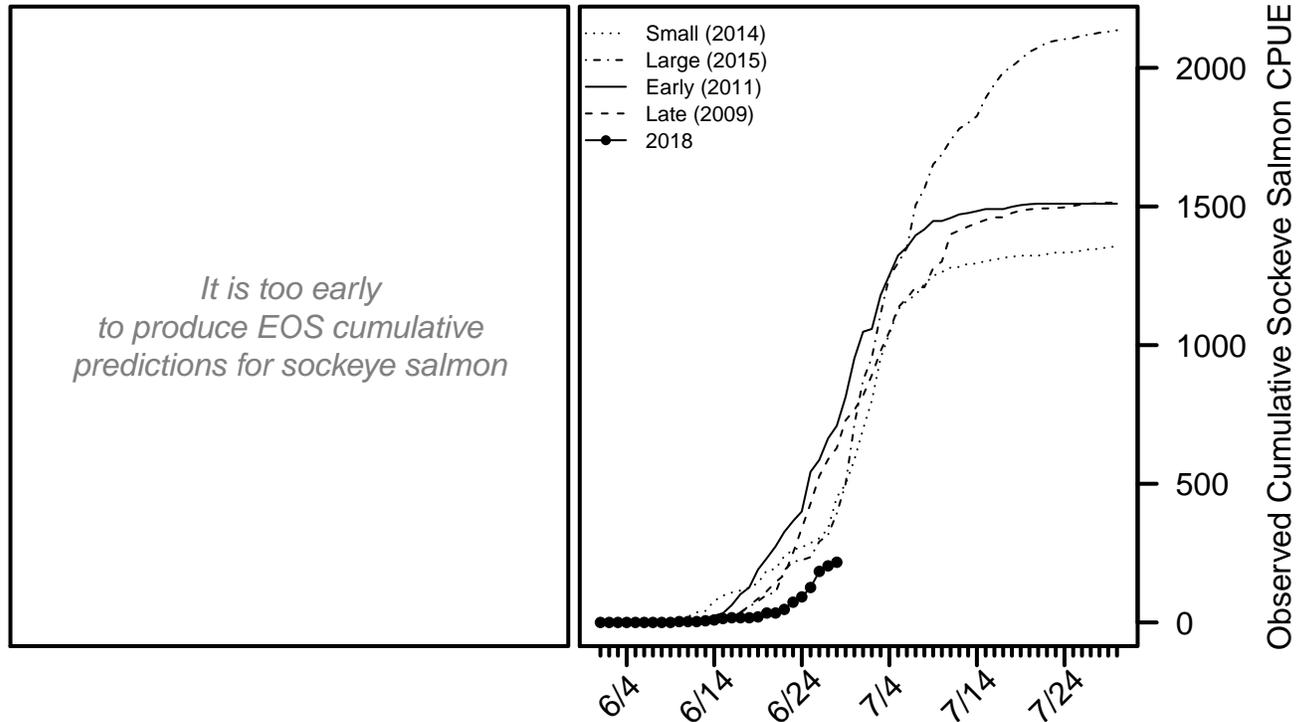
For more detailed information, see the [chum salmon appendix](#) at the end of this document.

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Sockeye Salmon BTF Summary (6/28)

- The BTF daily CPUE was **13**.
- The BTF cumulative CPUE is now **217**.
- **0%** years since 2008 fell below this cumulative CPUE on this date.
- **48%** of the run is complete based on historical average run timing.
- **35% - 61%** of the run is complete based the central 50% of all historical run timing scenarios.
- **23% - 26%** of the run is expected to pass Bethel in the next 5 days.
- Over the last 3 days, sockeye salmon made up **17%** of the BTF catches, compared to **35%** 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 2018 plotted along with four previous years intended to represent a range of early/late and small/large index values.



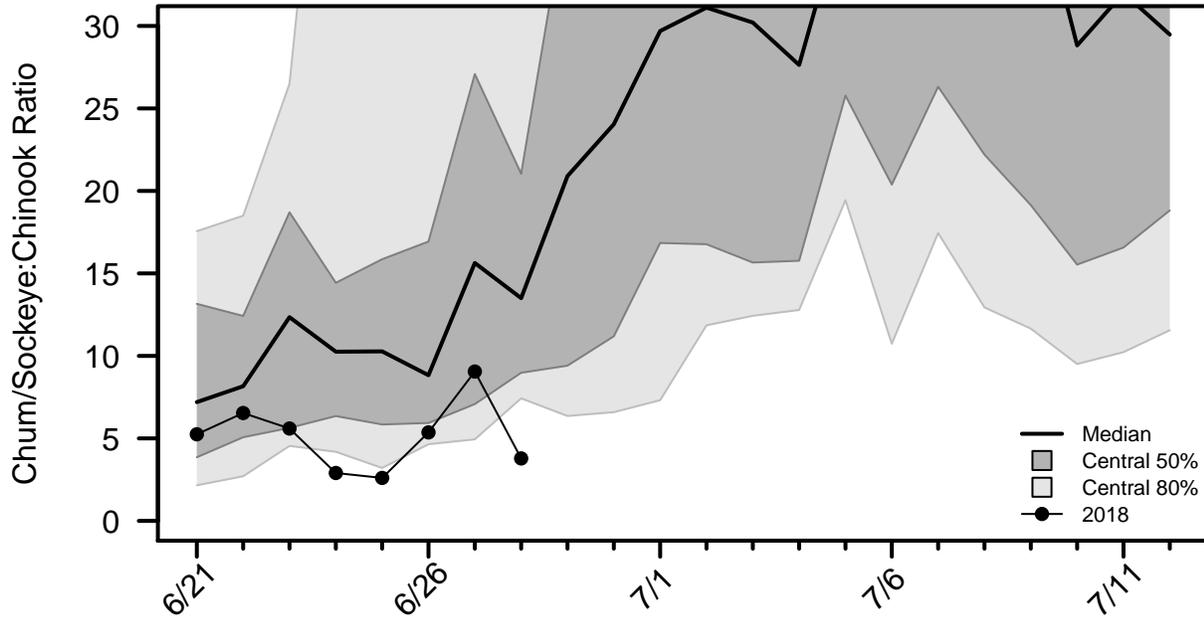
For more detailed information, see the [sockeye salmon appendix](#) at the end of this document.

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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 in the BTF with historical quantiles shown as grey regions and the ratio time series for 2018 shown with points connected by lines.



Ratio Table 1. A subset of the species ratios displayed in **Ratio Figure 1**, including the ratios from the ATF.

Date	2018 BTF	BTF Median	BTF Lower 10%	BTF Upper 10%	2018 Sonar	2018 ATF
6/25	2.6	10.28	3.21	45.47	0.79	2.96
6/26	5.36	8.83	4.65	34.14	2.88	6.13
6/27	9.05	15.63	4.94	49.46		10.44
6/28	3.79	13.5	7.43	31.24		7.06
6/29		20.9	6.36	57.89		
6/30		24.04	6.59	60.68		
7/1		29.69	7.31	58.18		

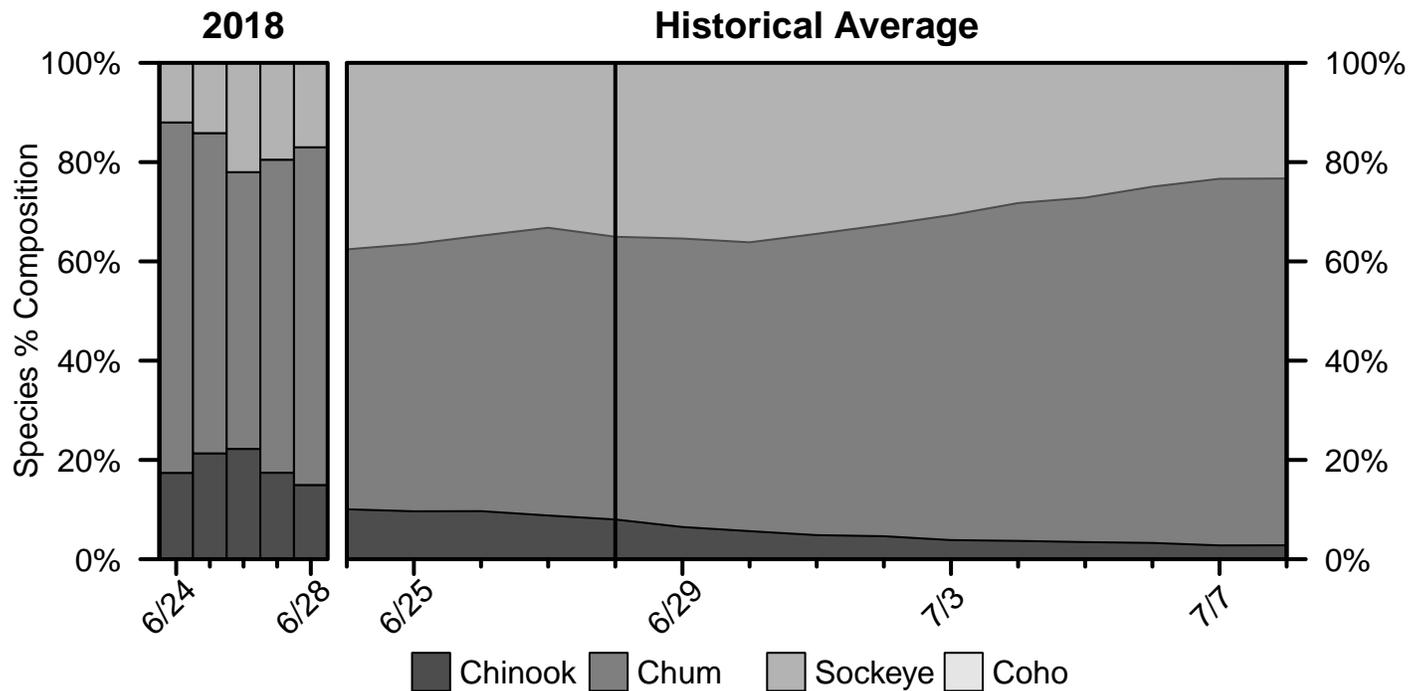
Ratio Table 2. The percent of previous years in which a given species ratio was exceeded at least once before a certain day in the BTF.

Date	Ratio > 10	Ratio > 15	Ratio > 20	Ratio > 25
6/25	88%	62%	44%	32%
6/26	91%	65%	47%	35%
6/27	91%	79%	59%	47%
6/28	94%	82%	68%	53%
6/29	97%	91%	76%	68%
6/30	97%	91%	82%	79%
7/1	100%	97%	88%	88%

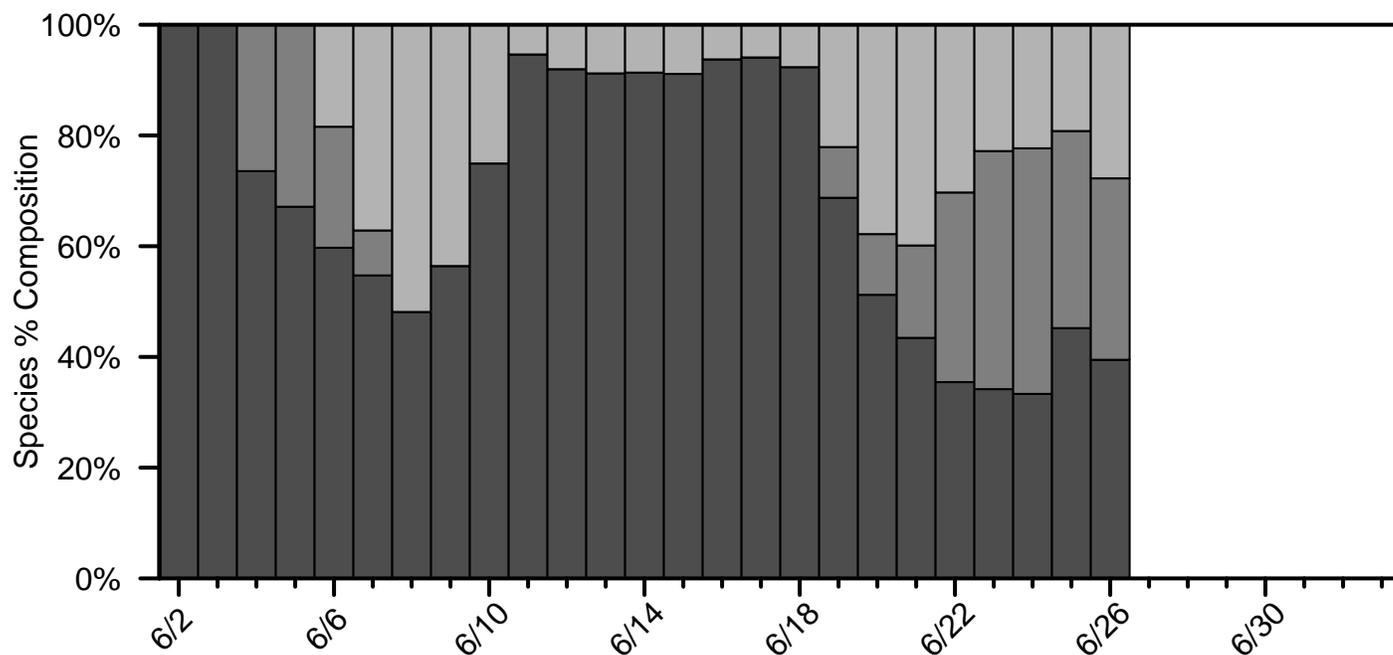
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Percent Composition by Salmon Species

Percent Composition Figure 1. Species percent composition in the BTF from 2018 and based on the historical average. The composition presented on each day represents the average composition over the past 3 days.



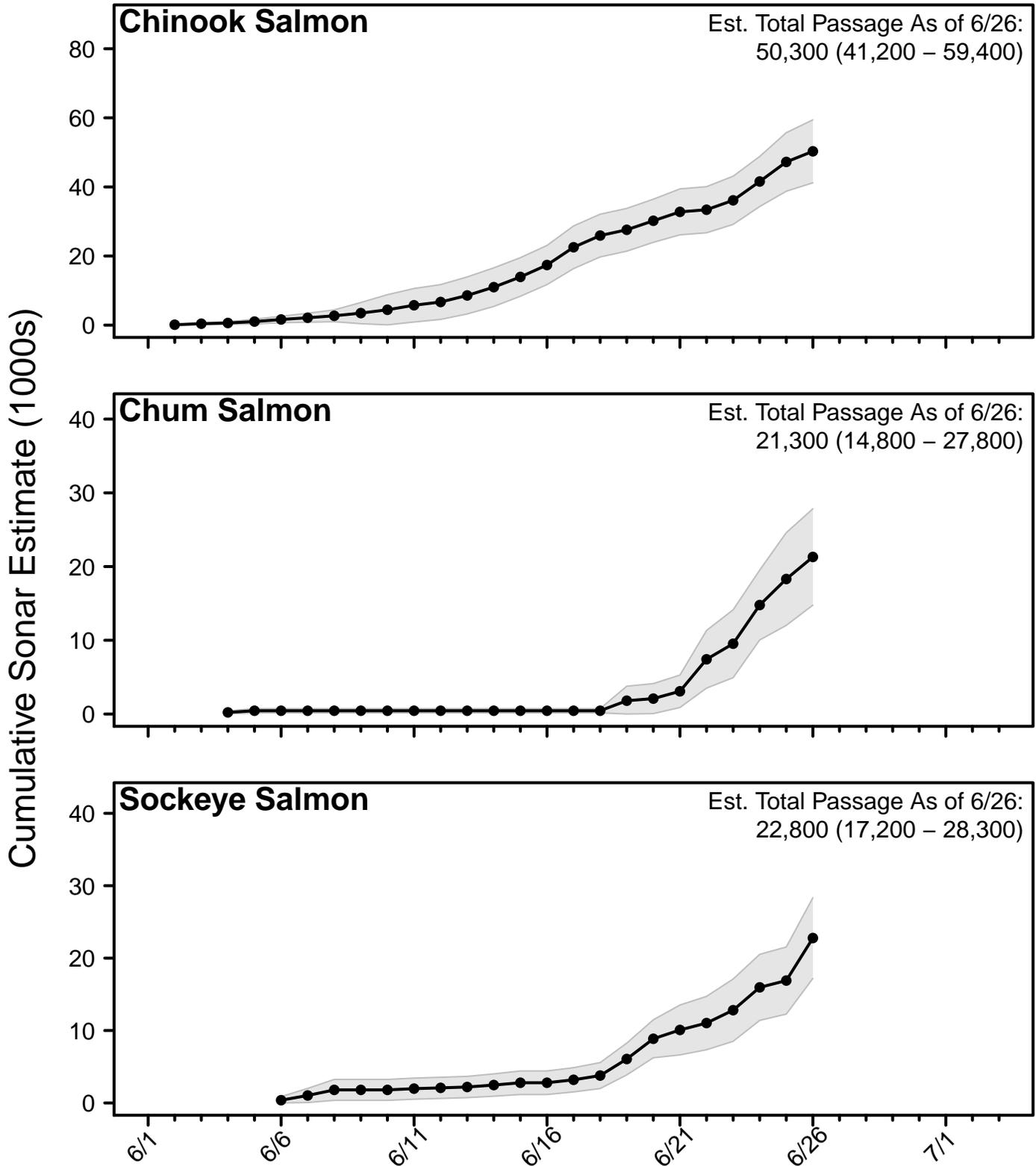
Species Composition Figure 2. Species percent composition from the sonar estimates from 2018 (salmon species only, excluding pink salmon). The composition presented on each day represents the average composition over the past 3 days.



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Sonar Passage Estimates

Sonar Figure 1. Cumulative estimates of salmon passage from the 2018 sonar operation through the last complete reporting day. Grey bands show the 95% confidence intervals on each complete reporting day. **Sonar operations have not been fully operational since 6/21.**



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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 survey) 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 ADF&G, KRITFC, OTNC, and USFWS. Although USFWS performs the data analysis and harvest estimation, all estimates undergo technical review by a panel comprised of representatives from each of these entities.

Much more detailed information can be found on the YDNWR website (https://www.fws.gov/refuge/yukon_delta/wildlife_and_habitat/dailyupdate.html).

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).

Spatial Coverage:

- The 6/6 estimate was for a set net only opportunity and covers the main-stem Kuskokwim River between Tuntutuliak and Akiak.
- The 6/12 and 6/16 estimates cover the main-stem between Tuntutuliak and Akiak and between Kalskag and Aniak.
- The 6/24 estimate covers the main-stem between Tuntutuliak and Akiak.

Harvest Table 1. Estimated total Chinook salmon harvest within the YDNWR.

Date	Daily Harvest	Cumulative Harvest	Daily CV	Cumulative CV
6/6	100	100	0.21	0.21
6/12	5,340	5,440	0.09	0.09
6/16	5,710	11,150	0.09	0.06
6/24	6,100	17,250	0.07	0.05

Harvest Table 2. Estimated Chinook salmon harvested downstream of the BTF.

Date	Daily Harvest	Cumulative Harvest	Daily CV	Cumulative CV
6/6	30	30	0.29	0.29
6/12	3,210	3,240	0.1	0.1
6/16	3,530	6,770	0.11	0.07
6/24	3,700	10,470	0.08	0.06

Harvest Table 3. Estimated total chum salmon harvest within the YDNWR.

Date	Daily Harvest	Cumulative Harvest	Daily CV	Cumulative CV
6/12	1,830	1,830	0.16	0.16
6/16	2,800	4,630	0.1	0.09
6/24	8,890	13,520	0.07	0.06

Harvest Table 3. Estimated total sockeye salmon harvest within the YDNWR.

Date	Daily Harvest	Cumulative Harvest	Daily CV	Cumulative CV
6/12	250	250	0.21	0.21
6/16	450	700	0.19	0.14
6/24	3,660	4,360	0.08	0.07

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Chinook Salmon Appendix

Chinook Salmon Table A1. Cumulative CPUE from the BTF.

Date	2018	2017	2016	2015	2014	5-Yr Avg.	2008 - 2017 Avg.
6/25	352	161	400	347	524	322	324
6/26	385	168	432	366	539	339	349
6/27	404	196	454	372	550	354	366
6/28	432	216	463	387	568	367	380
6/29		228	484	405	573	379	398
6/30		242	499	431	579	393	413
7/1		254	510	444	588	402	424
EOS		374	687	625	650	519	538

Chinook Salmon Table A2. Cumulative CPUE from the ATF.

Date	2018	2017	2016	2015
6/25	218	1,945	1,514	1,884
6/26	245	2,165	1,564	2,008
6/27	280	2,500	1,657	2,169
6/28	330	3,012	1,763	2,187
6/29		3,416	1,857	2,228
6/30		3,718	1,964	2,251
7/1		3,996	2,056	2,286
EOS		6,508	2,729	2,916

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

Timing	Midpoint	6/28 Cumulative %
Earliest	6/14	93%
Early 10%	6/17	87%
Early 25%	6/21	81%
Median	6/22	73%
Late 25%	6/24	62%
Late 10%	6/27	53%
Latest	7/3	41%

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Chum Salmon Appendix

Chum Salmon Table A1. Cumulative CPUE from the BTF.

Date	2018	2017	2016	2015	2014	5-Yr Avg.	2008 - 2017 Avg.
6/25	879	760	393	482	1,194	727	757
6/26	998	930	460	541	1,434	849	900
6/27	1,150	1,317	541	554	1,608	1,000	1,070
6/28	1,243	1,671	602	590	1,851	1,144	1,212
6/29		2,042	724	628	2,155	1,314	1,430
6/30		2,183	747	695	2,596	1,504	1,721
7/1		2,454	817	722	2,836	1,636	1,951
EOS		6,785	3,894	2,943	6,343	5,135	6,525

Chum Salmon Table A2. Cumulative CPUE from the ATF.

Date	2018	2017	2016	2015
6/25	401	1,214	456	467
6/26	561	1,494	563	649
6/27	928	1,696	649	772
6/28	1,276	1,966	958	810
6/29		2,165	1,124	877
6/30		2,221	1,318	944
7/1		2,629	1,769	969
EOS		11,588	5,304	5,669

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

Timing	Midpoint	6/28 Cumulative %
Earliest	6/23	57%
Early 10%	7/1	46%
Early 25%	7/2	35%
Median	7/5	25%
Late 25%	7/7	16%
Late 10%	7/11	10%
Latest	7/14	6%

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Sockeye Salmon Appendix

Sockeye Salmon Table A1. Cumulative CPUE from the BTF.

Date	2018	2017	2016	2015	2014	5-Yr Avg.	2008 - 2017 Avg.
6/25	126	341	142	236	286	293	349
6/26	184	373	236	292	303	339	399
6/27	204	456	279	316	338	384	449
6/28	217	504	291	393	452	448	500
6/29		614	319	499	498	509	566
6/30		692	437	713	585	620	664
7/1		793	547	873	697	724	753
EOS		2,690	2,463	2,157	1,367	1,965	1,711

Sockeye Salmon Table A2. Cumulative CPUE from the ATF.

Date	2018	2017	2016	2015
6/25	0	83	8	17
6/26	0	83	8	42
6/27	0	92	8	120
6/28	8	118	26	129
6/29		118	26	145
6/30		126	26	160
7/1		126	61	177
EOS		393	405	1,245

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

Timing	Midpoint	6/28 Cumulative %
Earliest	6/22	82%
Early 10%	6/24	72%
Early 25%	6/25	61%
Median	6/29	48%
Late 25%	7/1	35%
Late 10%	7/5	24%
Latest	7/10	15%

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