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: **7/21/2021** **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: **QUORUM MET? Yes / No**

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

Kuskokwim River In-season Harvest and Effort Estimates

7/16/2021 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@krtifc.org), Katie Russell (krussell@nativecouncil.org)

Special Action #: 3-KS-03-21

Special Action: https://www.fws.gov/uploadedFiles/3-KS-03-21_Final_7.1.2021.pdf?fbclid=IwAR2tAlnoL7tVqfm3s40yFia6NXPVI9yalYMCrY6-fm4BGfZDt98c4e7a8Lg

Data Sources

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

Data Source	Interviews	Percent
Bethel Boat Harbor (ONC)	55	75%
Bethel Area Fish Camps (ONC)	12	16%
Other Villages (BSFA/KRITFC)	6	8%
Total	**73**	**100%**

Of these interviews, **68** were from drift nets and **5** 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**
3:45 PM	4:50 PM	1.08	101	4

Effort Estimates

- An estimated **189** total drift boat trips occurred.
  - Since only one flight was conducted, the counts did not need to be corrected for double counts.
  - An estimated **87** trips were not counted during any flight.
- An estimated **4** total set net trips occurred.

Harvest Estimates

- An estimated total of **3,580 (3,030 – 4,200)** salmon were harvested.
  - An estimated total of **240 (180 – 320)** Chinook salmon were harvested.
  - An estimated total of **520 (350 – 720)** chum salmon were harvested.
  - An estimated total of **2,830 (2,360 – 3,330)** sockeye salmon were harvested.
- Harvest by set nets accounted for an estimated **100 (60 – 140)** total salmon (0% Chinook salmon, 0% chum salmon, and 100% sockeye salmon).

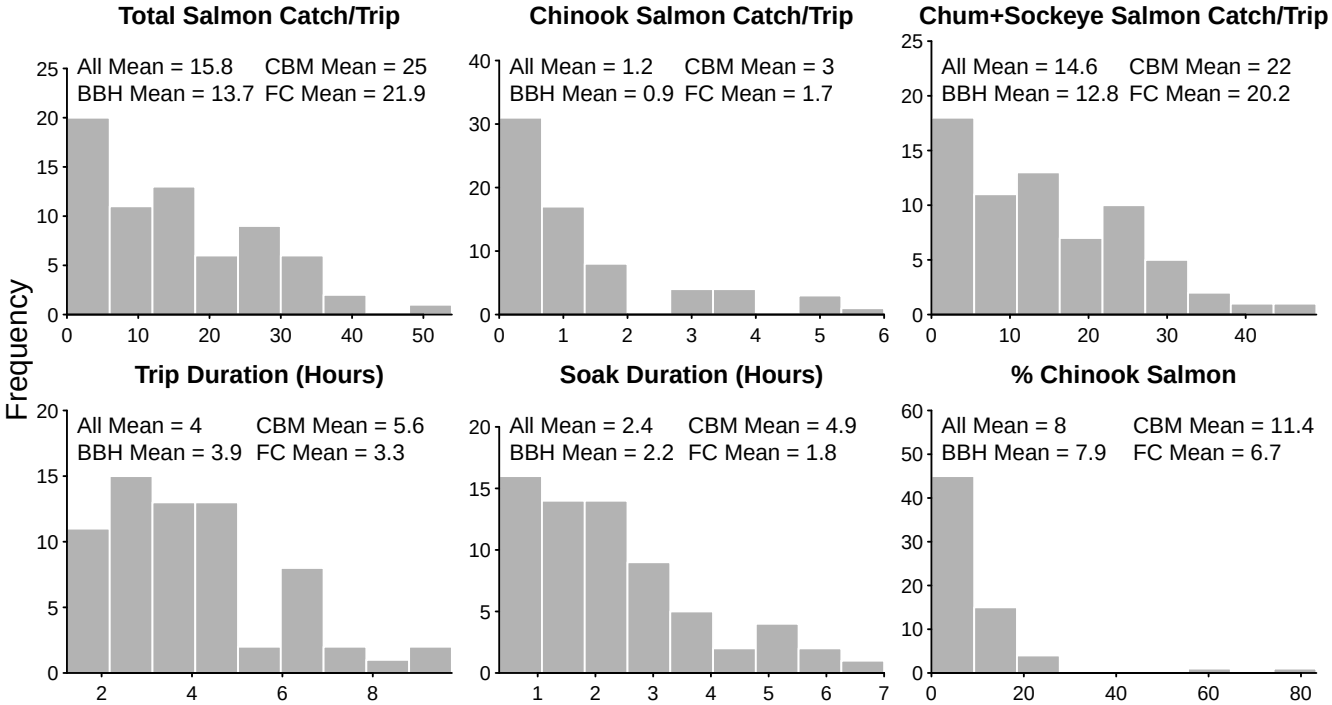
TABLE 3. Summary of relevant quantities by river stratum (area) for drift nets. Numbers in parentheses are 95% confidence intervals.

			Estimated Harvest			
Stratum	**Interviews**	**Effort Est.**	**Chinook**	**Chum**	**Sockeye**	**Total**
Tuntutuliak ⟷ Johnson R.	2	32	30 (0 – 60)	100 (30 – 180)	440 (240 – 640)	**560 (300 – 840)**
Johnson R. ⟷ Napaskiak	7	37	50 (30 – 80)	100 (60 – 160)	560 (430 – 710)	**720 (560 – 880)**
Napaskiak ⟷ Akiachak	57	101	140 (80 – 200)	270 (130 – 440)	1,460 (1,080 – 1,920)	**1,860 (1,400 – 2,360)**
Akiachak ⟷ Akiak	0	19	30 (20 – 40)	50 (20 – 80)	280 (200 – 360)	**350 (270 – 450)**
All	**66**	**189**	**240 (180 – 320)**	**510 (350 – 710)**	**2,730 (2,260 – 3,230)**	**3,490 (2,930 – 4,100)**

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.

	Proximity to Johnson R. Mouth	
Quantity	**Downstream**	**Upstream**
Total Catch/Trip	17 (9 – 26)	19 (15 – 22)
% Chinook Salmon	4% (1% – 9%)	7% (5% – 10%)

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.	2	0	0	0	0	0
Johnson R. ⟷ Napaskiak	6	0	0.1	0.4	0.6	0.7
Napaskiak ⟷ Akiachak	54	0	0	0.7	1	5
All	**62**	**0**	**0**	**0.6**	**0.7**	**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.	2	0	0	0	0	0
Johnson R. ⟷ Napaskiak	7	0	1	2	4	6
Napaskiak ⟷ Akiachak	57	0	0	1	2	5
All	**66**	**0**	**0**	**1**	**2**	**6**

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.	2	0	0.6	1.2	1.8	2.4
Johnson R. ⟷ Napaskiak	6	3.8	4.7	6.6	9.2	11
Napaskiak ⟷ Akiachak	54	0	3.1	8.3	11.5	42
All	**62**	**0**	**3.1**	**7.9**	**10.5**	**42**

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.	2	0	1	2	2	3
Johnson R. ⟷ Napaskiak	7	10	18	22	26	33
Napaskiak ⟷ Akiachak	57	0	5	14	24	49
All	**66**	**0**	**5**	**15**	**24**	**49**

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

Area	N	Min	25%	Mean	75%	Max
Tuntutuliak ⟷ Johnson R.	2	0%	0%	0%	0%	0%
Johnson R. ⟷ Napaskiak	7	0%	4%	9%	12%	15%
Napaskiak ⟷ Akiachak	57	0%	0%	8%	12%	83%
All	**66**	**0%**	**0%**	**8%**	**12%**	**83%**

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

Area	N	Min	25%	Mean	75%	Max
Tuntutuliak ⟷ Johnson R.	2	1.2	1.4	1.6	1.8	2
Johnson R. ⟷ Napaskiak	6	2	2.5	4	5.4	6
Napaskiak ⟷ Akiachak	54	0.3	1.3	2.2	3	6
All	**62**	**0.3**	**1.4**	**2.4**	**3**	**6**

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

Area	N	Min	25%	Mean	75%	Max
Tuntutuliak ⟷ Johnson R.	2	2.5	2.6	2.8	2.9	3
Johnson R. ⟷ Napaskiak	7	2	3.5	5.1	6.5	8
Napaskiak ⟷ Akiachak	57	1.2	2.5	3.9	5	9.8
All	**66**	**1.2**	**2.5**	**4**	**5**	**9.8**

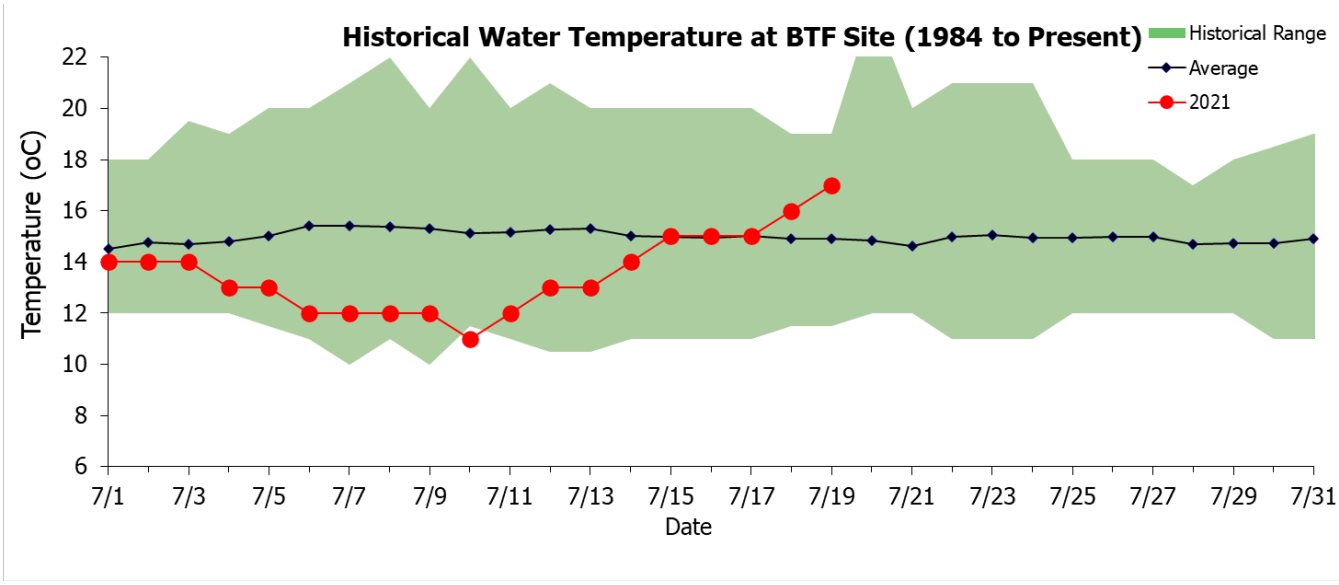
TABLE A8. Summary of drift net trip start time by fishing area.

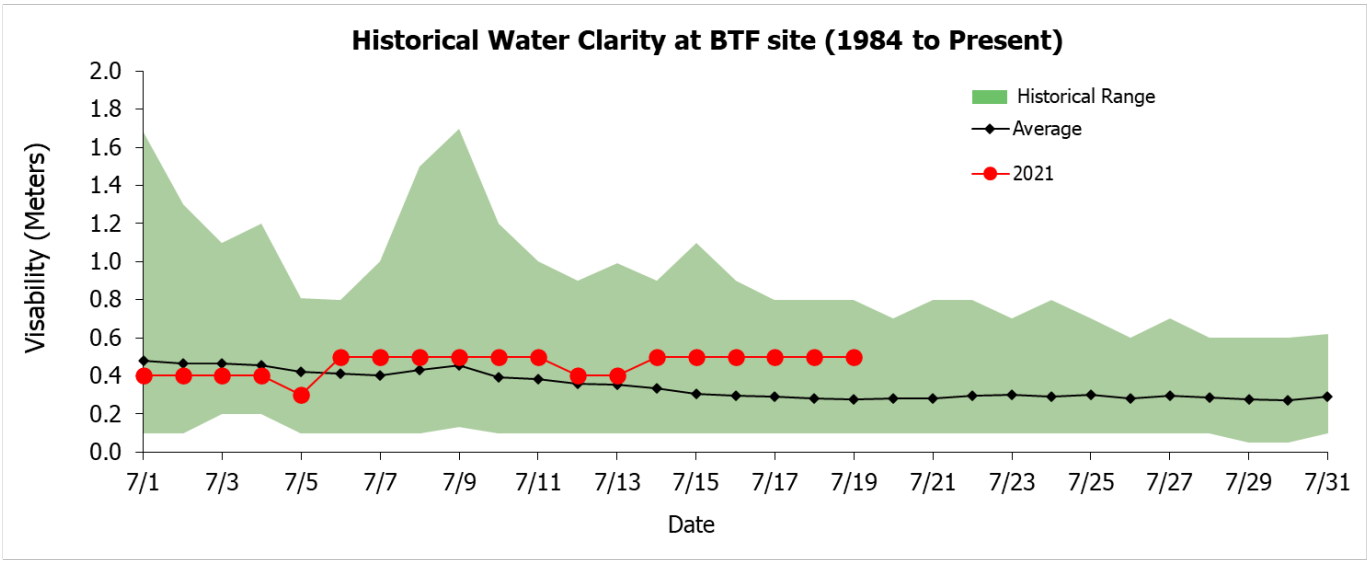
Area	N	Min	25%	Mean	75%	Max
Tuntutuliak ⟷ Johnson R.	2	1:00 PM	1:41 PM	2:22 PM	3:03 PM	3:45 PM
Johnson R. ⟷ Napaskiak	7	7:00 AM	8:00 AM	10:12 AM	12:00 PM	3:00 PM
Napaskiak ⟷ Akiachak	57	6:00 AM	9:00 AM	11:50 AM	2:00 PM	5:00 PM
All	**66**	**6:00 AM**	**9:00 AM**	**11:44 AM**	**2:00 PM**	**5:00 PM**

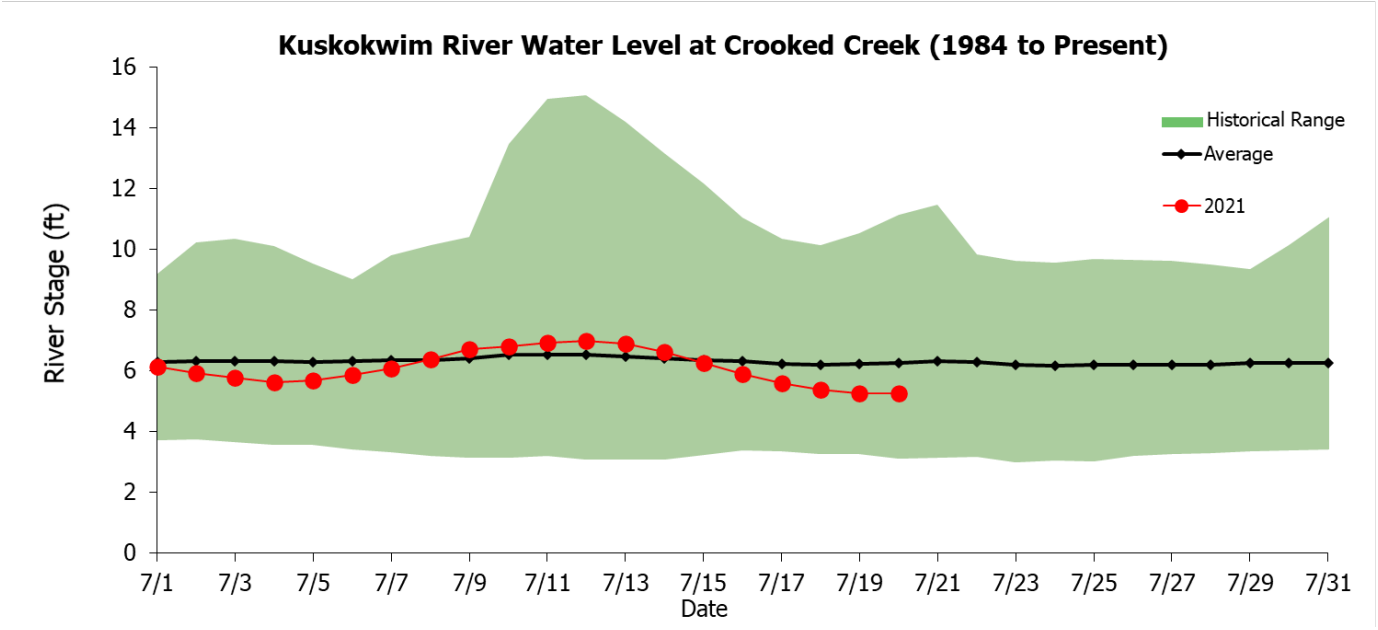
TABLE A9. Summary of drift net trip end time by fishing area.

Area	N	Min	25%	Mean	75%	Max
Tuntutuliak ⟷ Johnson R.	2	3:30 PM	4:18 PM	5:07 PM	5:56 PM	6:45 PM
Johnson R. ⟷ Napaskiak	7	1:00 PM	2:30 PM	3:21 PM	4:00 PM	6:30 PM
Napaskiak ⟷ Akiachak	57	10:17 AM	2:25 PM	3:43 PM	5:48 PM	6:45 PM
All	**66**	**10:17 AM**	**2:30 PM**	**3:43 PM**	**5:45 PM**	**6:45 PM**

Weather summary at BTF as of 7/19







Kuskokwim River Salmon Assessment Update
7/19/2021

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

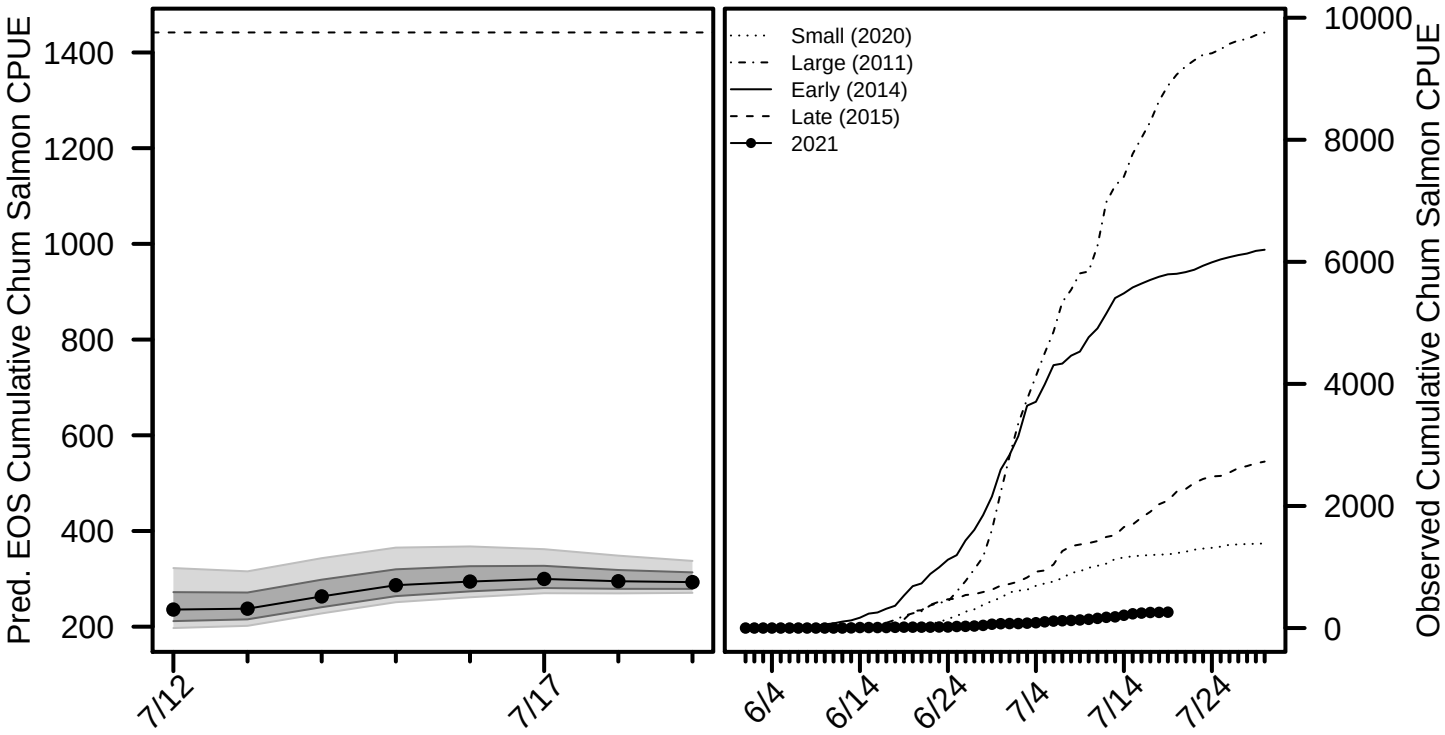
For the most up-to-date information regarding fishing opportunities please visit:

- **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

Chum Salmon BTF Summary (7/19)

- The BTF daily CPUE was **3**.
- The BTF cumulative CPUE is now **260**.
- **0%** years since 2008 fell below this cumulative CPUE on this date.
- **89%** of the run is complete based on historical average run timing.
- **83% - 93%** of the run is complete based the central 50% of all historical run timing scenarios.
- **4% - 8%** of the run is expected to pass Bethel in the next 5 days.
- Over the last 3 days, chum salmon made up **27%** of the BTF catches, compared to **80%** on average.

Chum 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 2020. *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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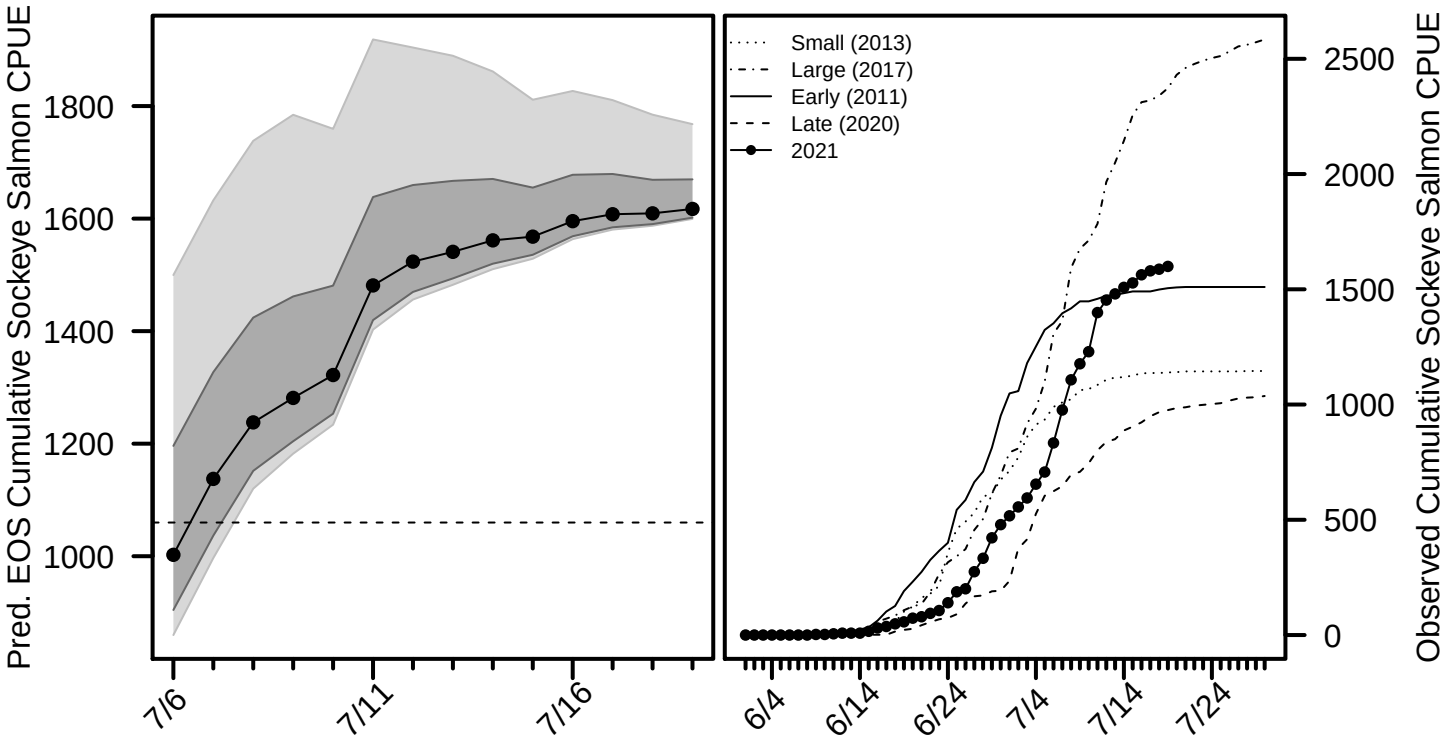
Sockeye Salmon BTF Summary (7/19)

- The BTF daily CPUE was **12**.
- The BTF cumulative CPUE is now **1,599**.
- **54%** years since 2008 fell below this cumulative CPUE on this date.
- **99%** of the run is complete based on historical average run timing.
- **96% - 100%** of the run is complete based the central 50% of all historical run timing scenarios.
- **0% - 2%** of the run is expected to pass Bethel in the next 5 days.
- Over the last 3 days, sockeye salmon made up **64%** of the BTF catches, compared to **9%** on average.

Sockeye 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 2020. *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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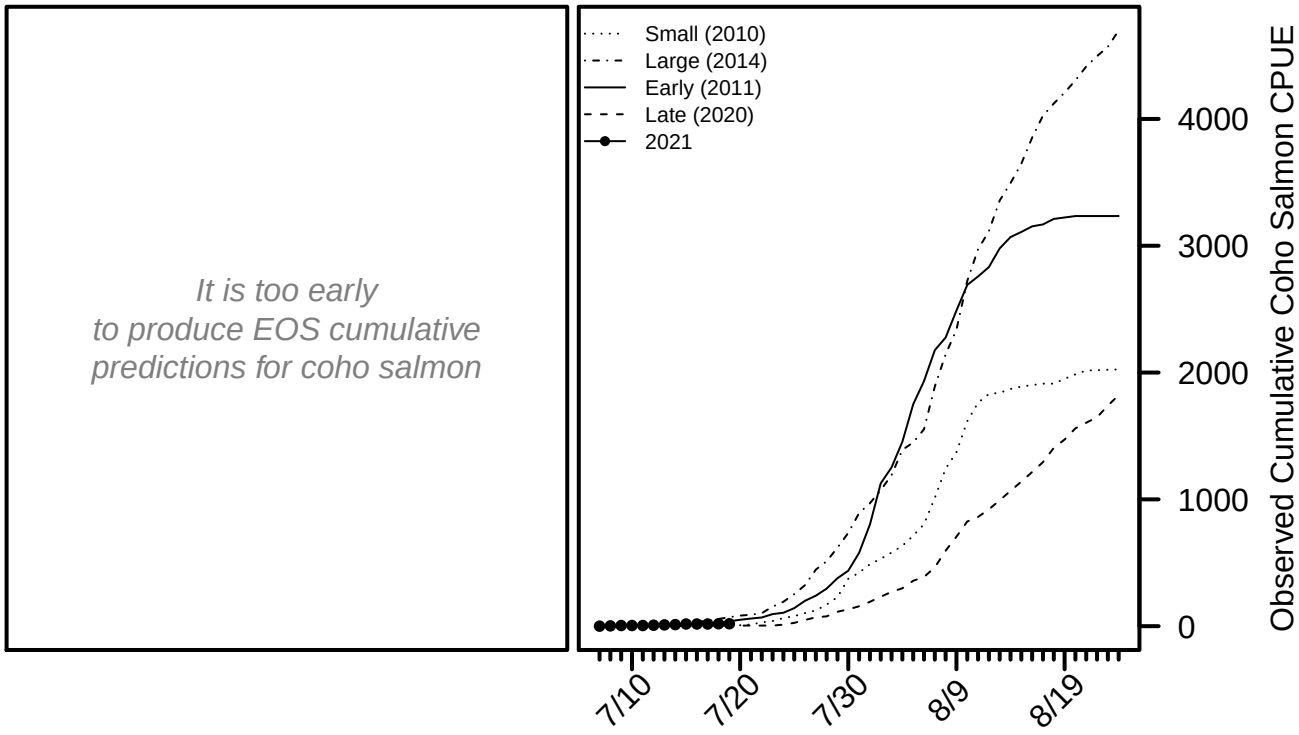
Coho Salmon BTF Summary (7/19)

- The BTF daily CPUE was **0**.
- The BTF cumulative CPUE is now **19**.
- **54%** years since 2008 fell below this cumulative CPUE on this date.
- **1%** of the run is complete based on historical average run timing.
- **<1% - 1%** of the run is complete based the central 50% of all historical run timing scenarios.
- **1% - 4%** of the run is expected to pass Bethel in the next 5 days.
- Over the last 3 days, coho salmon made up **3%** of the BTF catches, compared to **8%** on average.

Coho 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 ***coho salmon appendix*** *at the end of this document.*

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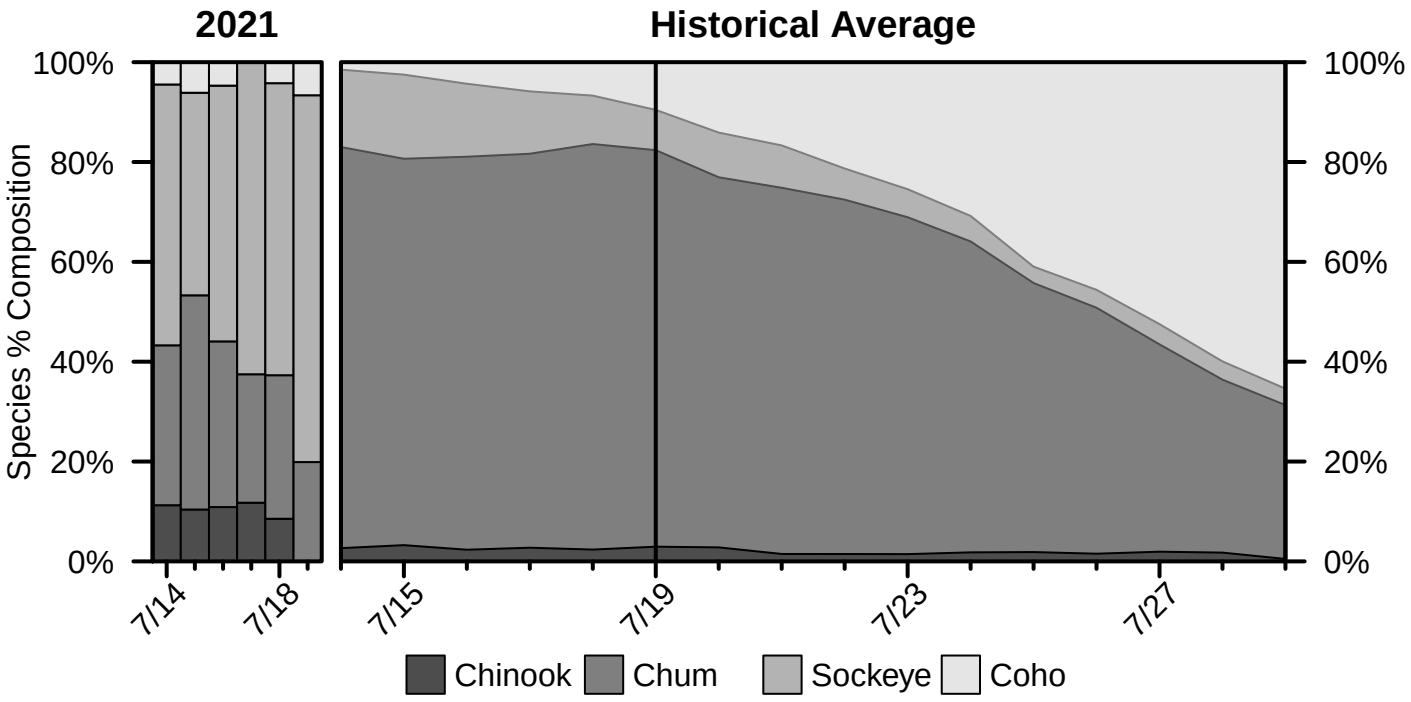
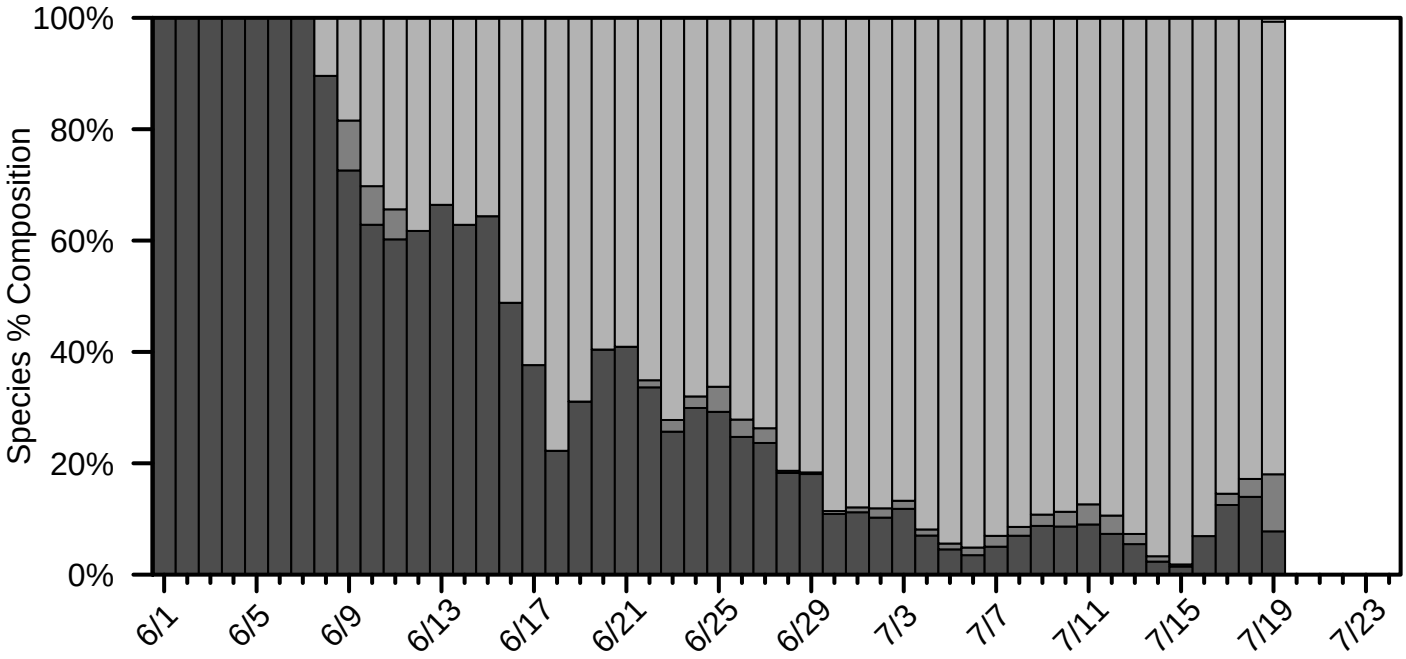
Percent Composition by Salmon Species

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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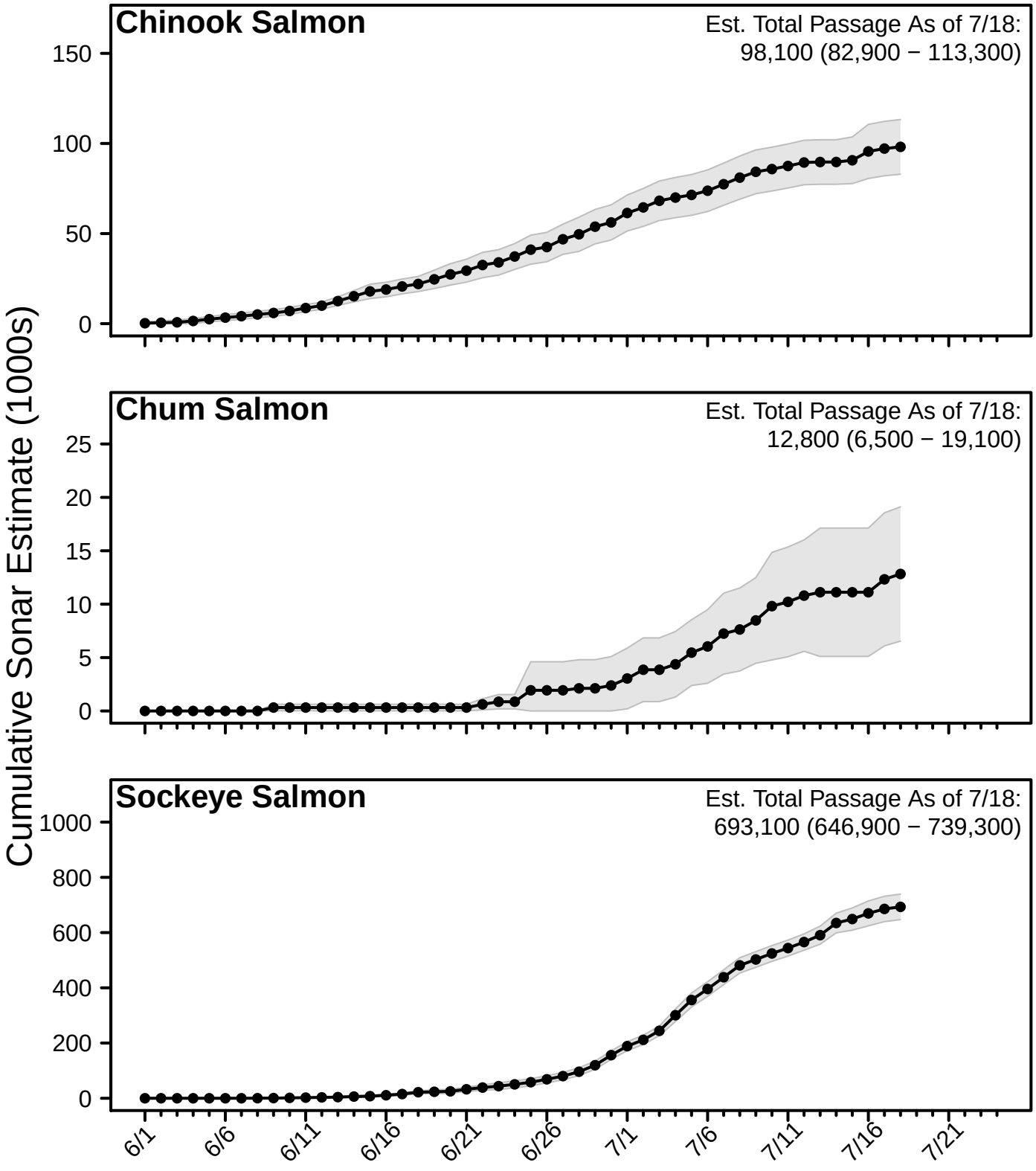
Sonar Passage Estimates

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
6/28	2,980	19,990	0.06	0.04
7/2	1,330	21,320	0.09	0.03
7/16	240	21,560	0.15	0.03

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	0.65
6/9	0	20	0	0.65
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
6/28	960	2,390	0.1	0.09
7/2	1,150	3,540	0.15	0.08
7/16	520	4,060	0.18	0.07

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
6/28	6,880	11,090	0.07	0.05
7/2	8,990	20,080	0.07	0.04
7/16	2,830	22,910	0.09	0.04

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Chinook Salmon Appendix

*** The BTF daily CPUE was **0** (cumulative: **530**).

*** The table below shows cumulative CPUE from the BTF from 2021 and in previous years.

Date	2021	2020	2019	2018	2017	5-Yr Avg.	2008 - 2020 Avg.
7/16	526	469	828	640	345	587	547
7/17	530	474	830	643	345	589	549
7/18	530	476	833	648	350	593	553
7/19	**530**	**478**	**833**	**648**	**356**	**596**	**555**
EOS		487	848	667	374	613	568

*** If the run ended on 7/19, 50% of the run would have passed BTF on **6/25**, which is **2 days later** than average.

*** The ATF ended operations on 7/13 with an EOS cumulative CPUE value of 1,891 for Chinook salmon, which is below the 2016-2020 average EOS cumulative CPUE of 2,664.

*** The cumulative Chinook salmon passage (95% CI) at the sonar, as of **7/18**, is **98,100 (82,900 - 113,300)** fish.

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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.
7/16	245	1,187	3,336	6,794	5,775	3,970	4,858
7/17	255	1,196	3,683	7,046	5,944	4,161	5,003
7/18	256	1,203	3,985	7,220	6,056	4,303	5,166
7/19	**260**	**1,206**	**4,170**	**7,259**	**6,213**	**4,407**	**5,285**
7/20		1,228	4,382	7,270	6,239	4,483	5,379
7/21		1,250	4,505	7,312	6,281	4,535	5,469
7/22		1,284	4,734	7,393	6,326	4,628	5,576
EOS		1,442	6,427	8,212	6,785	5,352	6,256

Chum Salmon Table A2. Percent of run complete according to various historical run timing scenarios from the BTF.

Timing	Midpoint	7/19 Cumulative %
Earliest	6/23	98%
Early 10%	7/1	96%
Early 25%	7/3	93%
Median	7/6	89%
Late 25%	7/8	83%
Late 10%	7/11	77%
Latest	7/15	69%

The ATF ended operations on 7/13 with an EOS cumulative CPUE value of 267 for chum salmon, which is below the 2016-2020 average EOS cumulative CPUE of 5,477.

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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.
7/16	1,563	923	2,070	1,724	2,312	1,754	1,549
7/17	1,580	949	2,156	1,795	2,320	1,802	1,577
7/18	1,587	967	2,217	1,841	2,340	1,837	1,597
7/19	**1,599**	**976**	**2,283**	**1,909**	**2,373**	**1,880**	**1,619**
7/20		985	2,337	1,924	2,431	1,916	1,636
7/21		988	2,385	1,933	2,460	1,939	1,648
7/22		995	2,427	1,950	2,477	1,966	1,661
EOS		1,060	2,685	2,275	2,690	2,234	1,779

Sockeye Salmon Table A2. Percent of run complete according to various historical run timing scenarios from the BTF.

Timing	Midpoint	7/19 Cumulative %
Earliest	6/22	100%
Early 10%	6/24	100%
Early 25%	6/27	100%
Median	6/29	99%
Late 25%	7/2	96%
Late 10%	7/6	90%
Latest	7/10	81%

The ATF ended operations on 7/13 with an EOS cumulative CPUE value of 241 for sockeye salmon, which is above the 2017-2020 average EOS cumulative CPUE of 159.

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Coho Salmon Appendix

Coho Salmon Table A1. Cumulative CPUE from the BTF.

Date	2021	2020	2019	2018	2017	5-Yr Avg.	2008 - 2020 Avg.
7/16	17	5	5	0	4	4	13
7/17	17	5	5	0	4	5	17
7/18	19	5	5	0	4	6	22
7/19	**19**	**5**	**5**	**0**	**9**	**8**	**31**
7/20		5	13	0	12	11	41
7/21		5	19	0	19	14	55
7/22		5	31	2	33	26	81
EOS		1,822	1,801	901	3,245	2,260	3,017

Coho Salmon Table A2. Percent of run complete according to various historical run timing scenarios from the BTF.

Timing	Midpoint	7/19 Cumulative %
Earliest	7/29	4%
Early 10%	8/4	3%
Early 25%	8/6	1%
Median	8/8	1%
Late 25%	8/11	<1%
Late 10%	8/13	<1%
Latest	8/15	<1%

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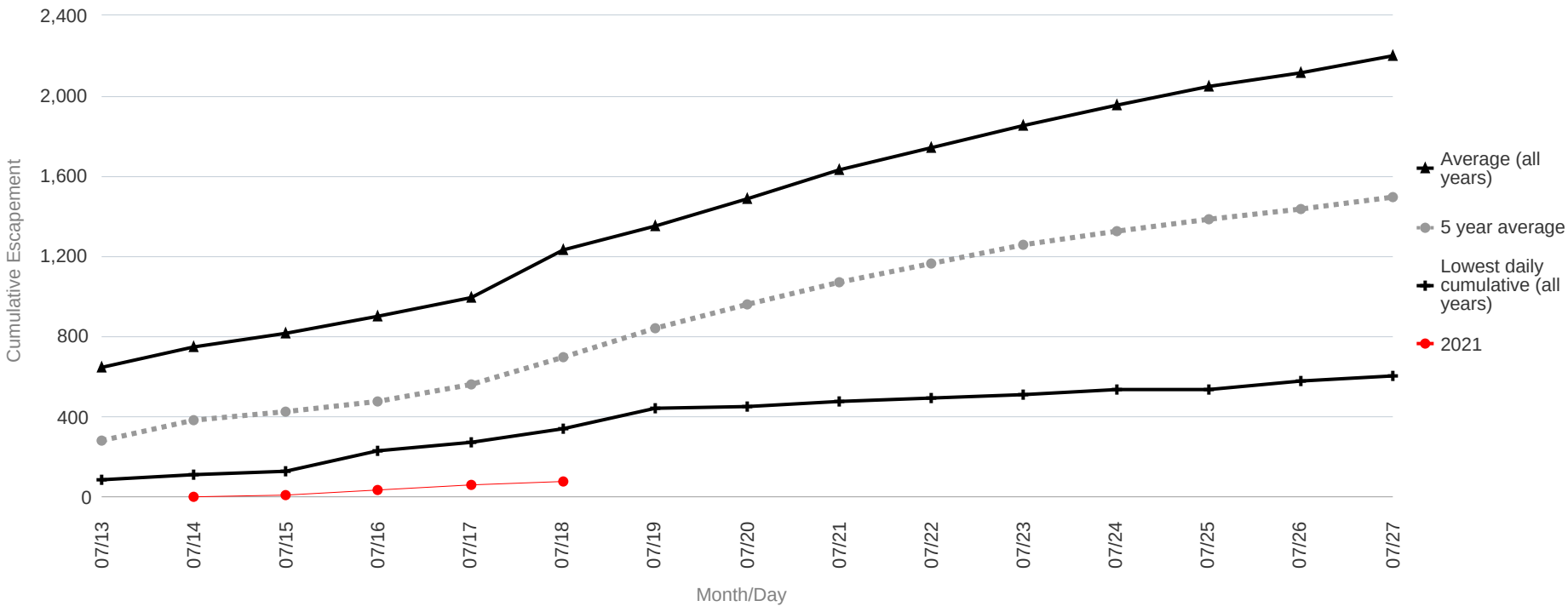
Salmon River (Aniak) Salmon Monitoring Project
Passage of Chinook Salmon

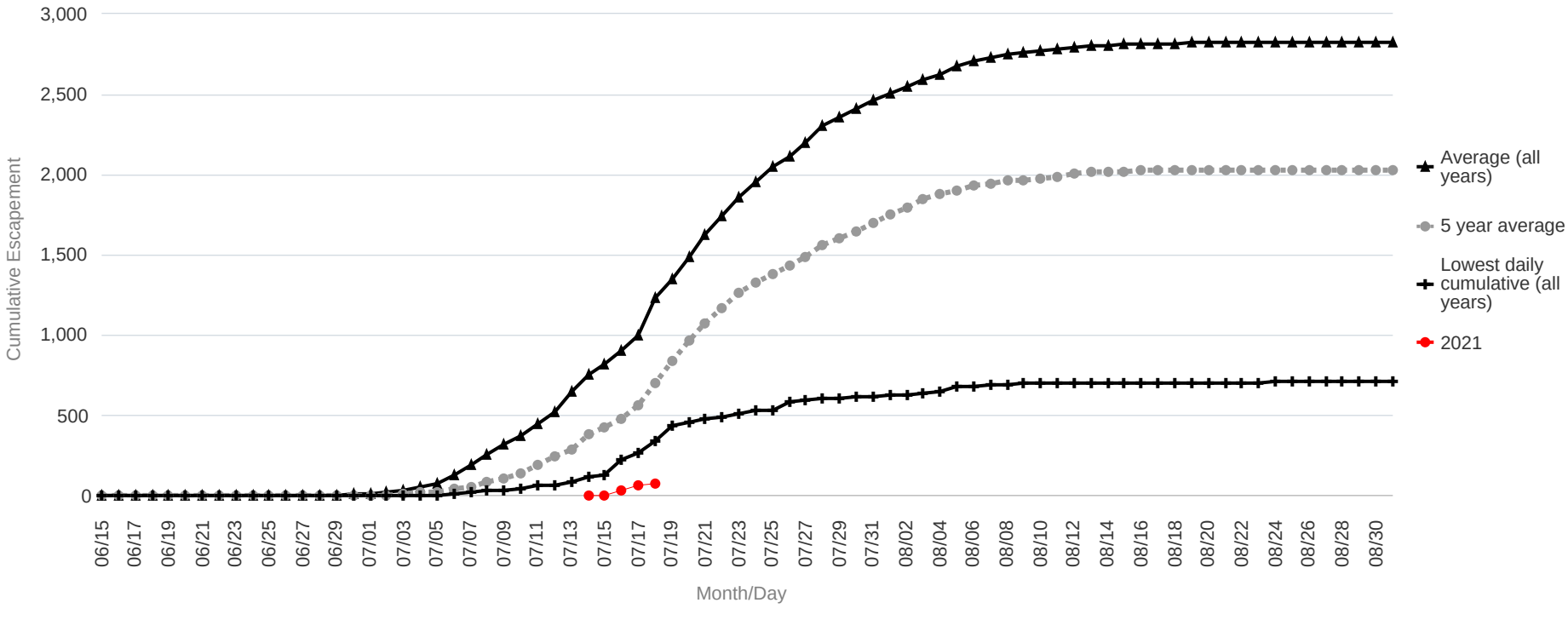
Date	Lowest daily cumulative (all years)	Average (all years)	5 year average	2021
07/13	85	646	284	
07/14	114	752	386	0
07/15	128	818	427	6
07/16	229	902	479	36
07/17	269	998	565	61
07/18	342	1,233	697	75
07/19	440	1,349	842	
07/20	455	1,486	965	
07/21	476	1,629	1,069	
07/22	491	1,745	1,165	
07/23	512	1,854	1,259	
07/24	534	1,950	1,326	
07/25	537	2,047	1,383	
07/26	583	2,116	1,438	
07/27	600	2,199	1,492	

	Lowest Count	Average Count	5 Year Average
Season Total	711	2,824	2,030

Focused Two-Week Data View



Season Total Overview



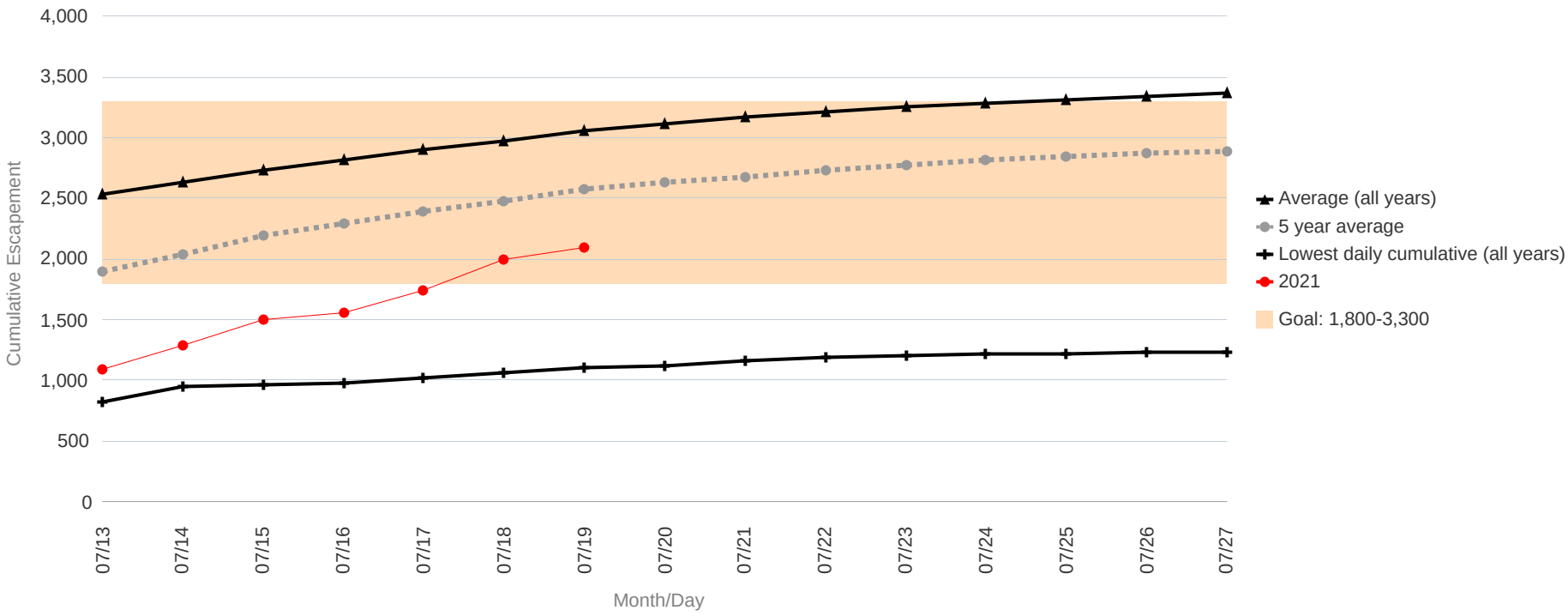
George River Salmon Monitoring Project
Cumulative Daily Passage of Chinook Salmon

Escapement Goal Range: 1,800 to 3,300

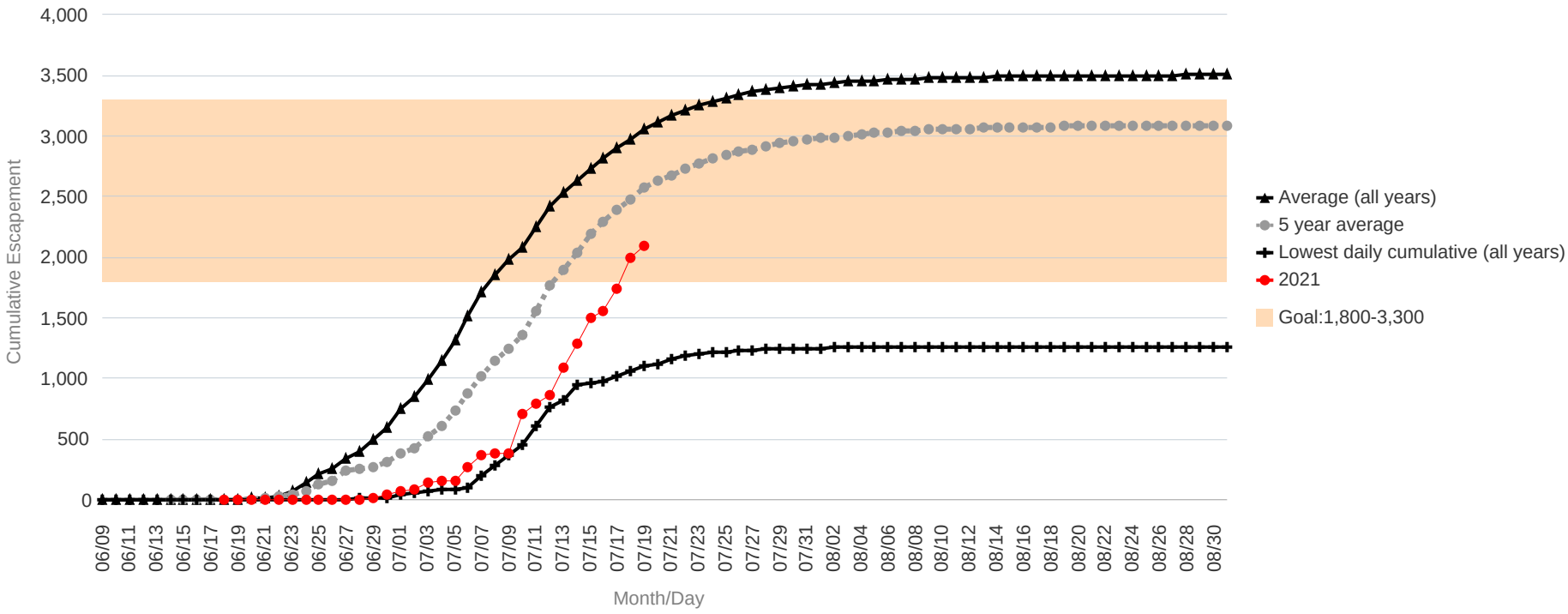
Date	Lowest daily cumulative (all years)	Average (all years)	5 year average	2021
07/13	820	2,537	1,905	1,090
07/14	944	2,637	2,045	1,290
07/15	960	2,737	2,189	1,506
07/16	985	2,824	2,299	1,559
07/17	1,017	2,903	2,392	1,743
07/18	1,065	2,970	2,478	1,991
07/19	1,101	3,052	2,574	2,092
07/20	1,127	3,113	2,627	
07/21	1,168	3,177	2,675	
07/22	1,189	3,215	2,728	
07/23	1,205	3,260	2,775	
07/24	1,215	3,291	2,819	
07/25	1,226	3,320	2,843	
07/26	1,235	3,342	2,868	
07/27	1,239	3,365	2,894	

	Lowest Count	Average Count	5 Year Average
Season Total	1,267	3,506	3,091

Focused Two-Week Data View



Season Total Overview



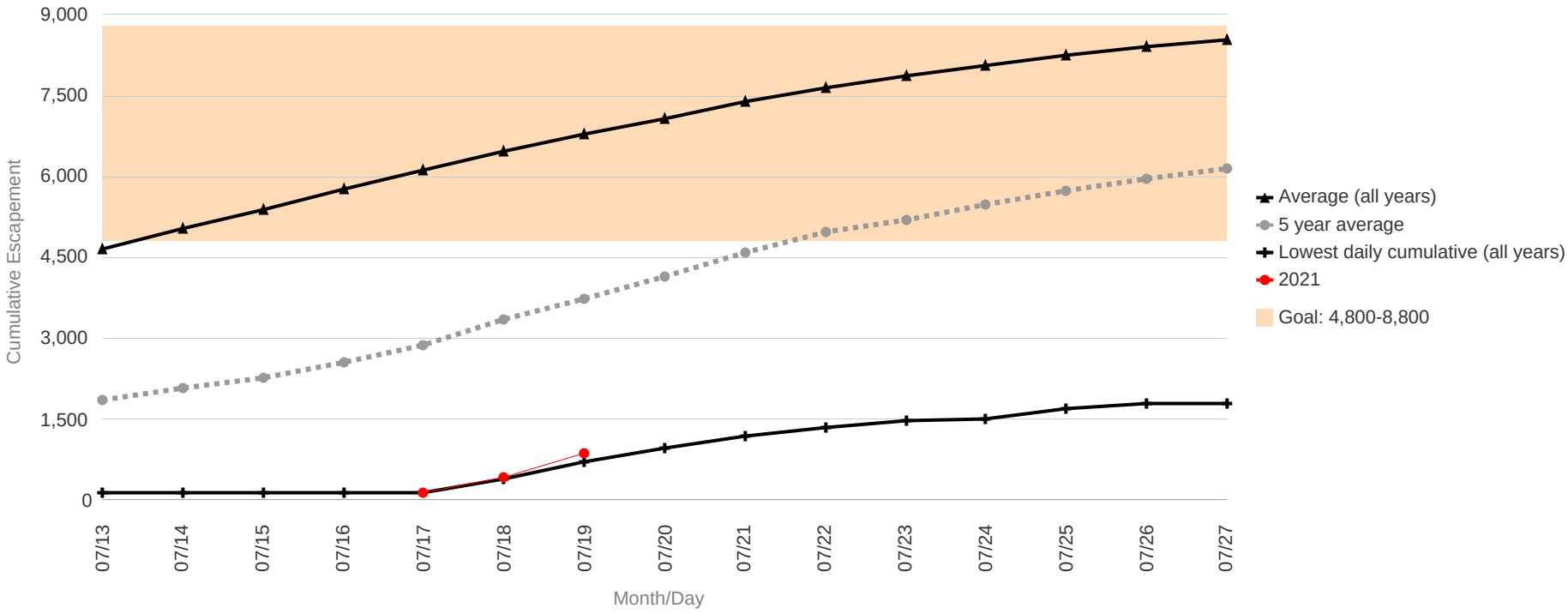
Kogrukluk River Salmon Monitoring Project
Cumulative Daily Passage of Chinook Salmon

Escapement Goal Range: 4,800 to 8,800

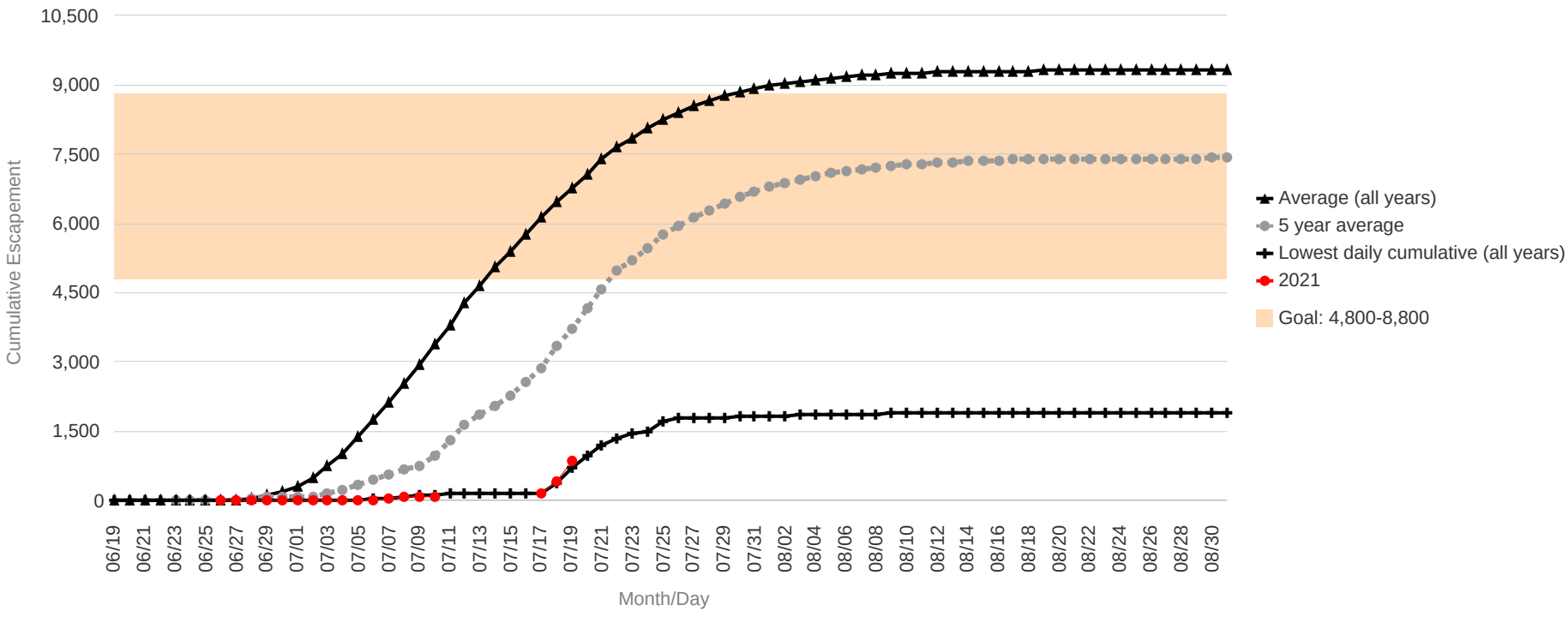
Date	Lowest daily cumulative (all years)	Average (all years)	5 year average	2021
07/13	145	4,655	1,863	
07/14	145	5,051	2,066	
07/15	145	5,385	2,266	
07/16	145	5,765	2,557	
07/17	145	6,122	2,860	139
07/18	374	6,462	3,360	430
07/19	703	6,774	3,726	874
07/20	967	7,071	4,157	
07/21	1,192	7,391	4,575	
07/22	1,354	7,650	4,974	
07/23	1,467	7,856	5,193	
07/24	1,507	8,051	5,477	
07/25	1,705	8,250	5,746	
07/26	1,775	8,402	5,944	
07/27	1,794	8,542	6,137	

	Lowest Count	Average Count	5 Year Average
Season Total	1,919	9,334	7,420

Focused Two-Week Data View



Season Total Overview

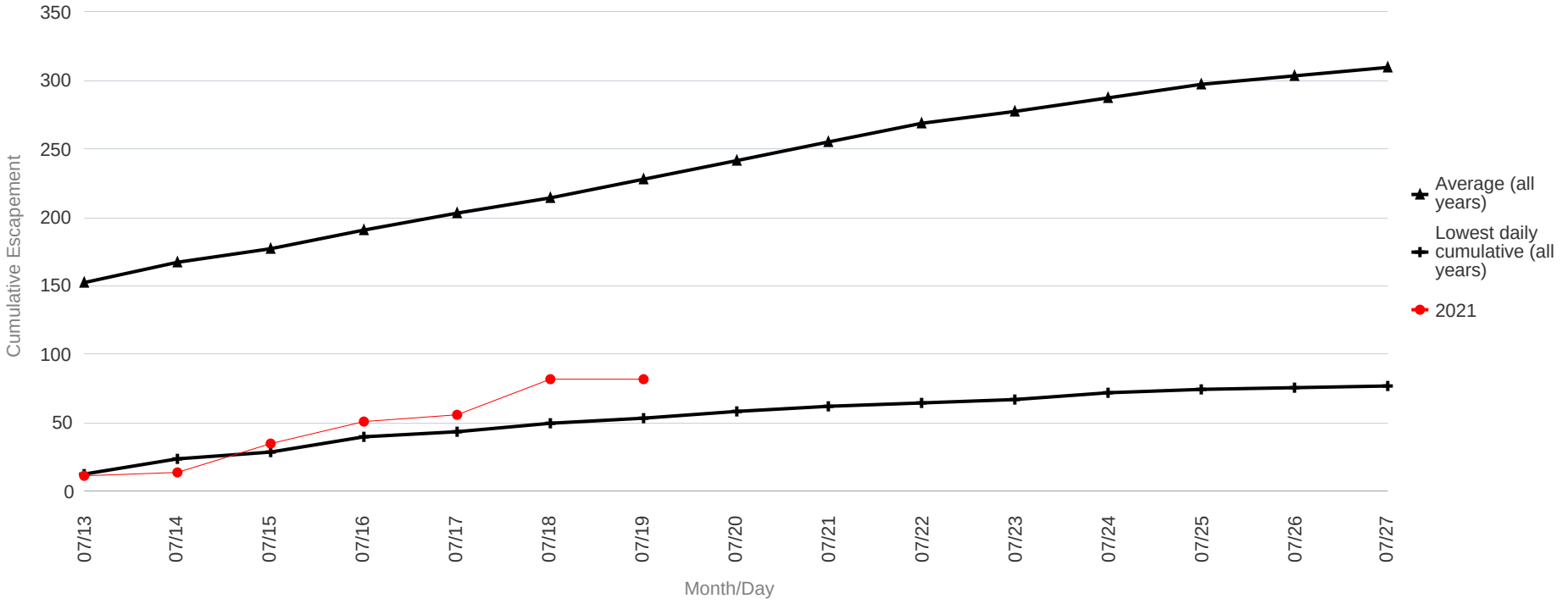


Takotna River Salmon Monitoring Project
Passage of Chinook Salmon

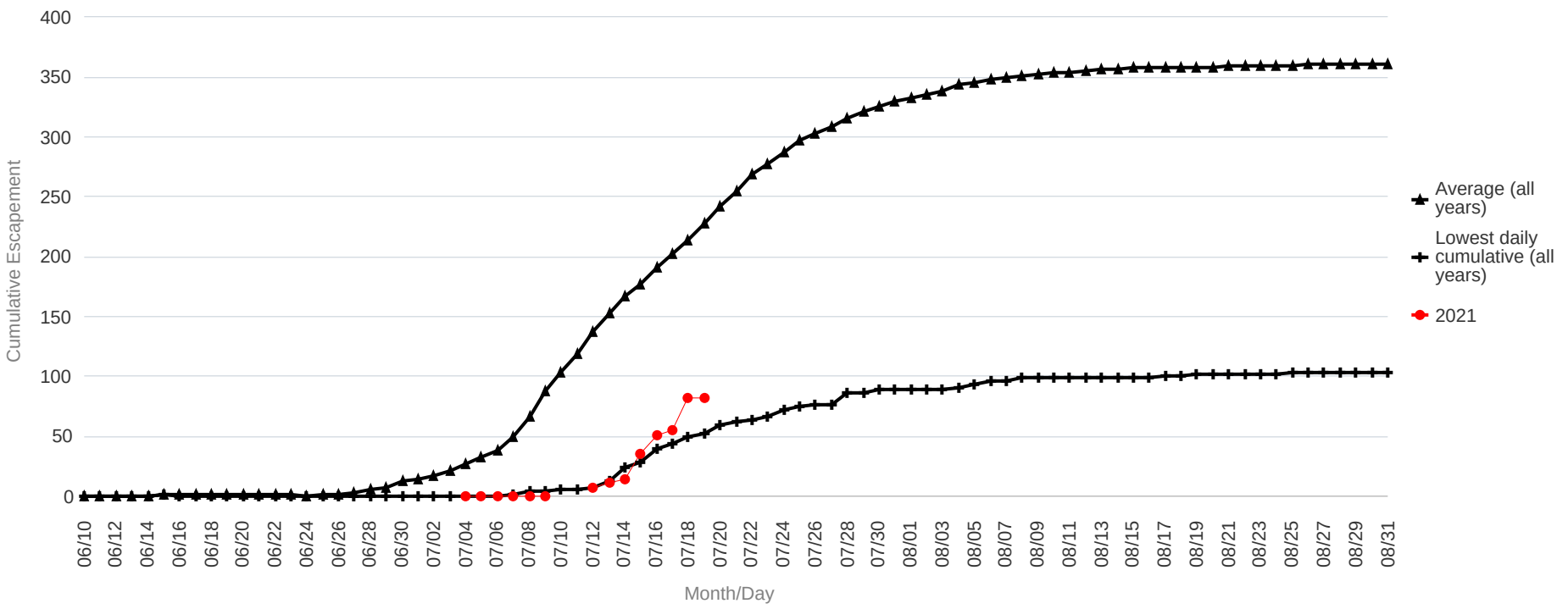
Date	Lowest daily cumulative (all years)	Average (all years)	2021
07/13	13	153	11
07/14	24	167	14
07/15	29	177	35
07/16	40	191	51
07/17	44	203	56
07/18	50	214	82
07/19	53	228	82
07/20	59	242	
07/21	62	256	
07/22	64	269	
07/23	67	278	
07/24	72	287	
07/25	75	297	
07/26	76	303	
07/27	77	309	

	Lowest Count	Average Count
Season Total	104	362

Focused Two-Week Data View



Season Total Overview

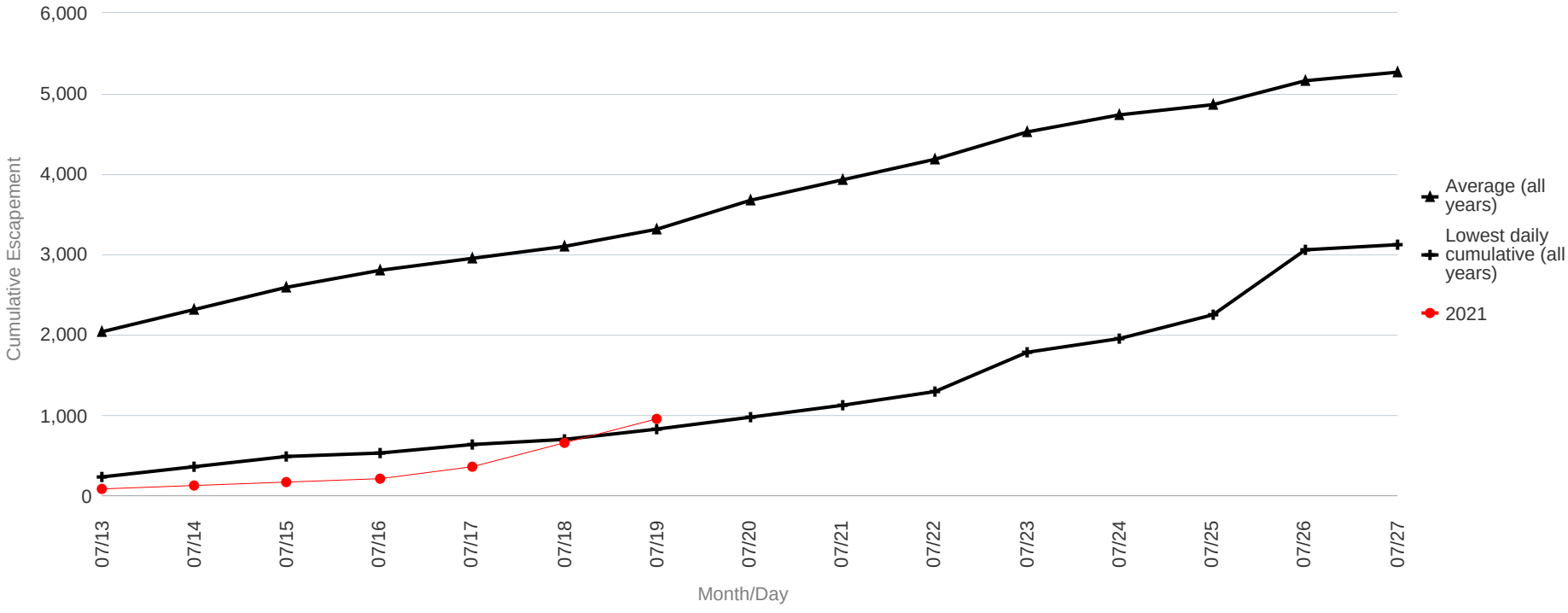


Salmon River (Pitka Fork) Salmon Monitoring Project
Passage of Chinook Salmon

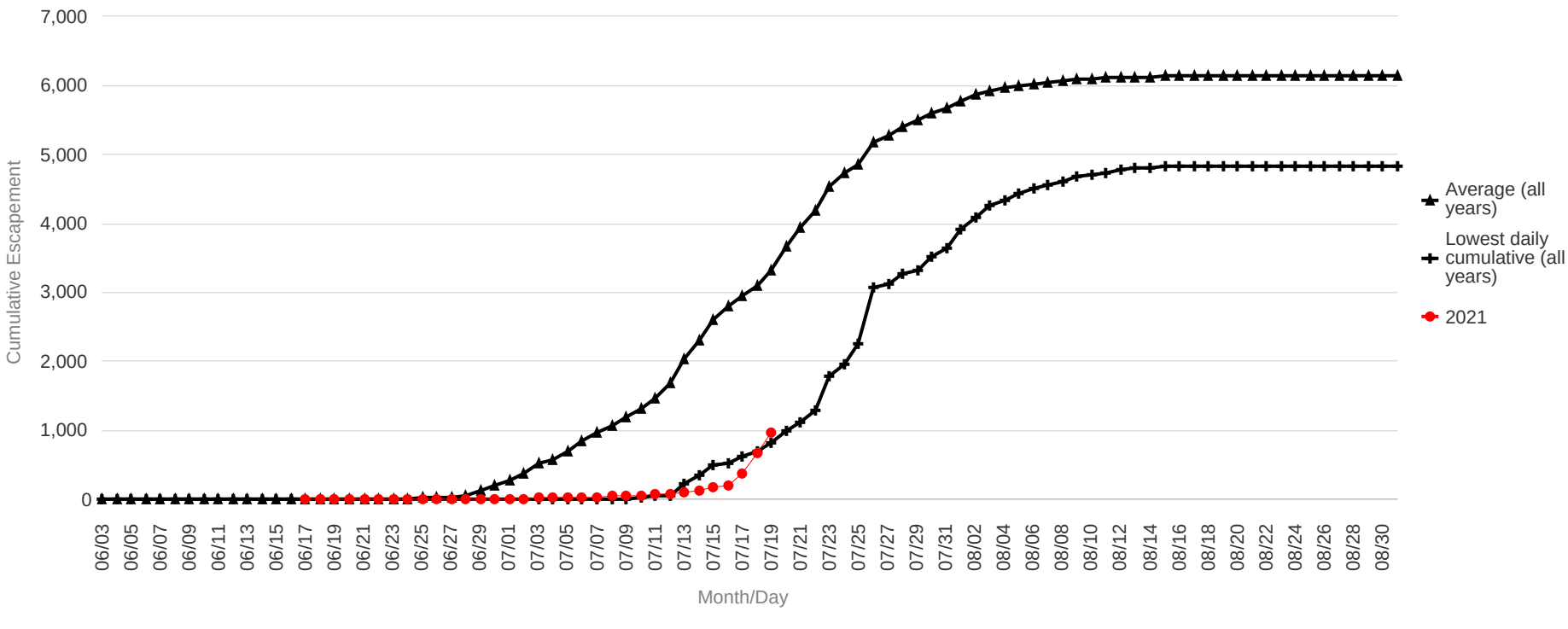
Date	Lowest daily cumulative (all years)	Average (all years)	2021
07/13	237	2,043	99
07/14	359	2,319	130
07/15	489	2,595	179
07/16	535	2,804	212
07/17	633	2,950	374
07/18	697	3,100	662
07/19	824	3,323	965
07/20	983	3,673	
07/21	1,120	3,931	
07/22	1,291	4,191	
07/23	1,789	4,526	
07/24	1,962	4,744	
07/25	2,253	4,861	
07/26	3,069	5,167	
07/27	3,116	5,272	

	Lowest Count	Average Count
Season Total	4,827	6,151

Focused Two-Week Data View



Season Total Overview

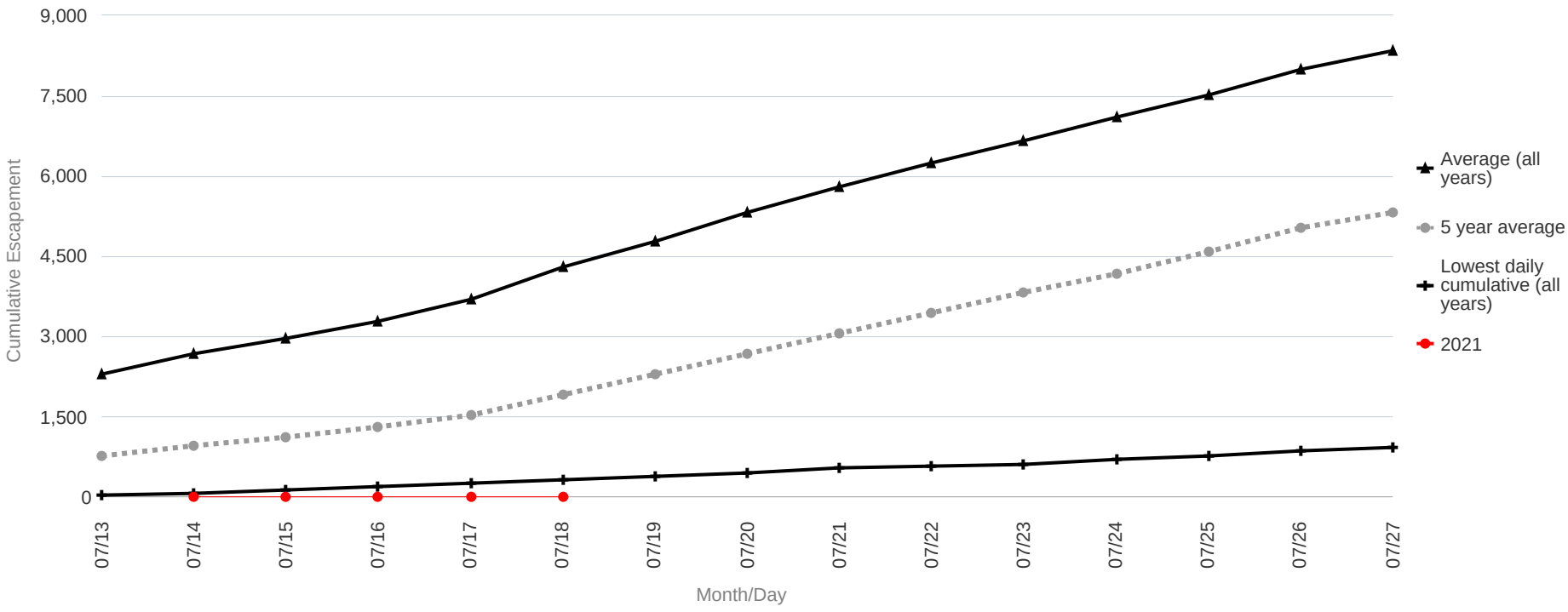


Salmon River (Aniak) Salmon Monitoring Project
Passage of Chum Salmon

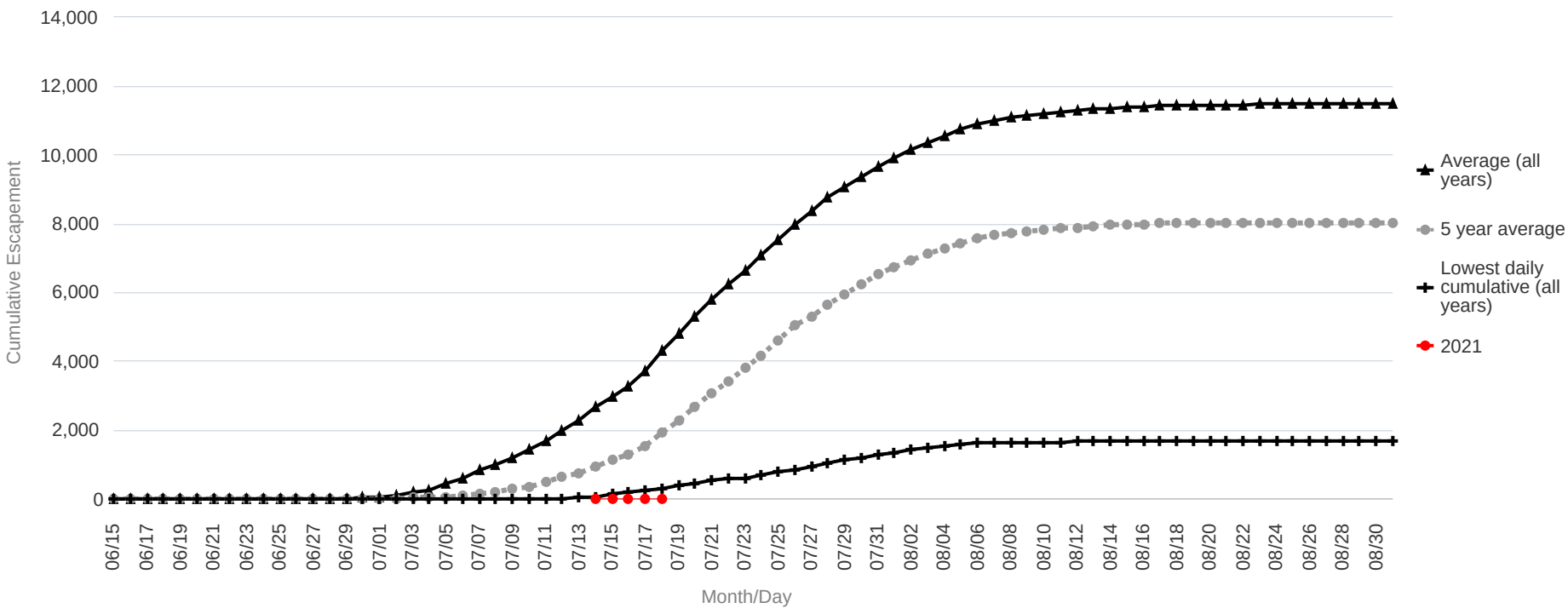
Date	Lowest daily cumulative (all years)	Average (all years)	5 year average	2021
07/13	39	2,307	775	
07/14	83	2,666	948	0
07/15	135	2,978	1,126	0
07/16	183	3,271	1,297	6
07/17	253	3,710	1,521	15
07/18	325	4,317	1,917	20
07/19	392	4,794	2,302	
07/20	463	5,328	2,679	
07/21	532	5,815	3,057	
07/22	587	6,246	3,440	
07/23	626	6,668	3,817	
07/24	698	7,113	4,190	
07/25	781	7,525	4,605	
07/26	866	8,001	5,038	
07/27	940	8,360	5,324	

	Lowest Count	Average Count	5 Year Average
Season Total	1,691	11,486	8,053

Focused Two-Week Data View



Season Total Overview

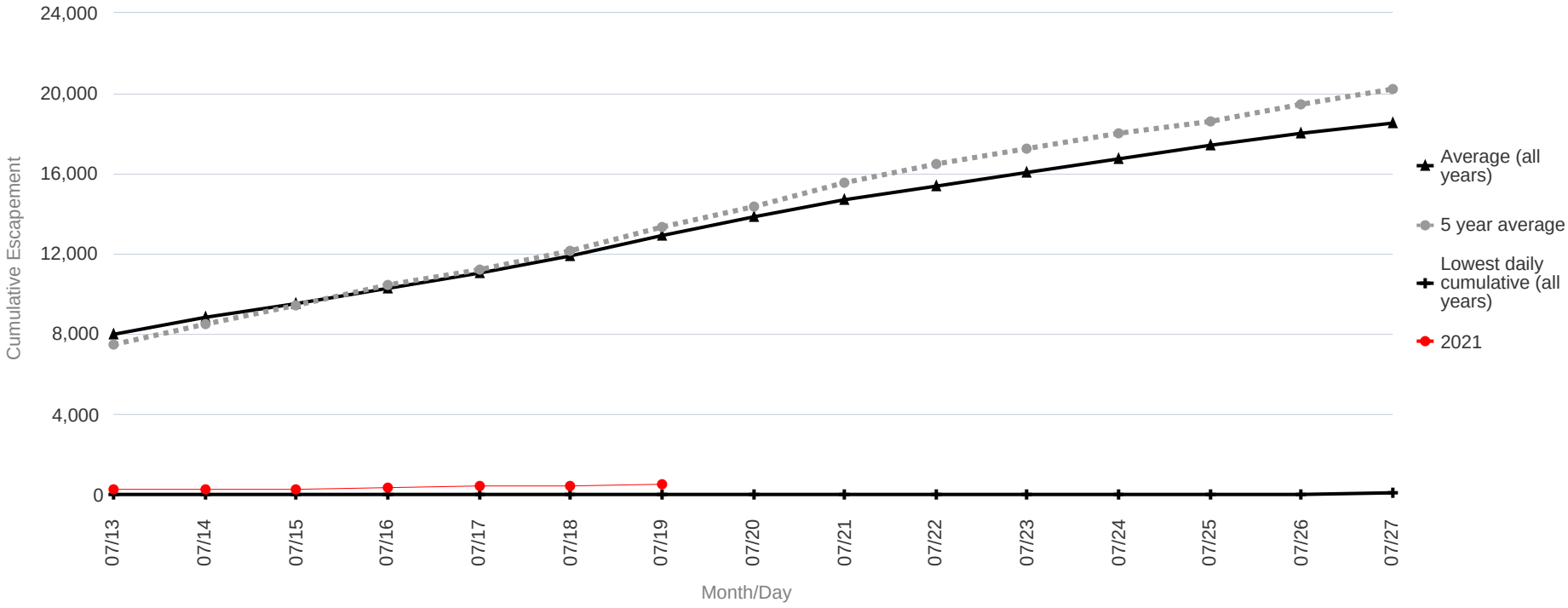


George River Salmon Monitoring Project
Cumulative Daily Passage of Chum Salmon

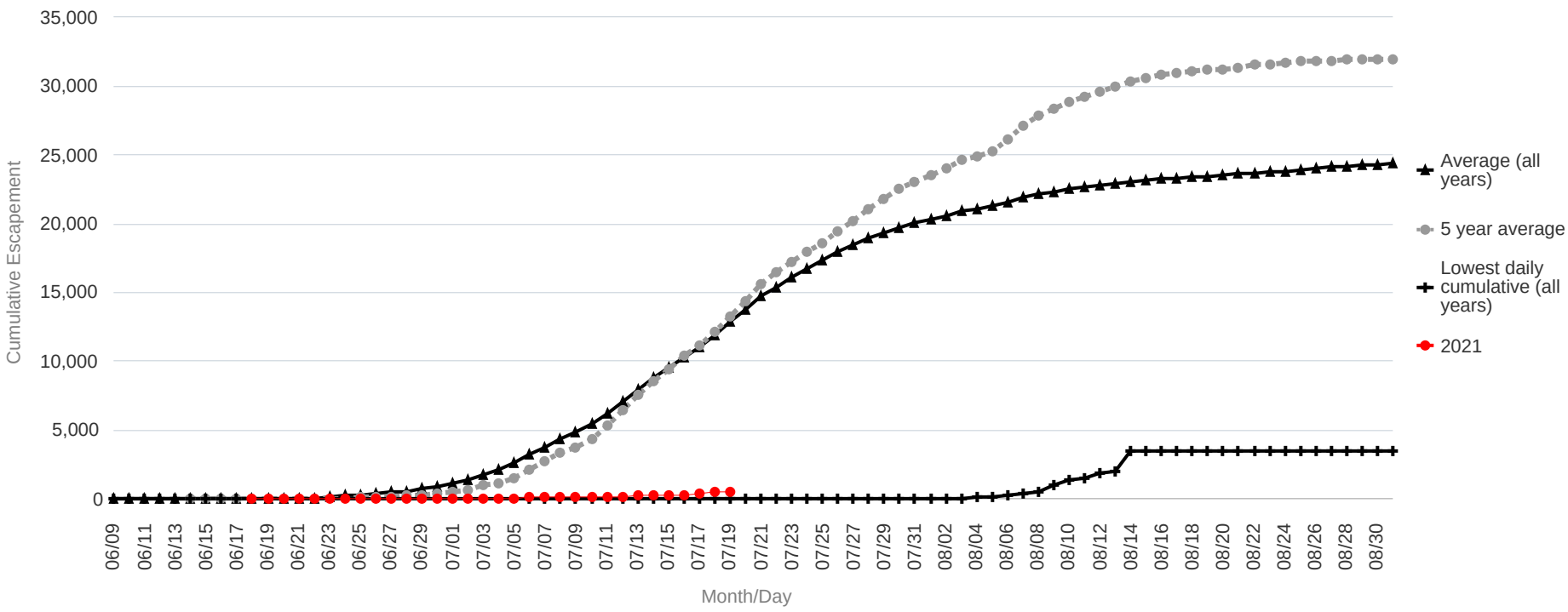
Date	Lowest daily cumulative (all years)	Average (all years)	5 year average	2021
07/13	0	7,967	7,527	243
07/14	0	8,818	8,517	270
07/15	0	9,550	9,458	307
07/16	0	10,311	10,422	315
07/17	0	11,075	11,189	406
07/18	1	11,939	12,193	475
07/19	2	12,937	13,317	508
07/20	4	13,814	14,355	
07/21	12	14,709	15,562	
07/22	13	15,385	16,475	
07/23	23	16,081	17,253	
07/24	28	16,749	18,020	
07/25	39	17,380	18,630	
07/26	58	17,969	19,413	
07/27	80	18,496	20,257	

	Lowest Count	Average Count	5 Year Average
Season Total	3,486	24,950	32,074

Focused Two-Week Data View



Season Total Overview



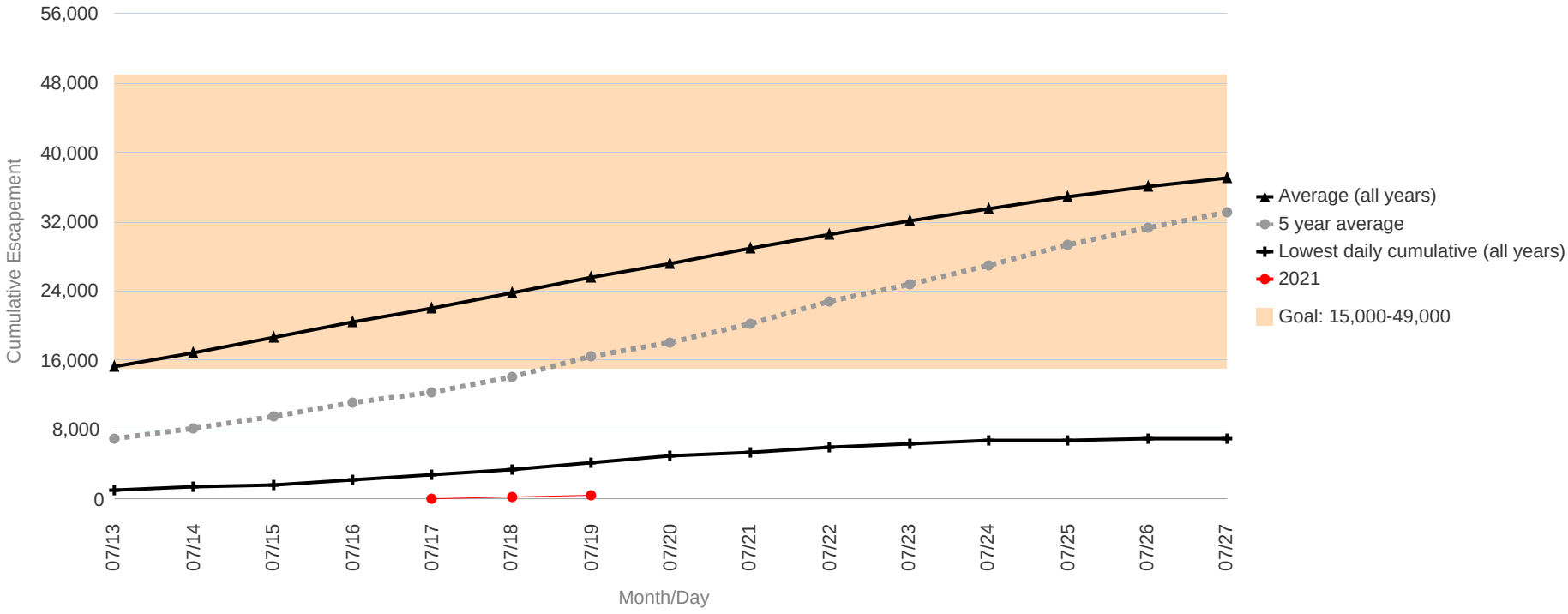
Kogrukluk River Salmon Monitoring Project
Cumulative Daily Passage of Chum Salmon

Escapement Goal Range: 15,000 to 49,000

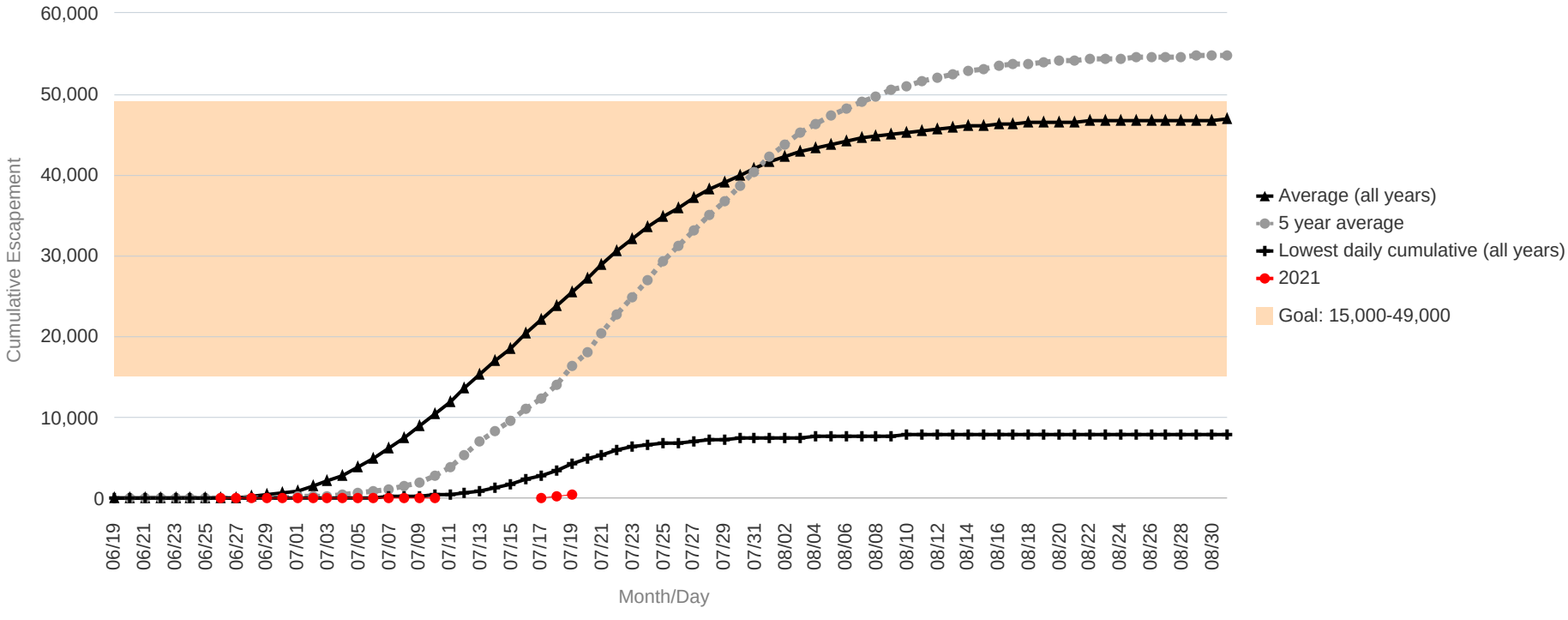
Date	Lowest daily cumulative (all years)	Average (all years)	5 year average	2021
07/13	995	15,267	7,022	
07/14	1,325	16,929	8,241	
07/15	1,693	18,556	9,580	
07/16	2,283	20,402	11,067	
07/17	2,765	22,073	12,381	63
07/18	3,483	23,714	14,101	207
07/19	4,272	25,493	16,417	423
07/20	4,908	27,176	18,155	
07/21	5,417	28,936	20,318	
07/22	5,942	30,602	22,783	
07/23	6,375	32,127	24,782	
07/24	6,706	33,571	27,041	
07/25	6,761	34,854	29,274	
07/26	6,884	35,985	31,303	
07/27	6,984	37,074	33,139	

	Lowest Count	Average Count	5 Year Average
Season Total	7,957	46,858	54,815

Focused Two-Week Data View



Season Total Overview

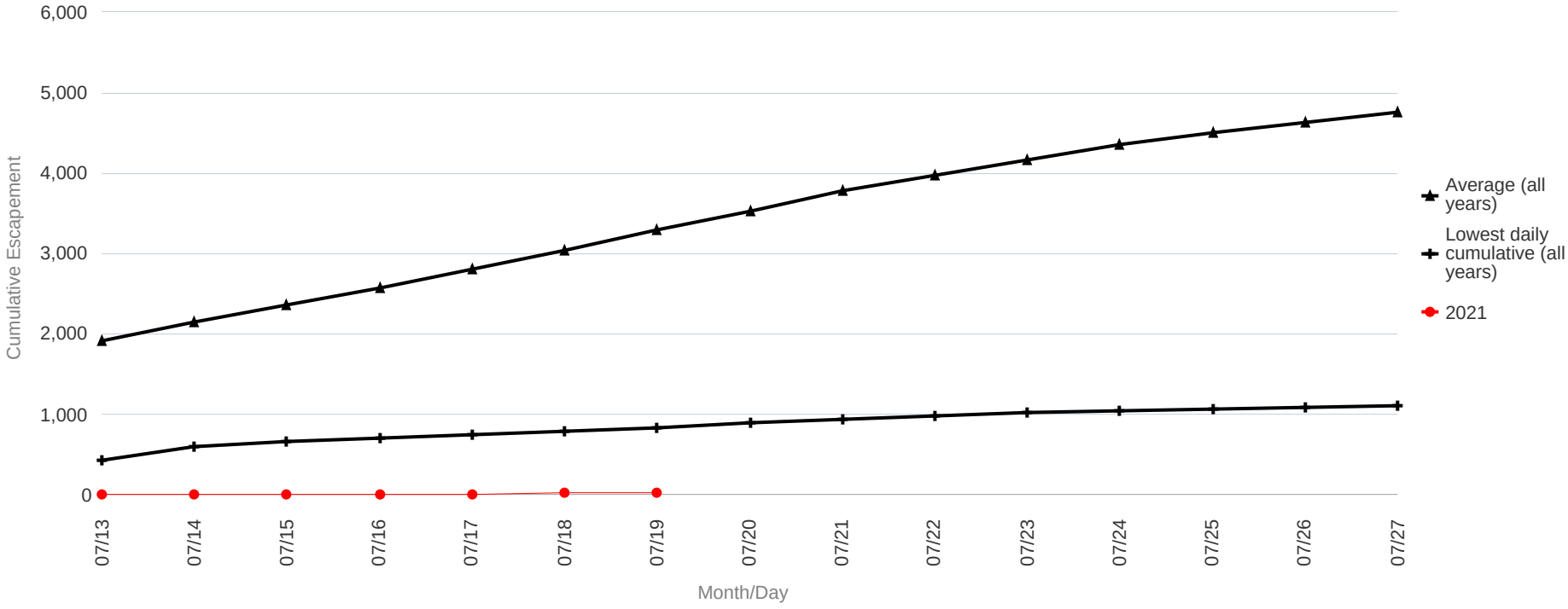


Takotna River Salmon Monitoring Project
Passage of Chum Salmon

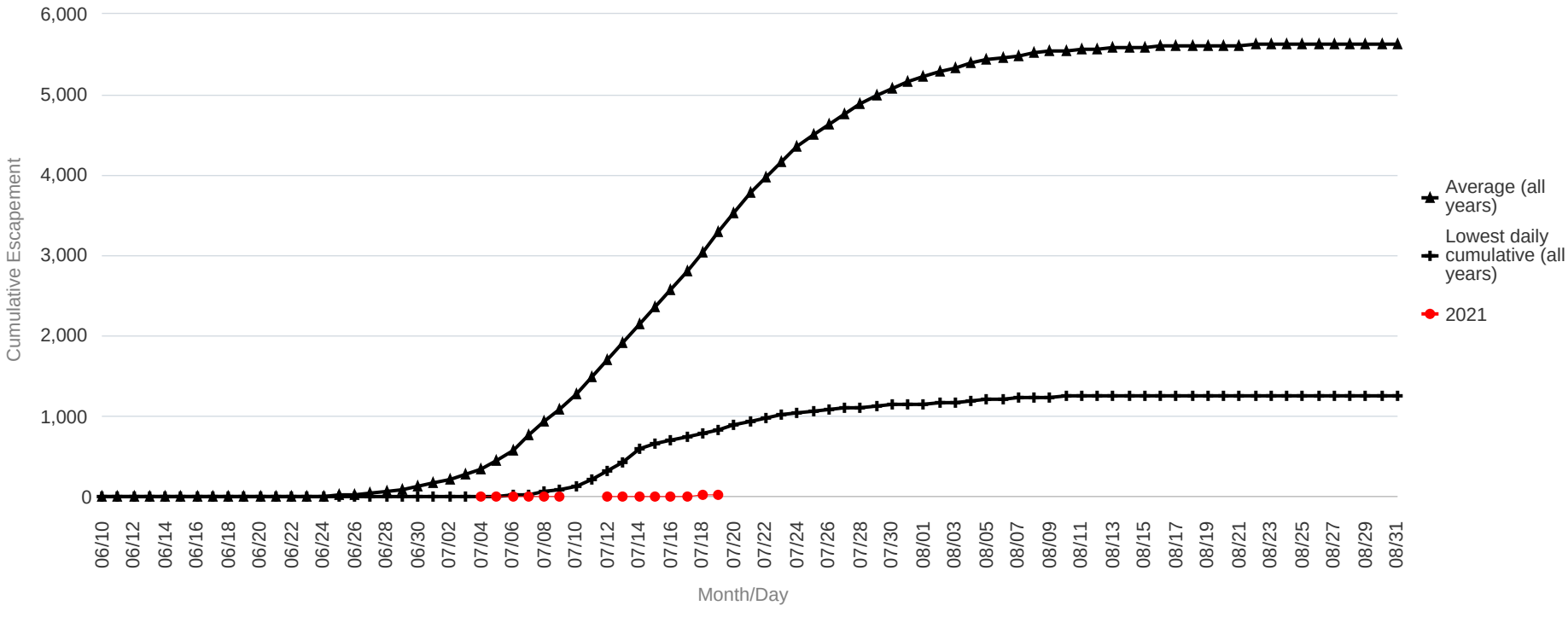
Date	Lowest daily cumulative (all years)	Average (all years)	2021
07/13	425	1,905	3
07/14	600	2,150	7
07/15	663	2,358	7
07/16	696	2,573	9
07/17	747	2,795	11
07/18	781	3,044	22
07/19	840	3,304	22
07/20	890	3,537	
07/21	933	3,776	
07/22	986	3,974	
07/23	1,019	4,173	
07/24	1,042	4,349	
07/25	1,067	4,501	
07/26	1,087	4,640	
07/27	1,101	4,766	

	Lowest Count	Average Count
Season Total	1,265	5,628

Focused Two-Week Data View



Season Total Overview

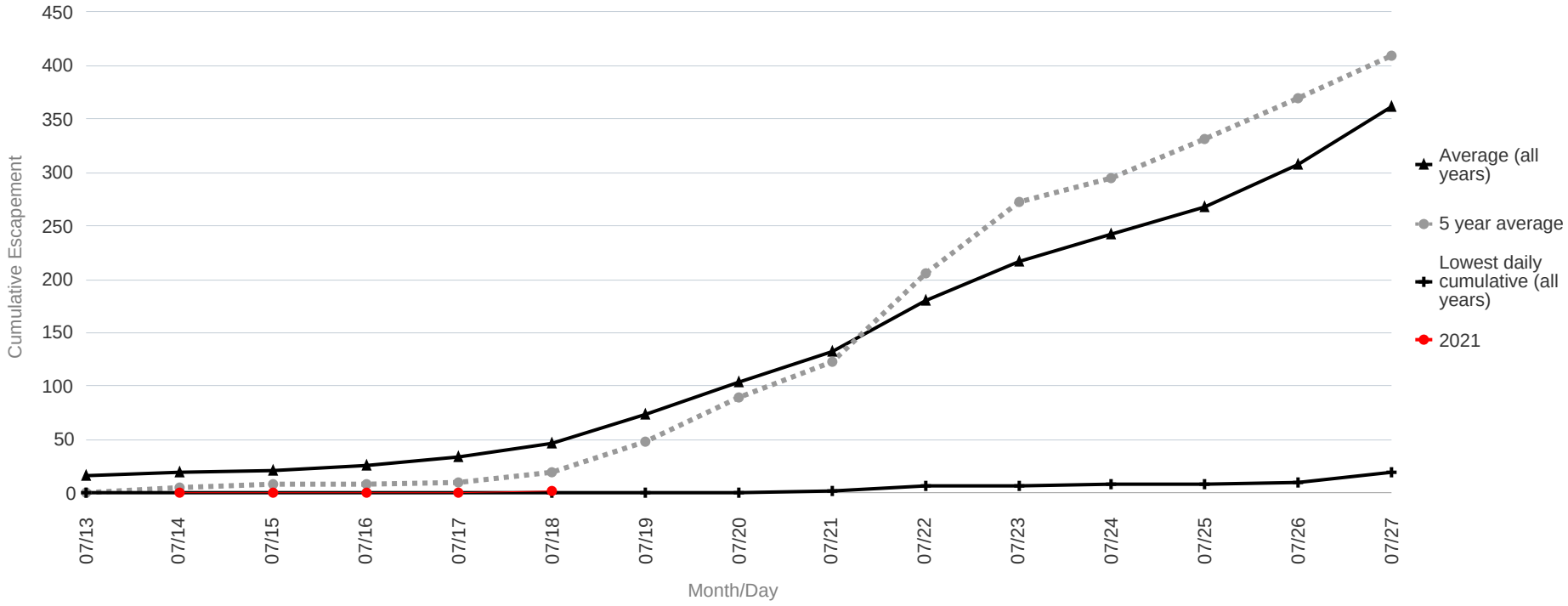


Salmon River (Aniak) Salmon Monitoring Project
Passage of Sockeye Salmon

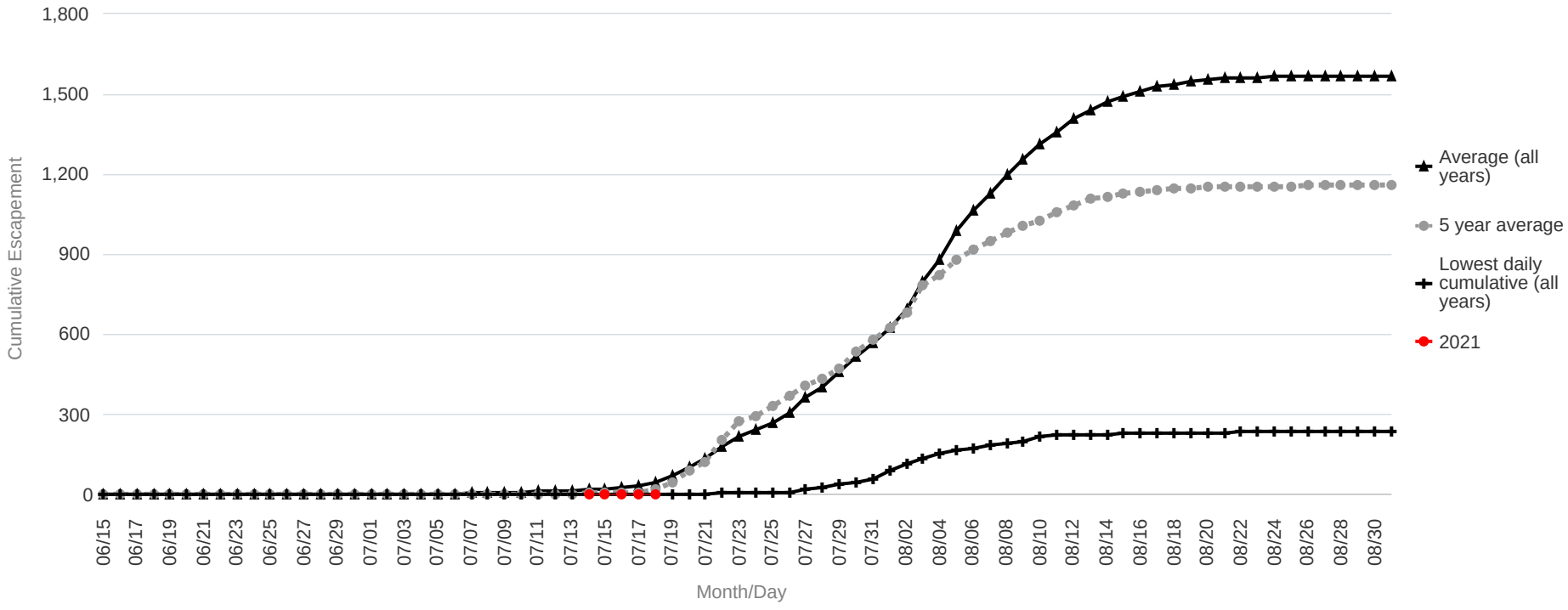
Date	Lowest daily cumulative (all years)	Average (all years)	5 year average	2021
07/13	0	16	1	
07/14	0	20	6	0
07/15	0	22	8	0
07/16	0	26	9	0
07/17	0	34	10	0
07/18	0	46	19	2
07/19	0	74	48	
07/20	1	103	89	
07/21	2	132	124	
07/22	6	180	205	
07/23	7	217	273	
07/24	8	242	295	
07/25	9	268	332	
07/26	10	307	370	
07/27	20	361	410	

	Lowest Count	Average Count	5 Year Average
Season Total	234	1,570	1,158

Focused Two-Week Data View



Season Total Overview



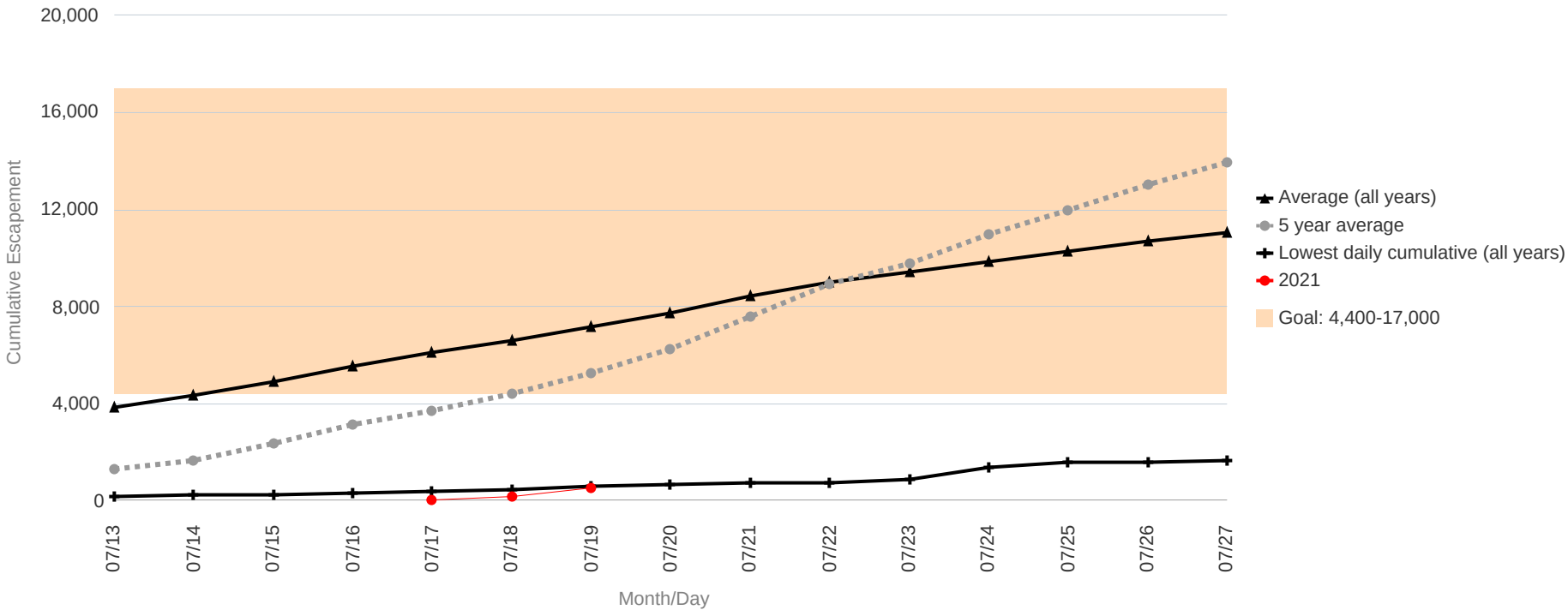
Kogrukluk River Salmon Monitoring Project
Cumulative Daily Passage of Sockeye Salmon

Escapement Goal Range: 4,400 to 17,000

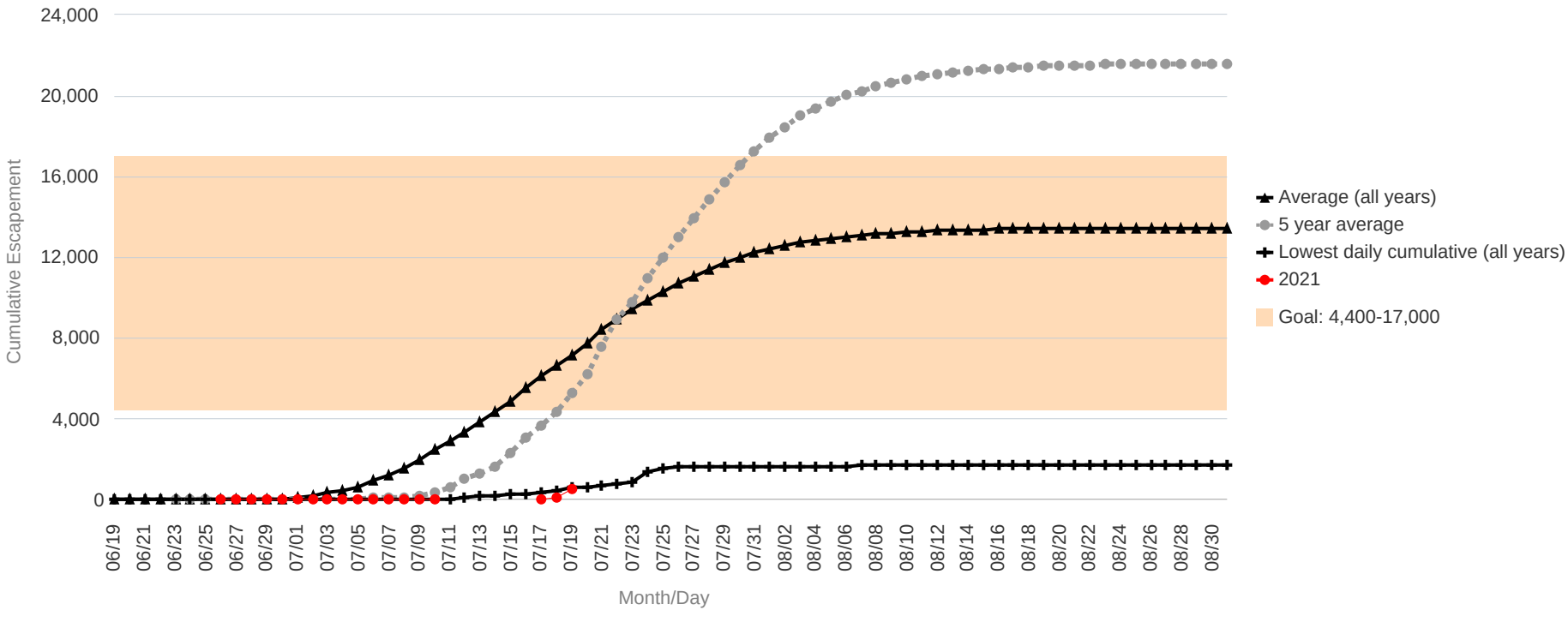
Date	Lowest daily cumulative (all years)	Average (all years)	5 year average	2021
07/13	148	3,802	1,304	
07/14	199	4,313	1,629	
07/15	260	4,869	2,314	
07/16	301	5,512	3,106	
07/17	363	6,097	3,670	43
07/18	459	6,606	4,378	124
07/19	593	7,149	5,247	521
07/20	647	7,756	6,251	
07/21	710	8,407	7,601	
07/22	748	8,965	8,924	
07/23	862	9,420	9,776	
07/24	1,336	9,858	10,988	
07/25	1,585	10,268	11,966	
07/26	1,600	10,673	12,998	
07/27	1,608	11,065	13,968	

	Lowest Count	Average Count	5 Year Average
Season Total	1,676	13,469	21,638

Focused Two-Week Data View



Season Total Overview

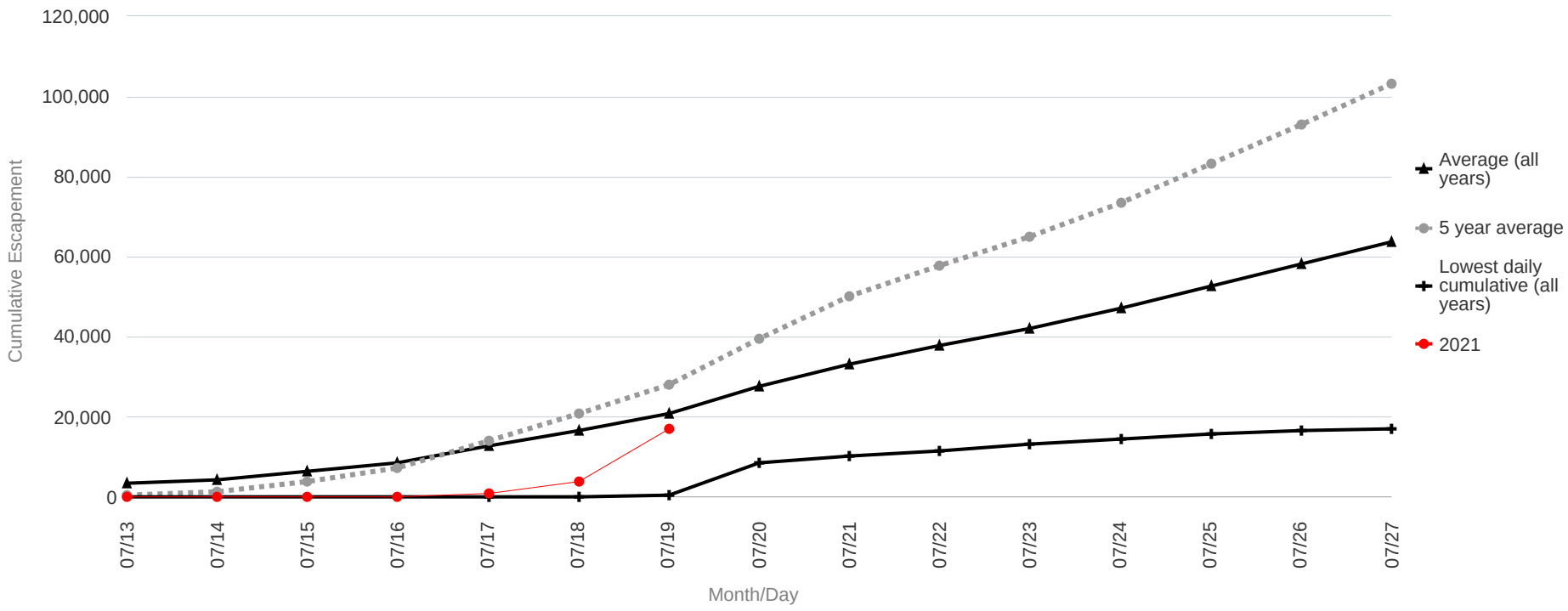


Telaquana River Salmon Monitoring Project
Passage of Sockeye Salmon

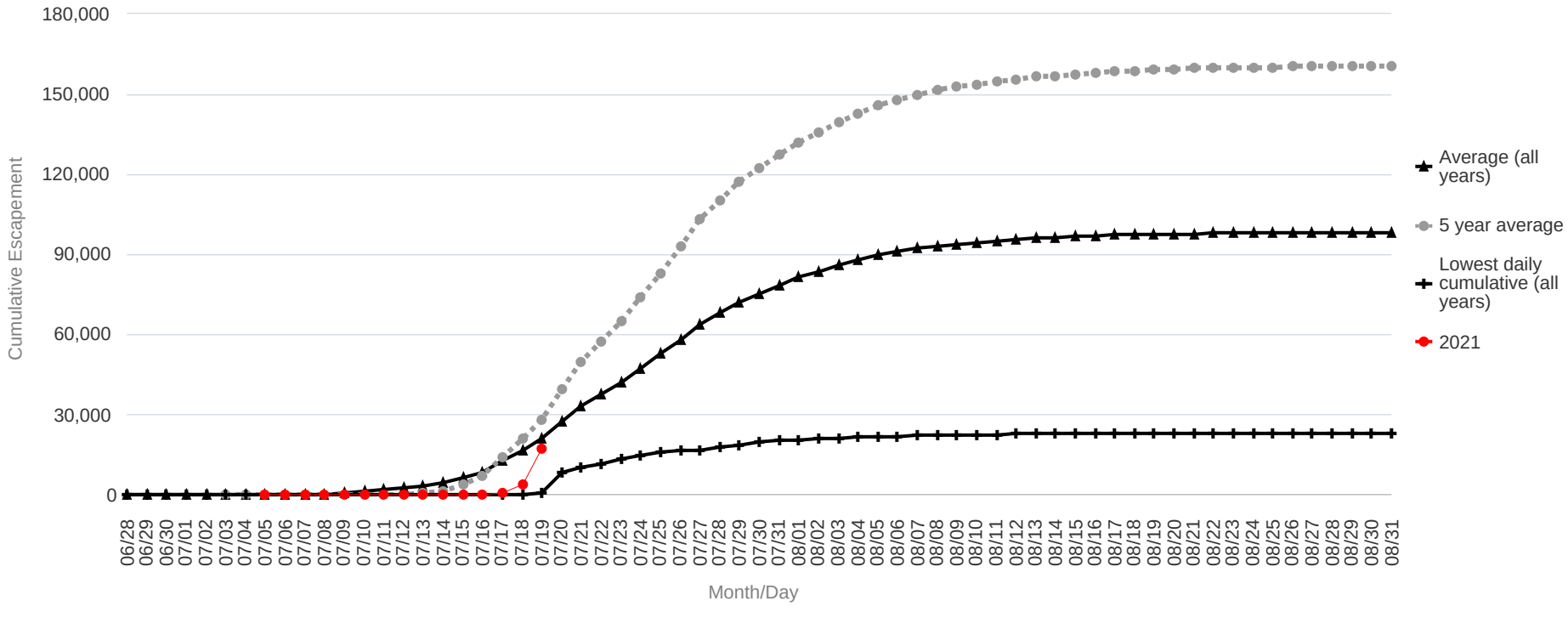
Date	Lowest daily cumulative (all years)	Average (all years)	5 year average	2021
07/13	1	3,344	476	1
07/14	2	4,348	1,396	1
07/15	2	6,271	4,075	1
07/16	3	8,674	7,423	3
07/17	3	12,603	14,230	983
07/18	36	16,769	20,982	3,780
07/19	695	20,890	28,034	17,106
07/20	8,623	27,460	39,760	
07/21	10,234	33,312	50,075	
07/22	11,467	37,812	57,591	
07/23	13,293	42,175	64,961	
07/24	14,622	47,215	73,716	
07/25	15,784	52,641	83,121	
07/26	16,443	58,261	93,162	
07/27	16,969	63,933	103,360	

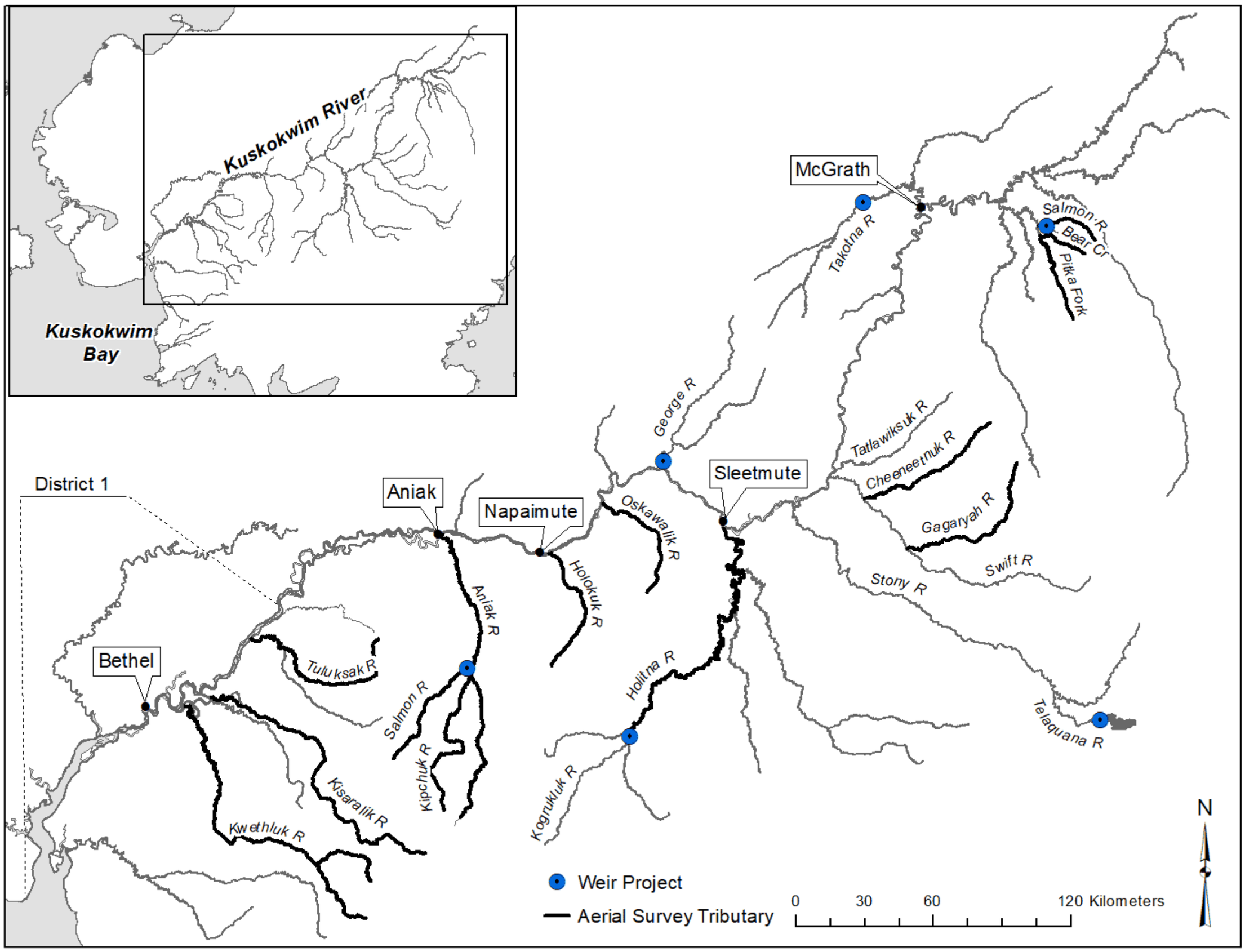
	Lowest Count	Average Count	5 Year Average
Season Total	23,007	98,127	160,271

Focused Two-Week Data View



Season Total Overview

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Kuskokwim Bay
McGrath
Takotna R
Salmon R
Bear Cr
Pitka Fork
George R
Tatlawiksuk R
Cheeneetnuk R
Gagaryah R
Swift R
Stony R
Sleetmute
Oskawalik R
Napaimute
Holokuk R
Aniak
Aniak R
District 1
Bethel
Tuluksak R
Salmon R
Kipchuk R
Kisaralik R
Kwethluk R
Holitna R
Kogrukluk R
Telaquana R
N
Weir Project
Aerial Survey Tributary
0
30
60
120 Kilometers

Bering Sea Bycatch Update

Bycatch updated through July 15, 2021

- King salmon bycatch to date: **11,707** (all stocks)
- Non-king salmon bycatch to date: **93,628** (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.