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# Kuskokwim River In-season Harvest and Effort Estimates

## 6/12/2023 Subsistence Harvest Opportunity (Drift & Set Nets)

Opportunity Time Period: 7:00 AM – 7:00 PM (12 Hours)

Area Covered by Estimates: Tuntutuliak ↔ Bogus Cr.

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## Data Sources

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

Data Source	Interviews	Percent
Bethel Boat Harbor (ONC)	79	45%
Other Villages (KRITFC)	75	43%
Bethel Area Fish Camps (ONC)	22	12%
<b>Total</b>	<b>176</b>	<b>100%</b>

Of these interviews, **171** 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
4:00 PM	6:00 PM	2	105	31

## Effort Estimates

- An estimated **202** drift boat trips occurred.
  - An estimated **97** trips started and ended when no flights occurred.
- An estimated **31** set net trips occurred.

## Harvest Estimates

- An estimated total of **1,524 (1,280 – 1,787)** salmon were harvested.
  - An estimated total of **1,003 (826 – 1,219)** Chinook salmon were harvested.
  - An estimated total of **107 (76 – 146)** chum salmon were harvested.
  - An estimated total of **414 (300 – 562)** sockeye salmon were harvested.
- Harvest by set nets accounted for an estimated **14 (0 – 44)** total salmon (**78%** Chinook salmon, **29%** chum salmon, and **0%** sockeye salmon).

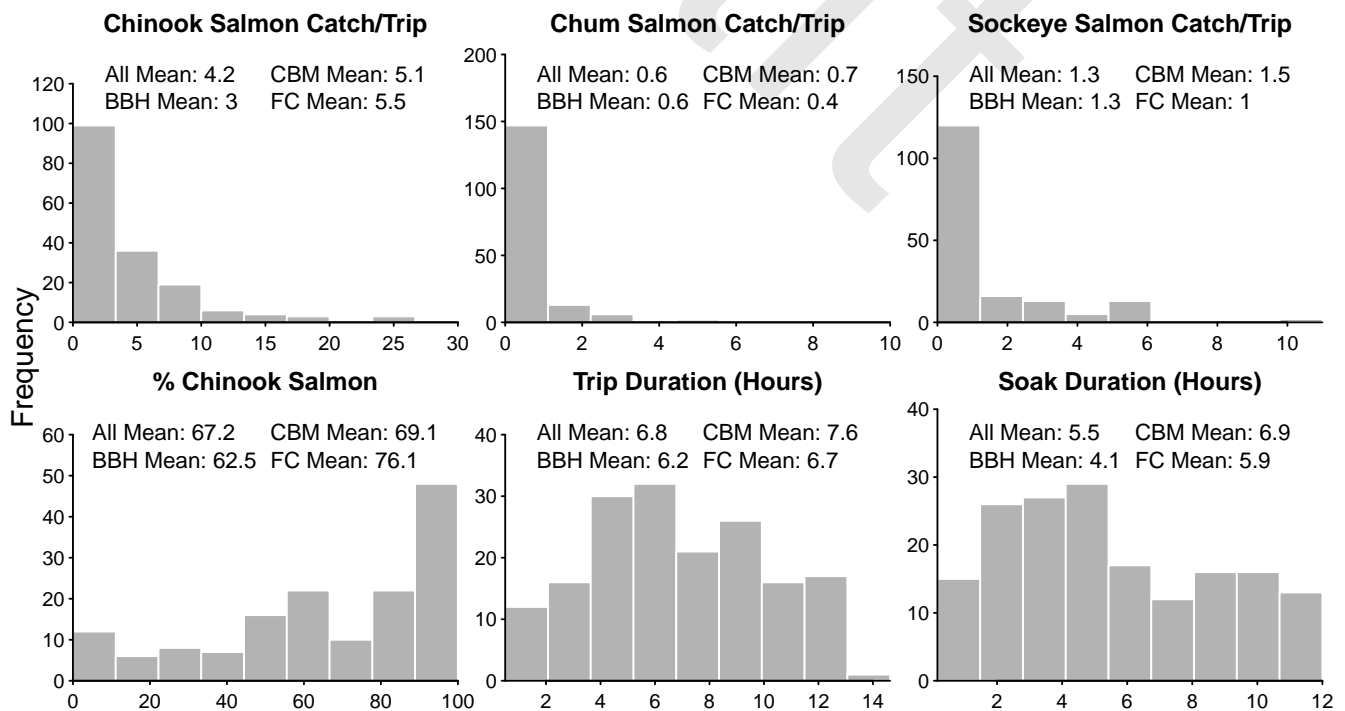
**TABLE 3.** Summaries by river stratum (area) for drift nets. Numbers in parentheses are 95% confidence intervals.

Stratum	Interviews	Effort Est.	Estimated Harvest			
			Chinook	Chum	Sockeye	Total
Tuntutuliak ↔ Johnson R.	0	6	27 (19 – 36)	5 (2 – 10)	18 (9 – 29)	51 (36 – 68)
Johnson R. ↔ Napaskiak	45	25	113 (80 – 149)	22 (8 – 40)	75 (41 – 117)	210 (152 – 277)
Napaskiak ↔ Akiachak	116	139	685 (515 – 897)	58 (34 – 93)	259 (158 – 407)	1,003 (778 – 1,238)
Akiachak ↔ Akiak	9	15	78 (60 – 98)	8 (5 – 12)	29 (18 – 43)	115 (92 – 141)
Akiak ↔ Bogus Cr.	1	17	89 (68 – 117)	10 (6 – 14)	32 (20 – 48)	131 (105 – 163)
<b>Total</b>	<b>171</b>	<b>202</b>	<b>992</b> (813 – 1,205)	<b>104</b> (73 – 142)	<b>414</b> (300 – 562)	<b>1,510</b> (1,271 – 1,770)

**TABLE 4.** Estimated trips, average (95% confidence limits) total salmon catch per trip, and percent catch by species 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.

Location	Total Trips	Total Catch/Trip	Salmon Species % Composition		
			Chinook	Chum	Sockeye
Downstream of Johnson R.	6	8 (6 – 11)	54% (42% – 67%)	10% (5% – 17%)	36% (23% – 49%)
Upstream of Johnson R.	196	7 (6 – 9)	66% (58% – 73%)	7% (5% – 9%)	27% (21% – 35%)

**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 (KRITFC), FC = Bethel Area Fish Camps (ONC).



# Appendix A: 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 per trip of Chinook salmon by fishing area.

Area	N	Min	25%	Mean	75%	Max
Johnson R. ↔ Napaskiak	45	0	1	4	6	18
Napaskiak ↔ Akiachak	116	0	1	4	5	30
Akiachak ↔ Akiak	9	0	3	5	7	9
Akiak ↔ Bogus Cr.	1	6	6	6	6	6
<b>All</b>	<b>171</b>	<b>0</b>	<b>1</b>	<b>4</b>	<b>6</b>	<b>30</b>

**TABLE A2.** Summary of drift net catch rate of Chinook salmon by fishing area (fish per 150 feet of net per hour).

Area	N	Min	25%	Mean	75%	Max
Johnson R. ↔ Napaskiak	43	0	0.2	0.9	1.3	3.6
Napaskiak ↔ Akiachak	114	0	0.2	0.9	0.9	8.6
Akiachak ↔ Akiak	9	0	1.3	1.7	2.1	4
Akiak ↔ Bogus Cr.	1	1.6	1.6	1.6	1.6	1.6
<b>All</b>	<b>167</b>	<b>0</b>	<b>0.2</b>	<b>0.9</b>	<b>1.2</b>	<b>8.6</b>

**TABLE A3.** Summary of drift net catch per trip of chum salmon by fishing area.

Area	N	Min	25%	Mean	75%	Max
Johnson R. ↔ Napaskiak	45	0	0	1	1	10
Napaskiak ↔ Akiachak	116	0	0	0	1	5
Akiachak ↔ Akiak	9	0	0	2	3	4
Akiak ↔ Bogus Cr.	1	0	0	0	0	0
<b>All</b>	<b>171</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>10</b>

**TABLE A4.** Summary of drift net catch rate of chum salmon by fishing area (fish per 150 feet of net per hour).

Area	N	Min	25%	Mean	75%	Max
Johnson R. ↔ Napaskiak	43	0	0	0.2	0.1	2.1
Napaskiak ↔ Akiachak	114	0	0	0.1	0.1	1.6
Akiachak ↔ Akiak	9	0	0	0.5	0.9	1.2
Akiak ↔ Bogus Cr.	1	0	0	0	0	0
<b>All</b>	<b>167</b>	<b>0</b>	<b>0</b>	<b>0.1</b>	<b>0.1</b>	<b>2.1</b>

**TABLE A5.** Summary of drift net catch per trip of sockeye salmon by fishing area.

Area	N	Min	25%	Mean	75%	Max
<b>Johnson R. ↔ Napaskiak</b>	45	0	0	2	3	11
<b>Napaskiak ↔ Akiachak</b>	116	0	0	1	2	8
<b>Akiachak ↔ Akiak</b>	9	0	0	1	3	6
<b>Akiak ↔ Bogus Cr.</b>	1	0	0	0	0	0
<b>All</b>	<b>171</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>11</b>

**TABLE A6.** Summary of drift net catch rate of sockeye salmon by fishing area (fish per 150 feet of net per hour).

Area	N	Min	25%	Mean	75%	Max
<b>Johnson R. ↔ Napaskiak</b>	43	0	0	0.6	0.5	6.4
<b>Napaskiak ↔ Akiachak</b>	114	0	0	0.3	0.4	9
<b>Akiachak ↔ Akiak</b>	9	0	0	0.5	0.9	2
<b>Akiak ↔ Bogus Cr.</b>	1	0	0	0	0	0
<b>All</b>	<b>167</b>	<b>0</b>	<b>0</b>	<b>0.4</b>	<b>0.4</b>	<b>9</b>

**TABLE A7.** Summary of drift net percent composition of Chinook salmon by fishing area.

Area	N	Min	25%	Mean	75%	Max
<b>Johnson R. ↔ Napaskiak</b>	45	0%	40%	61%	86%	100%
<b>Napaskiak ↔ Akiachak</b>	116	0%	50%	69%	100%	100%
<b>Akiachak ↔ Akiak</b>	9	31%	50%	74%	100%	100%
<b>Akiak ↔ Bogus Cr.</b>	1	100%	100%	100%	100%	100%
<b>All</b>	<b>171</b>	<b>0%</b>	<b>50%</b>	<b>67%</b>	<b>100%</b>	<b>100%</b>

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

Area	N	Min	25%	Mean	75%	Max
<b>Johnson R. ↔ Napaskiak</b>	45	1	4.5	6.3	9	12
<b>Napaskiak ↔ Akiachak</b>	115	0.5	5	6.8	9.2	14.6
<b>Akiachak ↔ Akiak</b>	9	5	8.5	9.7	12	12
<b>Akiak ↔ Bogus Cr.</b>	1	12	12	12	12	12
<b>All</b>	<b>170</b>	<b>0.5</b>	<b>4.8</b>	<b>6.9</b>	<b>9.2</b>	<b>14.6</b>

**TABLE A9.** Summary of drift net active fishing hours by fishing area.

Area	N	Min	25%	Mean	75%	Max
<b>Johnson R. ↔ Napaskiak</b>	45	0.5	2.8	5.1	6.7	11
<b>Napaskiak ↔ Akiachak</b>	115	0.2	2.9	5.4	8.2	12
<b>Akiachak ↔ Akiak</b>	9	5	8	8.5	10	11.5
<b>Akiak ↔ Bogus Cr.</b>	1	11	11	11	11	11
<b>All</b>	<b>170</b>	<b>0.2</b>	<b>3</b>	<b>5.5</b>	<b>8.5</b>	<b>12</b>

## Appendix B: Non-salmon Harvest Information

- An estimated total of **197 (139 – 262)** nonsalmon were harvested.
  - An estimated total of **154 (107 – 213)** sheefish were harvested.
  - An estimated total of **43 (19 – 74)** all whitefishes were harvested.
- Harvest by set nets accounted for an estimated **7 (0 – 31)** total nonsalmon (**100%** sheefish and **0%** all whitefishes).

**TABLE B1.** Summaries by river stratum (area) for drift nets. Numbers in parentheses are 95% confidence intervals.

Stratum	Interviews	Effort Est.	Estimated Harvest		
			Sheefish	Whitefish	Total
Tuntutuliak ↔ Johnson R.	0	6	4 (2 – 6)	2 (0 – 6)	6 (3 – 10)
Johnson R. ↔ Napaskiak	45	25	17 (8 – 28)	9 (0 – 24)	26 (12 – 42)
Napaskiak ↔ Akiachak	116	139	103 (60 – 160)	22 (4 – 51)	125 (75 – 186)
Akiachak ↔ Akiak	9	15	11 (7 – 17)	5 (2 – 8)	16 (10 – 22)
Akiak ↔ Bogus Cr.	1	17	12 (7 – 19)	5 (2 – 9)	17 (11 – 25)
<b>Total</b>	<b>171</b>	<b>202</b>	<b>147</b> (102 – 204)	<b>43</b> (19 – 74)	<b>190</b> (135 – 252)

**TABLE B2.** Summary of drift net catch per trip of sheefish by fishing area.

Area	N	Min	25%	Mean	75%	Max
Johnson R. ↔ Napaskiak	45	0	0	1	1	4
Napaskiak ↔ Akiachak	116	0	0	1	1	8
Akiachak ↔ Akiak	9	0	0	0	1	1
Akiak ↔ Bogus Cr.	1	0	0	0	0	0
<b>All</b>	<b>171</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>8</b>

**TABLE B3.** Summary of drift net catch per trip of all whitefishes by fishing area.

Area	N	Min	25%	Mean	75%	Max
Johnson R. ↔ Napaskiak	45	0	0	0	0	2
Napaskiak ↔ Akiachak	116	0	0	0	0	2
Akiachak ↔ Akiak	9	0	0	1	1	5
Akiak ↔ Bogus Cr.	1	0	0	0	0	0
<b>All</b>	<b>171</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>