

# 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

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Special Action #: 3-KS-01-21

Special Action: [https://fws.gov/uploadedFiles/3-KS-01-21\\_Final\\_5.7.2021.pdf](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%
<b>Total</b>	<b>235</b>	<b>100%</b>

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).

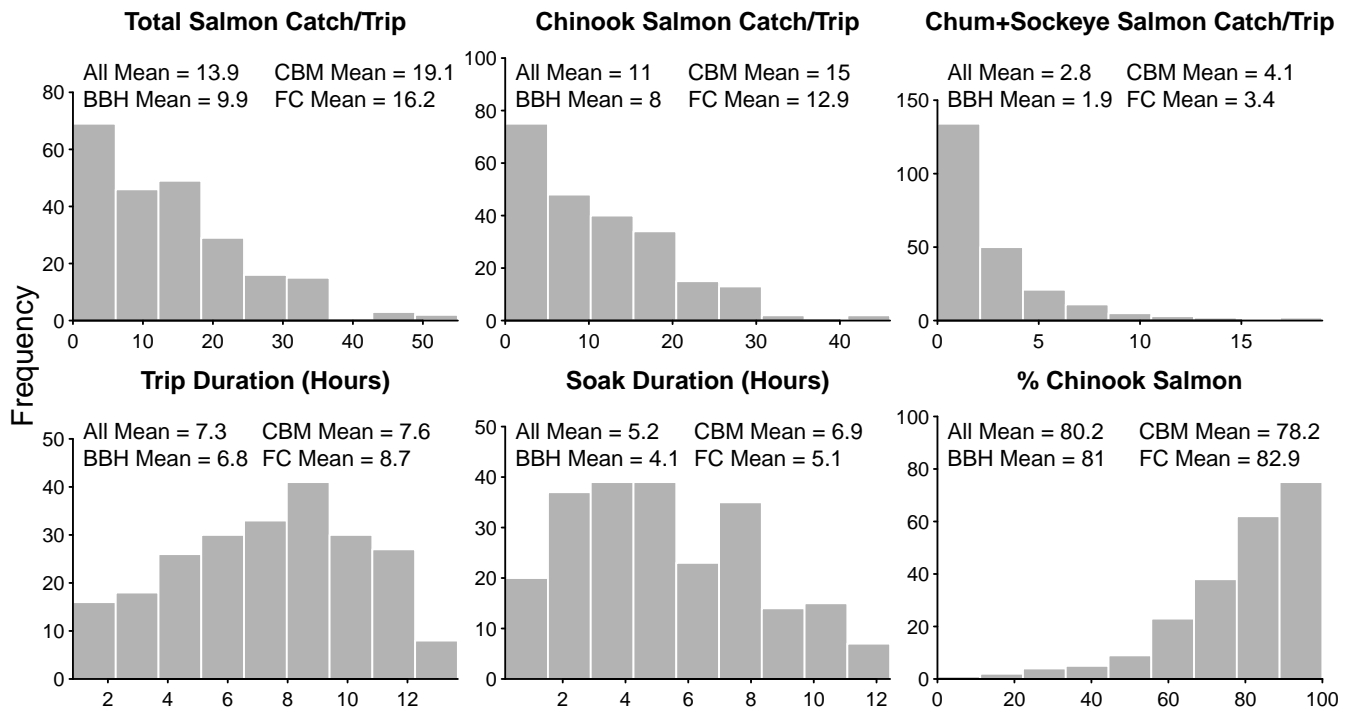
**TABLE 3.** Summary of relevant quantities by river stratum (area) for drift nets. Numbers in parentheses are 95% confidence intervals.

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)	<b>2,920</b> (2,140 – 3,700)
Johnson R. ↔ Napaskiak	65	105	1,910 (1,550 – 2,280)	90 (60 – 130)	320 (220 – 440)	<b>2,320</b> (1,890 – 2,780)
Napaskiak ↔ Akiachak	139	205	1,860 (1,580 – 2,150)	100 (60 – 150)	360 (270 – 450)	<b>2,310</b> (2,000 – 2,640)
Akiachak ↔ Akiak	1	40	370 (310 – 420)	20 (10 – 30)	70 (50 – 90)	<b>450</b> (400 – 520)
<b>All</b>	<b>229</b>	<b>467</b>	<b>6,330</b> (5,550 – 7,110)	<b>330</b> (240 – 440)	<b>1,340</b> (1,070 – 1,650)	<b>8,010</b> (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
<b>All</b>	<b>227</b>	<b>0</b>	<b>1</b>	<b>2.5</b>	<b>3</b>	<b>13.8</b>

**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
<b>All</b>	<b>229</b>	<b>0</b>	<b>4</b>	<b>11</b>	<b>16</b>	<b>46</b>

**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
<b>All</b>	<b>227</b>	<b>0</b>	<b>0.1</b>	<b>0.6</b>	<b>0.8</b>	<b>5</b>

**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
<b>All</b>	<b>229</b>	<b>0</b>	<b>1</b>	<b>3</b>	<b>4</b>	<b>19</b>

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

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

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

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

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

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

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

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

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

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