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## **2023 Yukon Area Fall Season Summary**

This announcement provides a preliminary summary of the 2023 Yukon Area (Figure 1) fall chum and coho salmon run size and escapements.

### **2023 Fall Season Outlook**

The fall chum salmon run size forecast, using brood year analysis with an adjustment for recent poor productivity, was for 251,000 fish, with a range of 112,000 to 602,000 fish. A preseason run size projection was later made in mid-July using the relationship between historical summer and fall chum salmon run size estimates. Using the inseason estimate of 873,000 summer chum salmon, the preseason projection for a fall chum salmon was a run size of 425,000 fish.

The coho salmon outlook for 2023 was for a below average run size, where average (1995–2022 excluding 1996 and 2009) was 222,000 fish. The outlook assumed an average survival of fish from the 2019 parent year, for which most escapements monitored were below average and the recent trend has been run sizes below average.

### **Preseason Management Strategy**

Management of the Yukon Area fall season salmon fisheries are in accordance with the *Yukon River Drainage Fall Chum Salmon Management Plan* (5 AAC 01.249). The plan requires that when a projected run size is less than 300,000 chum salmon, all subsistence, personal use, sport, and commercial directed chum salmon fisheries close. Subsistence-directed chum salmon fisheries may open if the drainagewide or individual escapement goals are projected to be achieved. The plan also requires a run size of at least 550,000 chum salmon to allow directed commercial fishing on surplus fish above that level. There are three U.S. escapement goals for fall chum salmon; Yukon River drainagewide (300,000–600,000), Teedriinjik (85,000–234,000), and Delta River (7,000–20,000), and two Canadian treaty objectives; Yukon River Mainstem (70,000–104,000 plus harvest shares) at the Canadian Border near Eagle, Alaska and Fishing Branch River (22,000–49,000) in the Canadian portion of the Porcupine River drainage.

Based on the preseason projection of 425,000 fall chum salmon and a below average run of coho salmon, preseason management strategies included the following:

- Yukon Area districts with summer chum salmon would remain open for an additional 10 days into fall season to allow for additional harvest on the summer stock, which makes up the majority of chum salmon in the river at that time.

- After the initial 10 days, subsistence fishing would remain closed until inseason fall chum salmon projections indicated escapement goals would be met.
- If escapement goals were projected to be met, harvestable surplus would be evaluated for potential subsistence fishing opportunity.
- If escapement goals were not projected to be met, closures would be in place until the fall chum migration concluded. Important fall chum spawning tributary drainages would remain closed through December to improve salmon escapement to the spawning grounds.
- Subsistence fishing with nonsalmon gear (including 4-inch and smaller mesh size set gillnets limited to 60 feet or shorter) and selective gear (dip nets, hook and line, beach seine, and manned fish wheels) for pink, sockeye, and coho salmon would be allowed. If a conservation concern existed for a salmon species, there would be a requirement to release the species from nonsalmon gear excluding gillnets.
- Commercial salmon fishing would not be allowed unless the inseason drainagewide fall chum salmon run projection exceeded 550,000 fish, and a commercial surplus was identified, and reasonable subsistence fishing opportunity had been provided.

### **2023 Run Assessment**

Assessment information collected from projects located in the lower river were used to inform management decisions. The projects included two lower river drift gillnet test fisheries that provided run timing and relative abundance information, and a mainstem Yukon River sonar, located near the community of Pilot Station, that provided fish abundance estimates. Stock composition information for chum salmon was provided by genetic samples collected at the mainstem Yukon River sonar. Upriver projects that monitored escapement consisted of a mainstem Yukon River sonar operated near the U.S./Canada border near Eagle; Teedriinjik (Chandalar River) sonar; Sheenjek River sonar; an upper Porcupine River sonar; a weir/sonar project operated in the Fishing Branch River, a Porcupine River headwater tributary; foot surveys conducted in the Delta River, a tributary of the Tanana River; and boat surveys in the Delta Clearwater River, a tributary of the Tanana River. Age, sex, and length information was collected at both the lower river test fisheries, the mainstem Yukon River sonar near the U.S./Canada border, and from the Fishing Branch and Delta rivers.

By regulation, the fall season began in District 1 on July 16, and chum salmon caught after that date in the Lower Yukon Test Fishery (LYTF) are considered fall chum salmon. Mountain Village Test Fishery (MVTF) began operating on July 18, and the mainstem Yukon River sonar, operated near the community of Pilot Station, began counting fall chum salmon on July 19. The transition of upriver districts and subdistricts to fall season management was based on the migration timing of fall chum salmon. Yukon Delta Fisheries Development Association assisted LYTF operations throughout the season and conducted all drifts in late August through the end of the season, with conclusion of the project on September 10. Preliminary cumulative fall chum salmon catch per unit effort (CPUE) at LYTF was 891.42, which was well below the historical average of 1,477.48. The MVTF project ceased operations September 12 with a preliminary cumulative fall chum salmon CPUE of 2,709.83, which was near the historical median of 2,032.08. The mainstem Yukon River sonar near Pilot Station ceased operations on September 7.

After July 19, four groups of chum salmon were monitored entering the Yukon River (Figure 2). The early fish that entered in July were predominantly summer chum salmon, while fish entering in August and September were predominantly fall chum salmon. The cumulative chum salmon passage estimate during the fall season at the mainstem sonar project near Pilot Station was 370,015 fish, which was well below the historical median of 688,000 fish. Applying mixed stock genetic analysis to all the chum salmon that passed the mainstem sonar after July 18, the estimated number of fall chum salmon was near 290,000 fish. Throughout the fall season, the estimated run size generally tracked below the 300,000 fall chum salmon threshold necessary to allow subsistence fishing (Figure 2).

Run timing for fall chum salmon in the lower river assessment projects was near average and upriver escapement projects were slightly later than average. Water levels were average to above average during the fall salmon migration within the Alaska portion of the Yukon River drainage. Water temperatures were above average in August and average in September in the lower Yukon River.

The 2023 fall chum salmon preliminary post season drainagewide estimated run size of 318,700 fish was the fifth lowest on record, compared to a median run size (1974–2022) of 962,000 fish. The drainagewide run estimate for fall chum salmon was developed based on observed escapements, genetic components, and harvests.

Coho salmon appeared to be weak and late through the entire run (Figure 3). The cumulative coho salmon passage at the mainstem sonar plus harvest below was estimated to be 49,700 fish, which was well below the historical median of 141,000 fish (Figure 3), and the second lowest ever observed. Cumulative CPUE for coho salmon at both the LYTF and MVTF projects were well below their respective historical medians for the projects. Run timing for coho salmon was 4 days later than average across all the assessment projects. The run size index was estimated to be 63,000 coho salmon, which includes estimates of passage after the sonar concludes for the season. The average index of abundance is 222,000 coho salmon.

### **Subsistence Fishery**

The fall season began with a preseason projection of 425,000 fall chum salmon based on the summer and fall chum salmon run size relationship. In accordance with the *Yukon River Drainage Fall Chum Salmon Management Plan*, all personal use, sport, and commercial fishing was closed, and subsistence fishing for chum salmon was open for the first 10 days of the fall season as the projection exceeded the lower end of the drainagewide escapement goal of 300,000-600,000 chum salmon. In the early portion of the fall season, the majority of the run was comprised of summer chum salmon which were abundant enough to allow subsistence fishing before the arrival of fall chum salmon. Subsistence fishing for summer chum salmon was continued for the first 10 days of the fall season with selective gear, which includes dip nets, beach seines, manned fish wheels, and hook and line. Chinook salmon were required to be released alive from these gears. Subsistence fishing for chum salmon then closed to evaluate inseason abundance estimates of genetic fall chum salmon.

As the season progressed, the fall chum salmon run projection remained below the 300,000 fish threshold to allow subsistence salmon fishing in most areas. In accordance with the management plan, subsistence directed chum salmon fisheries could be opened if an individual escapement goal was projected to be met. The Teedriinjik River opened to subsistence salmon fishing with fish wheels and 6-inch or smaller mesh gillnets near the midpoint of the fall chum salmon run as it was

projected to achieve the escapement goal. Closures remained in place for other Yukon River and Canadian-origin fall chum salmon stocks as escapement goals were not projected to be met.

Subsistence fishing for nonsalmon and pink, sockeye, and coho salmon was allowed with gear restrictions. Due to salmon conservation, 4-inch or smaller mesh size gillnets were limited to operation as a set net and restricted to 60 feet or shorter in length. During salmon closures, salmon species were specified for release from nonsalmon and selective gear, excluding gillnets. Subsistence fishing for coho salmon was allowed until late in fall season, when it was closed due to poor returns.

Once the tail end of the salmon runs had passed, subsistence salmon fishing restrictions were relaxed starting October 1 in the Lower Yukon and progressing to upriver districts based on migration timing of fall chum salmon. However, to protect spawning salmon, important spawning tributaries for fall chum and coho salmon remained closed to subsistence salmon fishing through the end of December. These closures included the Koyukuk, Porcupine, Nenana, and Kantishna River drainages.

The preliminary subsistence harvest estimate of fall chum salmon was 6,990 fish, which is well below the 2018–2022 average of 27,507 fish (Table 1). The preliminary subsistence harvest estimate of coho salmon was 1,476 fish, which is well below the 2018–2022 average of 3,014 fish (Table 2). This was the fourth consecutive year of subsistence salmon fishing closures. The average subsistence harvest has declined dramatically due to the continued closures.

### **Commercial Fishery**

In 2023, no commercial fisheries occurred for fall chum or coho salmon in the Yukon Area. This was the fourth year of consecutive commercial salmon fishery closures during the fall season. Prior to the recent poor years, the commercial harvest from 2012–2019 averaged 305,757 fall chum salmon and 110,620 coho salmon. Historical harvest, value, and numbers of permits in the fall chum and coho salmon fishery can be found in Tables 3-6.

### **Salmon Escapement**

#### Fall Chum Salmon Escapement

The total drainagewide run size of fall chum salmon was estimated postseason, based on information from individually monitored spawning escapements and includes preliminary estimates of U.S. and Canadian harvests. In 2023, the preliminary estimate of the drainagewide total run size is approximately 318,700 fall chum salmon, which is an improvement from the extremely poor runs observed since 2020. With the removal of the estimated total harvests this season, the drainagewide escapement is estimated to be approximately 311,700 fall chum salmon, which is within the sustainable escapement goal (SEG) range of 300,000 to 600,000 fish.

Fall chum salmon escapements in 2023 for the Teedriinjik and Delta River were both above the lower end of their respective escapement goals. In the Teedriinjik River, the estimated escapement of 136,551 fall chum salmon (including expansions to estimate the run after the sonar project ended) was above the sustainable escapement goal (SEG) range of 85,000 to 234,000 fish (Table 7). The Sheenjek River had an estimated run size of 15,958 fall chum salmon (based on sonar). An estimated 15,654 fall chum salmon were counted past the Porcupine River border sonar downstream of Old Crow in Canada. The Fishing Branch River weir estimate was approximately 11,528 fall chum salmon which was 52% below the lower end of the Interim Management

Escapement Goal (IMEG) range of 22,000–49,000 fish (Table 7). The fall chum salmon passage estimate at the mainstem Yukon River sonar project near Eagle was 22,179 fish (90% CI: 20,505–21,119) for the dates August 23 through October 6. The fall chum salmon estimate was subsequently adjusted to include 1,367 fish, which were estimated to pass after the project was concluded for winter. The preliminary escapement for the mainstem Yukon River in Canada was derived by subtracting the upstream U.S. and Canadian harvests above the Eagle sonar project from the expanded sonar estimate (in 2023 the preliminary U.S. harvest was 89 fish, and no fall chum salmon harvests were reported for Canada). The preliminary mainstem Yukon River escapement estimate of 22,090 fall chum salmon was 32% below the IMEG range of 70,000 to 104,000 fish (Table 7) and is the second lowest on record. The average escapement since 1980 and prior to the declines in 2020 was 117,000 fall chum salmon.

The Tanana River preliminary escapement estimate was 121,000 fall chum salmon based on mixed stock analysis and represented approximately 38% of the overall run size. The estimated escapement in the Delta River of 13,366 fall chum salmon was nearly double the lower end of the SEG range of 7,000 to 20,000 fish (Table 7).

#### Fall Chum Salmon Age, Sex, Length and Stock Composition

Stock composition estimates for chum salmon were provided by USFWS Conservation Genetics Laboratory using tissue samples (fin clips) collected from salmon captured in the mainstem Yukon River sonar test net fishery. Chum salmon genetic samples processed from four strata between July 19 and September 7 (fall season) indicated that the stocks represented were approximately 22% summer, 32% Border U.S. (Teedriinjik/Sheenjek/Draanjik), 13% Canadian, and 33% Tanana.

In 2023, the proportion of age-3 (3%) fall chum salmon was near average, age-4 fish (79%) was above average, age-5 fish (18%) was below average, and age-6 fish (<1%) was below average based on samples collected at the Lower Yukon Test Fishery using 6-inch mesh drift gillnets. The 2018 and 2019 brood year estimates of return per spawner of 0.38 and 0.64, respectively, were both well below the 1974–2017 average of 1.69. Females comprised 55% of the samples which was slightly below the 1986 to 2022 average (58%). Fall chum salmon length samples in 2023 averaged 572 mm, well below the long term 1981–2022 average of 592 mm.

#### Coho Salmon Escapement

There are few coho salmon spawning escapement assessment projects in the Yukon River drainage because of funding limitations and late timing relative to onset of winter. The sonar in the mainstem Yukon River near Pilot Station was operated through September 7 and had an estimated passage of 49,697 coho salmon (90% CI: 42,088–57,306) which is well below the historical average (2012–2022) of 141,000 fish (Table 8). A series of boat surveys were conducted on the Delta Clearwater River, with the peak count occurring in late October of an estimated 1,794 coho salmon (Table 8). The usual escapement aerial surveys in the Nenana River index areas and the upper Tanana River were not conducted in 2023 due to inclement weather during late October to early November when peak counts usually occur (Table 8).

### Coho Salmon Age, Sex and Length Composition

In 2023, the proportion of age-3 (25%) coho salmon was above average, age-4 fish (65%) was below average, and age-5 fish (2%) was below average based on samples collected at the LYTF using 6-inch mesh drift gillnets. Females comprised 41% of the samples which was below the 1983 to 2022 average (47%). Coho salmon sampled in both the LYTF and MVTF projects were smaller than average and dominated by age-4 fish. MVTF caught smaller coho salmon and higher proportion of females than LYTF. Sex and length information were also taken from coho salmon (n=290) from the test fishery associated with the mainstem sonar operated near Pilot Station. Coho salmon at the sonar project averaged 519 mm in length, which was below the 1998–2022 average of 555 mm and the second smallest observed at this project.

### Federal Special Action

The Alaska Department of Fish and Game (ADF&G) and the U.S. Fish and Wildlife Service (USFWS) have coordinated on this season summary announcement. The Federal manager issued Federal emergency special actions to restrict the selective gear opportunities for summer chum and coho salmon to federally-qualified subsistence users only in federal public waters. For information regarding Federal subsistence fishing regulations contact the USFWS Yukon River Subsistence Fishery Manager Holly Carroll at 907-351-3029.

### Perspectives on Low Returns

It is unclear what is driving the low fall chum salmon numbers returning to the Yukon River drainage. Despite meeting the fall chum salmon drainagewide escapement goals in their respective parent years, fall chum salmon numbers were low throughout the drainage. The dominant parent years contributing to the 2023 run were from 2018 (656,000 fish) and 2019 (529,000 fish), both of which were within or above the drainagewide escapement goal of 300,000–600,000 fish (Figure 4). It is speculated that factors impacting Yukon River fall chum salmon runs are occurring during their early marine residency. The Bering Sea and Gulf of Alaska, both of which are the marine habitats of Yukon River fall chum salmon, have experienced above average sea surface temperatures between 2016 and 2019. Marine research focused on the juvenile life stage, or the first year at sea, has helped us understand how increasing temperatures affect juvenile chum salmon. When sea surface temperatures are warmer than average, juvenile chum salmon tend to have less food in their stomachs, eat lower-quality prey, and are in poorer health condition. ADF&G is involved in multiple collaborative projects to continue studying the marine life stage of Yukon River chum salmon. One of these projects is analyzing samples from chum salmon collected during high seas winter surveys to understand the distribution, diet, and condition of chum salmon from western Alaska. Another project is using chum salmon bones, which can act like time capsules and can teach us about the marine life of fall chum salmon without needing the extraordinary expense and infrastructure required for large marine surveys. The progress and results from these projects will be shared in future public meetings.

The department is committed to investigating the cause of the recent Pacific salmon declines, especially regarding returns to the Yukon Area.

If you have further questions on upcoming marine salmon research efforts, contact Dr. Katie Howard, [kathrine.howard@alaska.gov](mailto:kathrine.howard@alaska.gov) and Sabrina Garcia, [sabrina.garcia@alaska.gov](mailto:sabrina.garcia@alaska.gov). Research updates are shared on <https://www.facebook.com/ADFGUnderseaWorldOfSalmonAndSharks>.

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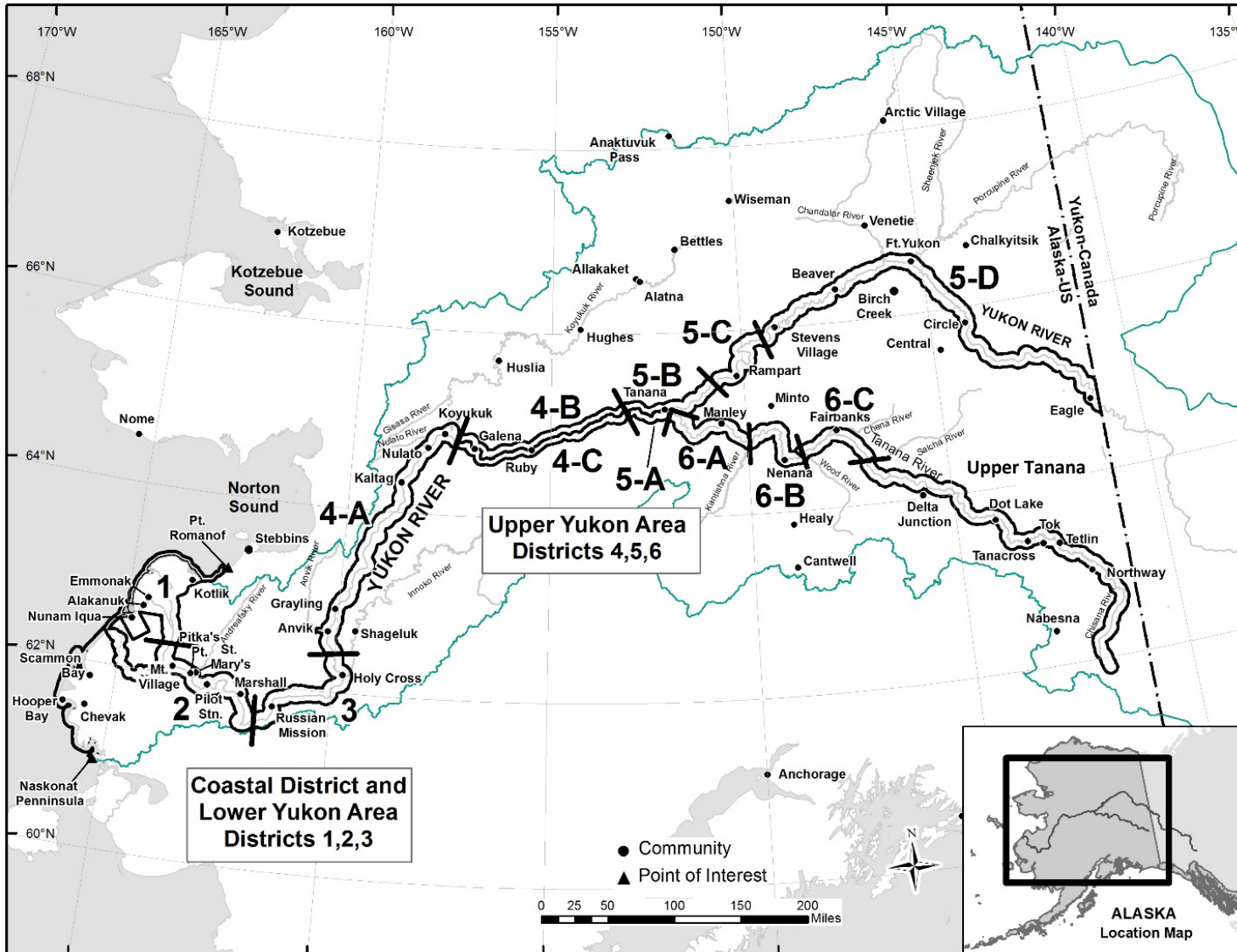


Figure 1.—Alaska portion of the Yukon River drainage showing communities and fishing districts.

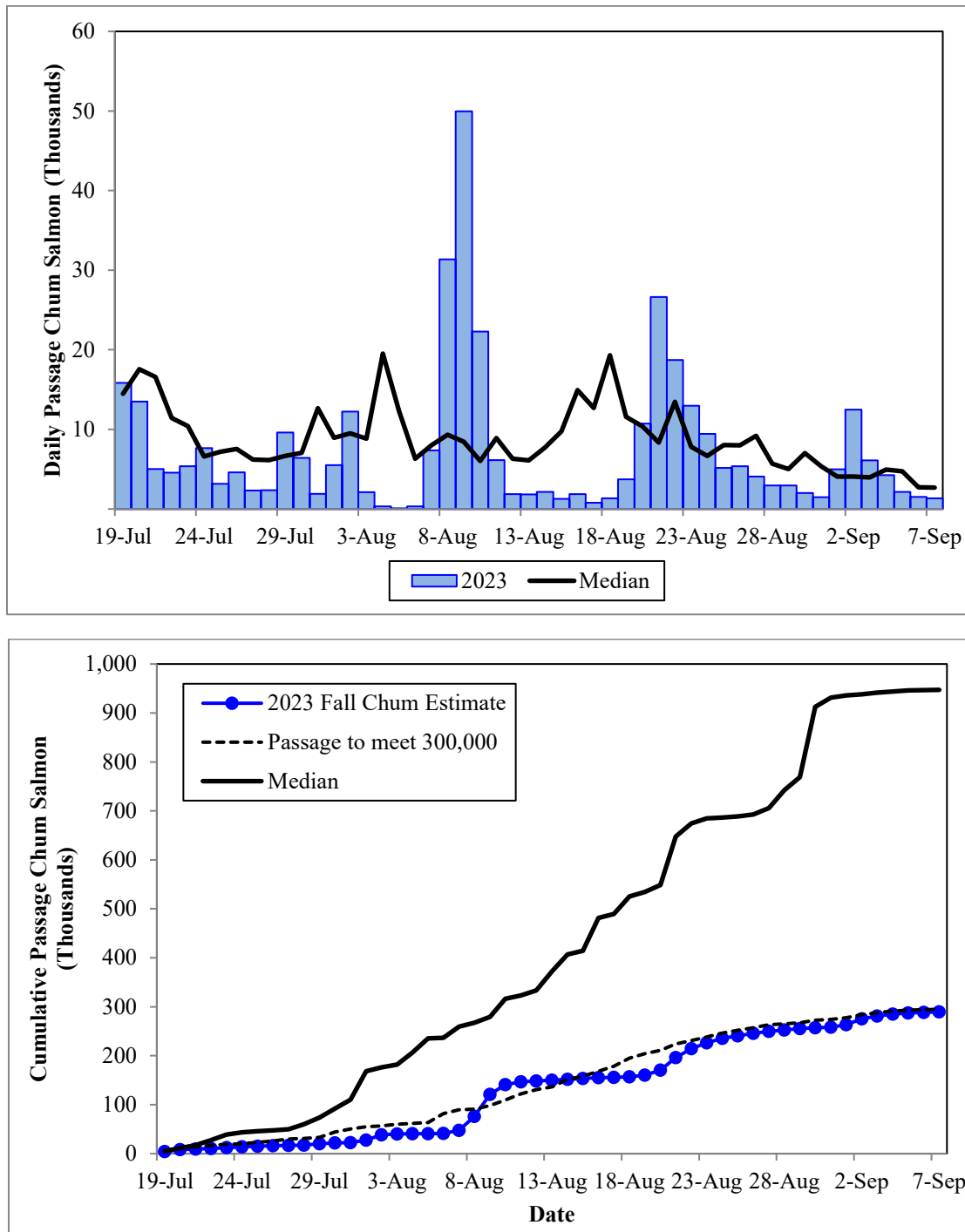


Figure 2.—Estimated daily passage of chum salmon (top) based on the Yukon River mainstem sonar (Pilot Station) and cumulative fall chum salmon based on genetics for 2023 (bottom), compared to historical (1995, 1997–2008, and 2010–2022) median run size. The dashed line is the passage required to meet the minimum management requirement of 300,000 fish to allow subsistence fishing.



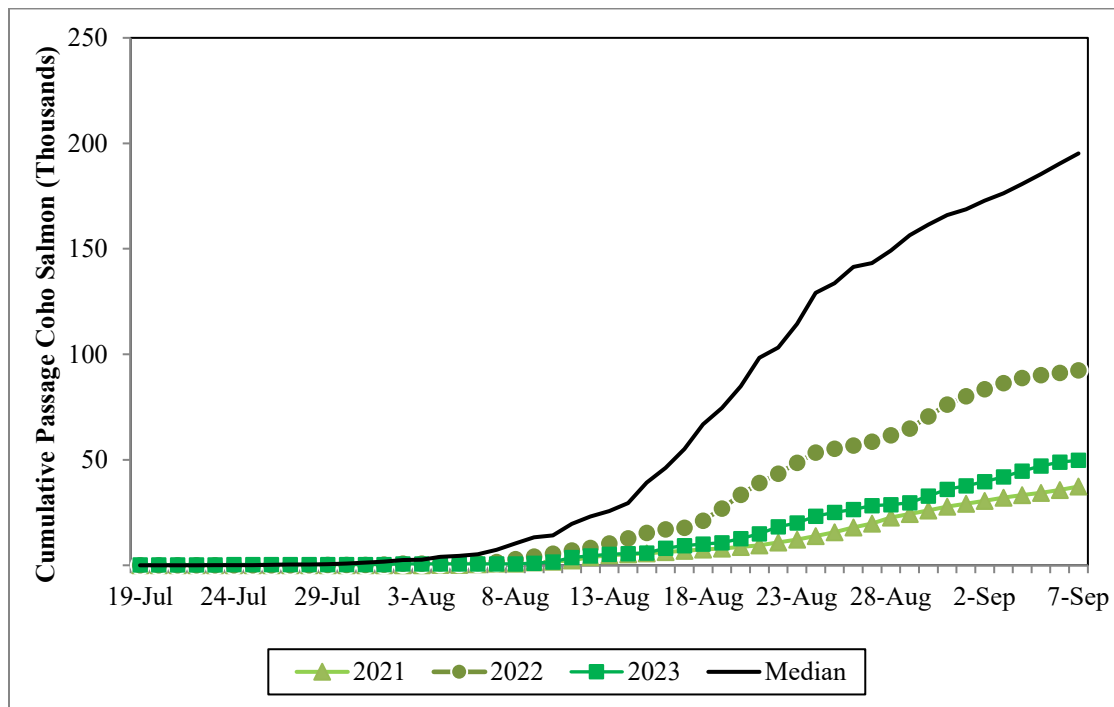
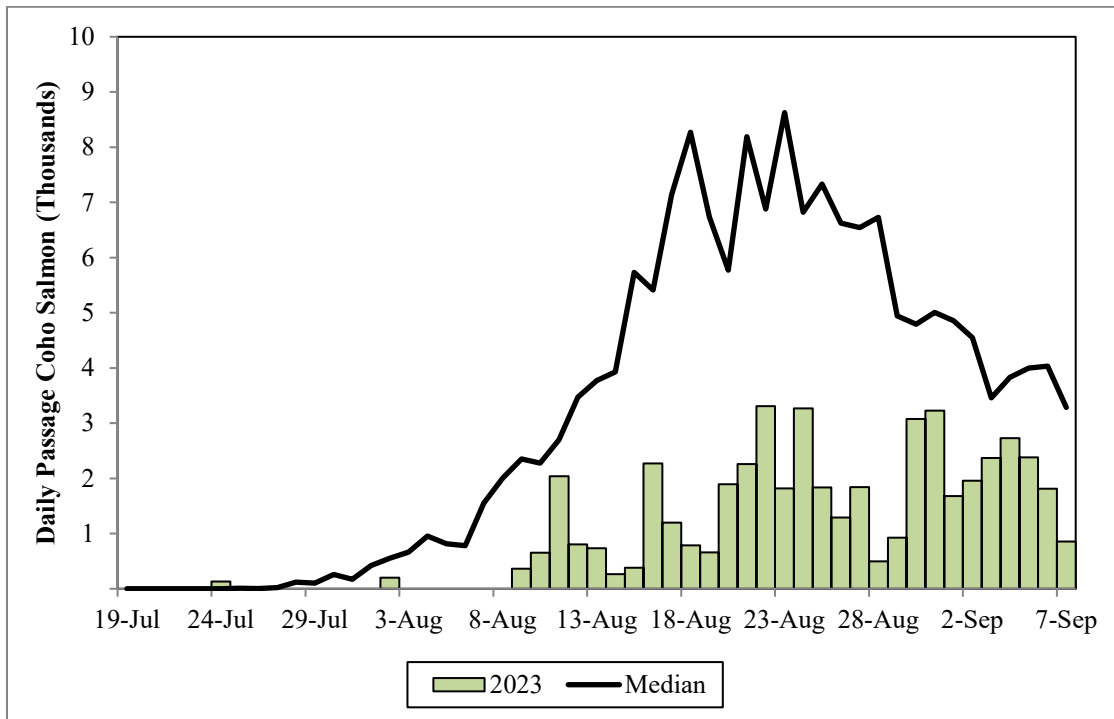


Figure 3.—Estimated daily passage of coho salmon (top) based on the Yukon River mainstem sonar (Pilot Station), 2023 compared to historical (1995, 1997–2008, and 2010–2022) median run size index. Cumulative passage of coho salmon (bottom) at the mainstem Yukon River sonar project (Pilot Station) in 2023 compared to historical median, 2021, and 2022.

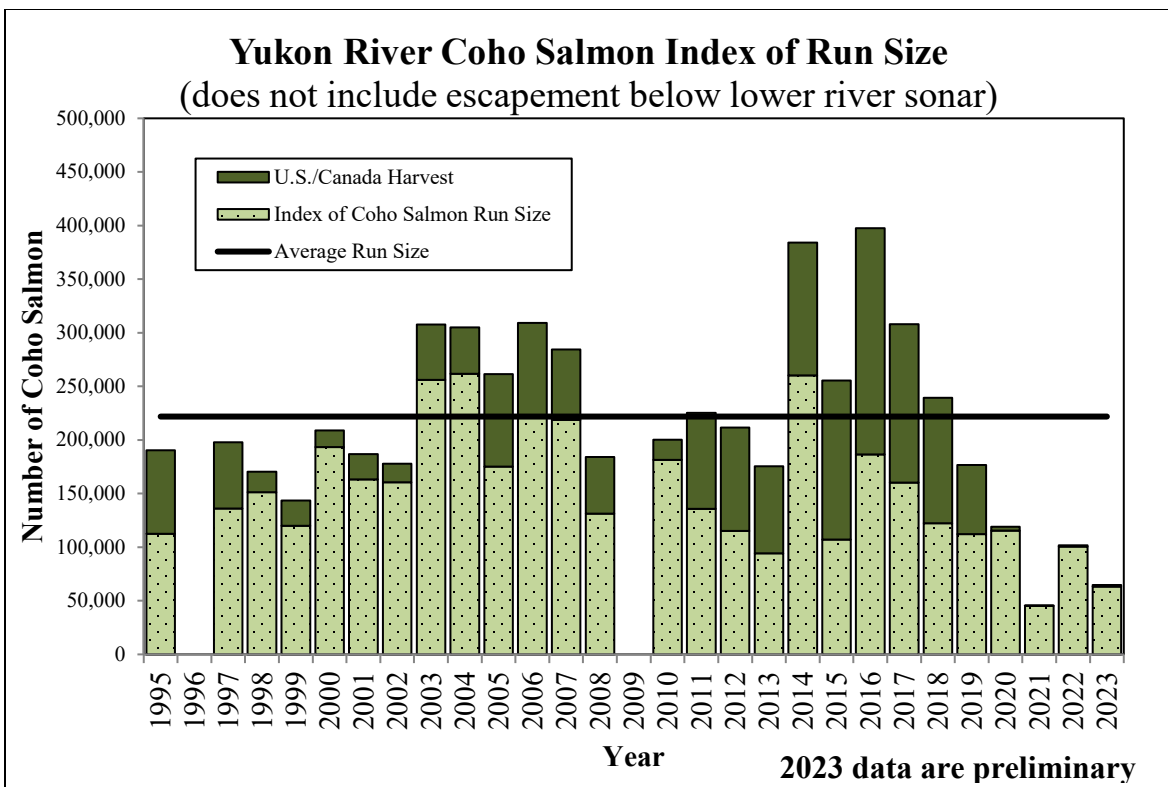
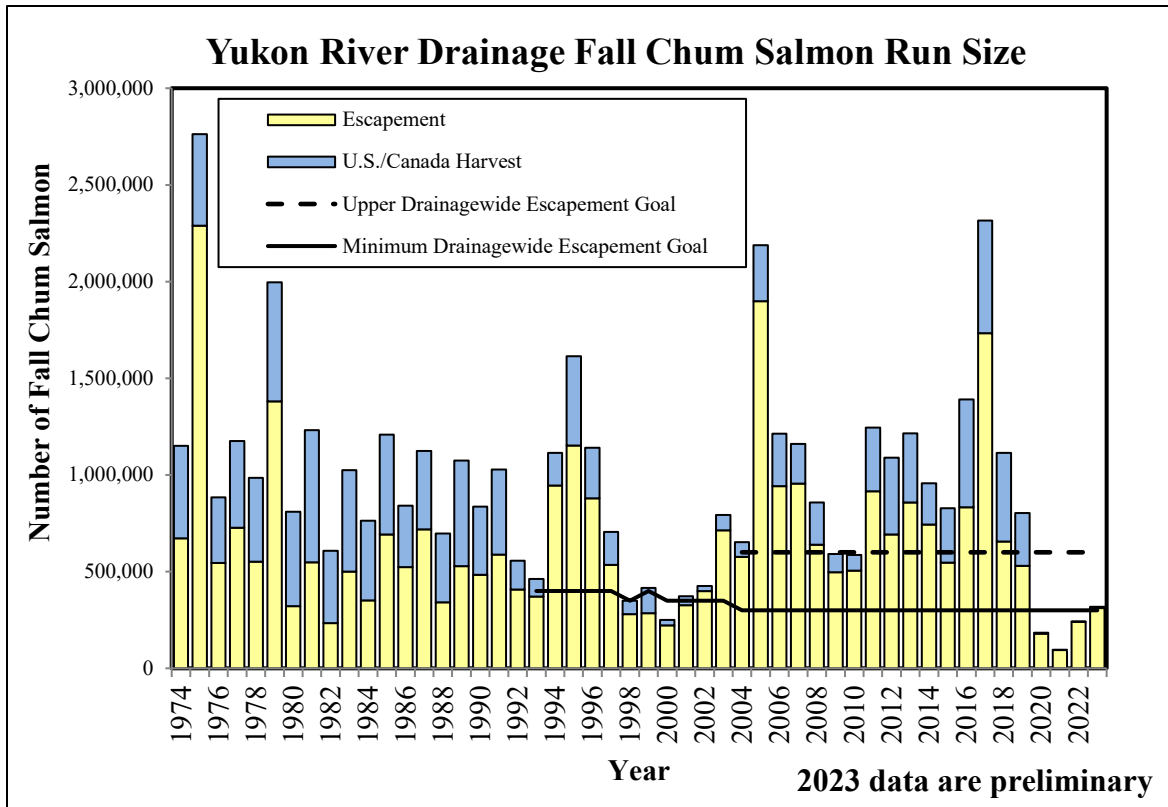


Figure 4.—Estimated drainagewide run size of fall chum salmon (top) and index of run size of coho salmon (bottom) in the Yukon River drainage.

Table 1.–Fall chum salmon subsistence harvest estimates by district, Yukon Area, 2003–2023.

Year	<i>Lower Yukon</i>					<i>Upper Yukon</i>				Yukon total
	Coastal	District 1	District 2	District 3	<i>Subtotal</i>	District 4	District 5	District 6	<i>Subtotal</i>	
2003	146	2,139	2,901	738	5,924	9,750	28,270	12,986	51,006	56,930
2004	320	2,067	2,421	298	5,106	7,797	40,670	8,953	57,420	62,526
2005	70	2,889	3,257	1,304	7,520	9,405	51,663	22,946	84,014	91,534
2006	187	3,902	4,015	480	8,584	6,335	52,158	16,925	75,418	84,002
2007	234	4,390	3,472	925	9,021	8,576	53,731	29,893	92,200	101,221
2008	386	2,823	3,522	1,821	8,552	7,412	57,258	16,135	80,805	89,357
2009	158	1,917	1,563	937	4,575	7,382	38,083	16,079	61,544	66,119
2010	186	3,202	1,419	1,325	6,132	6,788	44,334	11,391	62,513	68,645
2011	315	3,434	2,578	354	6,681	7,260	51,885	14,376	73,521	80,202
2012	11	7,622	3,332	637	11,602	18,055	54,350	15,302	87,707	99,309
2013	149	3,673	4,878	1,764	10,464	15,191	76,098	11,640	102,929	113,393
2014	252	4,072	5,817	2,457	12,598	15,936	51,197	12,798	79,931	92,529
2015	198	5,877	6,258	1,388	13,721	13,274	50,260	9,345	72,879	86,600
2016	762	4,572	4,539	997	10,870	10,034	58,831	4,882	73,747	84,617
2017 <sup>a</sup>	561	4,587	4,175	1,304	10,627	9,609	60,438	4,419	74,466	85,093
2018 <sup>a</sup>	525	3,680	3,004	706	7,915	5,779	44,891	5,909	56,579	64,494
2019 <sup>a</sup>	815	4,251	3,809	754	9,629	4,232	45,071	4,930	54,233	63,862
2020 <sup>a</sup>	671	1,594	937	26	3,228	369	1,897	202	2,468	5,696
2021 <sup>a</sup>	39	143	435	0	617	0	71	17	88	705
2022 <sup>a</sup>	236	1,166	432	25	1,859	86	815	18	919	2,778
2023 <sup>a</sup>	165	1,928	1,459	159	3,546	78	3,199	2	3,279	6,990
Average										
2013–2022	421	3,362	3,428	942	8,153	7,451	38,957	5,416	51,824	59,977
2018–2022	457	2,167	1,723	302	4,650	2,093	18,549	2,215	22,857	27,507

Source: Numbers of fish harvested are based on reports from OceanAK (accessed 1/10/2024), applicable annual footnotes are within the database.

<sup>a</sup> Values are preliminary until the project report is published.

Table 2.–Coho salmon subsistence harvest estimates by district, Yukon Area, 2003–2023.

Year	<i>Lower Yukon</i>					<i>Upper Yukon</i>				Yukon total
	Coastal	District 1	District 2	District 3	<i>Subtotal</i>	District 4	District 5	District 6	<i>Subtotal</i>	
2003	292	1,260	1,586	711	3,849	5,773	3,887	10,363	20,023	23,872
2004	63	1,175	1,500	284	3,022	4,766	1,423	11,584	17,773	20,795
2005	279	976	1,110	217	2,582	2,971	2,159	19,538	24,668	27,250
2006	335	1,177	2,459	83	4,054	1,302	3,779	10,571	15,652	19,706
2007	110	2,265	2,347	739	5,461	2,952	3,366	7,845	14,163	19,624
2008	116	1,211	1,997	410	3,734	1,490	3,203	8,428	13,121	16,855
2009	246	847	1,057	321	2,471	3,986	2,498	7,051	13,535	16,006
2010	124	1,122	557	353	2,156	1,730	3,604	5,555	10,889	13,045
2011	55	1,127	823	36	2,041	2,072	1,389	6,842	10,303	12,344
2012	93	3,350	1,346	556	5,345	3,556	3,092	9,540	16,188	21,533
2013	287	1,224	1,080	371	2,962	4,940	1,298	5,257	11,495	14,457
2014	204	1,782	1,769	340	4,095	3,062	2,030	7,911	13,003	17,098
2015	174	2,100	3,002	428	5,704	1,941	2,462	8,000	12,403	18,107
2016	355	1,231	1,131	140	2,857	826	861	4,271	5,958	8,815
2017 <sup>a</sup>	435	1,046	1,263	497	3,241	529	1,007	2,525	4,061	7,302
2018 <sup>a</sup>	871	966	595	154	2,586	1,545	1,343	53	2,941	5,527
2019 <sup>a</sup>	804	1,962	643	232	3,641	497	612	1,069	2,178	5,819
2020 <sup>a</sup>	350	552	494	20	1,416	136	196	591	923	2,339
2021 <sup>a</sup>	50	36	126	0	212	0	31	53	84	296
2022 <sup>a</sup>	291	289	284	30	894	108	29	59	196	1,090
2023 <sup>a</sup>	295	708	359	74	1,141	5	32	3	40	1,476
Average										
2013–2022	382	1,119	1,039	221	2,761	1,358	987	2,979	5,324	8,085
2018–2022	473	761	428	87	1,750	457	442	365	1,264	3,014

Source: Numbers of fish harvested are based on reports from OceanAK (accessed 1/10/2024), applicable annual footnotes are within the database.

<sup>a</sup> Values are preliminary until the project report is published.

Table 3.–Fall chum salmon commercial harvest by district, Yukon Area, 2003–2023.

Year	<i>Lower Yukon</i>				<i>Upper Yukon</i>				Yukon total
	District 1	District 2	District 3	<i>Subtotal</i>	District 4	District 5	District 6	<i>Subtotal</i>	
2003	5,586	–	–	5,586	1,315	–	4,095	5,410	10,996
2004	660	–	–	660	–	–	3,450	3,450	4,110
2005	130,525	–	–	130,525	–	–	49,637	49,637	180,162
2006	101,254	39,905	–	141,159	–	1,667	23,353	25,020	166,179
2007	38,852	35,826	–	74,678	–	427	15,572	15,999	90,677
2008	67,704	41,270	–	108,974	–	4,556	5,967	10,523	119,497
2009	11,911	12,072	–	23,983	–	–	1,893	1,893	25,876
2010	545	270	–	815	–	–	1,735	1,735	2,550
2011	127,735	100,731	–	228,466	–	1,246	10,917	12,163	240,629
2012	139,842	129,284	–	269,126	811	2,419	17,336	20,566	289,692
2013	106,588	106,274	–	212,862	–	1,041	24,148	25,189	238,051
2014	51,829	59,138	–	110,967	–	1,264	3,368	4,632	115,599
2015	100,562	74,214	–	174,776	–	1,048	15,646	16,694	191,470
2016	226,576	213,225	–	439,801	–	7,542	18,053	25,595	465,396
2017	328,410	134,668	–	463,078	1,402	1,952	23,270	26,624	489,702
2018	198,950	170,645	–	369,595	596	896	16,698	18,190	387,785
2019	145,692	106,141	–	251,833	–	900	15,627	16,527	268,360
2020	–	–	–	–	–	–	–	–	–
2021	–	–	–	–	–	–	–	–	–
2022	–	–	–	–	–	–	–	–	–
2023	–	–	–	–	–	–	–	–	–
Average									
2013–2022	165,515	123,472	NA	288,987	999	2,092	16,687	19,064	308,052
2018–2022	172,321	138,393	NA	310,714	NA	898	16,163	17,359	328,073

Note: En dash indicates no commercial fishing occurred. NA indicates insufficient information to generate average.

Table 4.–Coho salmon commercial harvest by district, Yukon Area, 2003–2023.

Year	<i>Lower Yukon</i>				<i>Upper Yukon</i>				Yukon total
	District 1	District 2	District 3	<i>Subtotal</i>	District 4	District 5	District 6	<i>Subtotal</i>	
2003	9,757	–	–	9,757	–	–	15,119	15,119	24,876
2004	1,583	–	–	1,583	–	–	18,649	18,649	20,232
2005	36,533	–	–	36,533	–	–	21,778	21,778	58,311
2006	39,323	14,482	–	53,805	–	–	11,137	11,137	64,942
2007	21,720	21,487	–	43,207	–	–	1,368	1,368	44,575
2008	13,946	19,248	–	33,194	–	91	2,408	2,499	35,693
2009	5,992	1,577	–	7,569	–	–	742	742	8,311
2010	1,027	1,023	–	2,050	–	–	1,700	1,700	3,750
2011	45,335	24,184	–	69,519	–	–	7,502	7,502	77,021
2012	39,757	29,063	–	68,820	0	634	5,335	5,969	74,789
2013	27,304	31,456	–	58,760	–	0	7,439	7,439	66,199
2014	54,804	48,602	–	103,406	–	0	1,286	1,286	104,692
2015	66,029	54,860	–	120,889	–	0	8,811	8,811	129,700
2016	113,669	67,208	–	180,877	–	54	20,551	20,605	201,482
2017	95,982	33,277	–	129,259	0	0	9,656	9,656	138,915
2018	65,431	40,845	–	106,276	0	0	4,314	4,314	110,590
2019	40,621	15,622	–	56,243	–	0	2,348	2,348	58,591
2020	–	–	–	–	–	–	–	–	–
2021	–	–	–	–	–	–	–	–	–
2022	–	–	–	–	–	–	–	–	–
2023	–	–	–	–	–	–	–	–	–
Average									
2013–2022	66,263	41,696	NA	107,959	0	8	7,772	7,780	115,738
2018–2022	53,026	28,234	NA	81,260	NA	0	3,331	3,331	84,591

Note: En dash indicates no commercial fishing occurred. NA indicates insufficient information to generate average.

Table 5.–Value of fall chum and coho salmon commercial salmon fishery, 2003–2023.

Year	Fall Chum					Coho					Value by Species		Value by Area		
	Lower Yukon		Upper Yukon			Lower Yukon		Upper Yukon			Fall Chum	Coho	Lower	Upper	Total
	\$/lb	Value	\$/lb	\$/lb Roe	Value	\$/lb	Value	\$/lb	\$/lb Roe	Value					
2003	0.15	5,993	0.10	–	3,398	0.25	18,168	0.05	–	5,095	9,391	23,263	24,161	8,493	32,654
2004	0.25	1,126	0.05	–	848	0.25	2,774	0.06	–	6,372	1,974	9,146	3,900	7,220	11,120
2005	0.32	316,698	0.14	–	48,159	0.32	83,793	0.12	–	19,182	364,857	102,975	400,491	67,341	467,832
2006	0.20	202,637	0.14	–	33,806	0.20	50,299	0.19	–	11,137	236,443	61,436	252,936	44,943	297,879
2007	0.27	144,256	0.20	–	16,907	0.39	127,869	0.20	–	1,368	161,163	129,237	272,125	18,275	290,400
2008	0.55	428,969	0.27	–	22,089	0.97	216,777	0.20	–	3,717	451,058	220,494	645,746	25,806	671,552
2009	0.70	108,778	0.19	–	1,286	1.00	52,176	0.15	–	457	110,064	52,633	160,954	1,743	162,697
2010	1.00	5,428	0.23	–	2,761	1.50	20,535	0.26	–	442	8,189	20,977	25,963	3,203	29,166
2011	1.00	1,627,575	0.22	–	16,114	1.00	472,168	0.15	–	6,792	1,643,689	478,960	2,099,743	22,906	2,122,649
2012	0.75	1,385,550	0.22	–	28,354	1.25	534,523	0.22	–	7,428	1,413,904	541,951	1,920,073	35,782	1,955,855
2013	0.75	1,154,203	0.16	–	25,744	1.10	453,998	0.17	–	7,115	1,179,947	461,113	1,608,201	32,859	1,641,060
2014	0.75	621,975	0.25	–	8,156	1.00	706,665	0.38	–	2,380	630,131	709,045	1,328,640	10,536	1,339,176
2015	0.60	762,142	0.14	–	15,683	0.70	616,617	0.12	–	6,877	777,825	623,494	1,378,759	22,560	1,401,319
2016	0.68	2,093,566	0.14	–	22,477	1.00	1,143,844	0.13	–	15,540	2,116,043	1,159,384	3,237,410	38,017	3,275,427
2017	0.60	2,038,232	0.15	1.75	29,176	1.00	814,580	0.15	2.00	8,778	2,067,408	823,358	2,852,812	37,954	2,890,766
2018	0.78	2,113,454	0.13	–	17,933	1.00	677,205	0.15	–	3,688	2,131,387	680,892	2,790,659	21,620	2,812,279
2019	0.60	1,054,751	0.17	–	18,395	1.00	336,578	0.21	–	2,371	1,073,146	338,949	1,391,329	20,766	1,412,095
2020	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2021	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2022	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2023	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Average															
2013–2022	0.68	1,405,475	0.16	NA	19,652	0.97	678,498	0.19	NA	6,678	1,425,127	685,176	2,083,973	26,330	2,110,303
2018–2022	0.69	1,584,103	0.15	NA	18,164	1.00	506,891	0.18	NA	3,029	1,602,267	509,921	2,090,994	21,193	2,112,187

Note: En dash indicates no commercial fishing occurred. NA indicates insufficient information to generate average.

Table 6.—Number of participating commercial salmon fishing gear permit holders making at least one delivery for fall chum or coho salmon by district and season, Yukon Area in Alaska, 2003–2023.

Year	Lower Yukon Area				Upper Yukon Area				Yukon Area
	District 1	District 2	District 3	Subtotal <sup>a</sup>	District 4	District 5	District 6	Subtotal <sup>b</sup>	total
2003	75	0	0	75	2	0	5	7	82
2004	26	0	0	26	0	0	6	6	32
2005	177	0	0	177	0	0	7	7	184
2006	219	71	0	286	0	4	11	15	301
2007	181	122	0	300	0	2	8	10	310
2008	251	177	0	428	0	3	8	11	439
2009	165	130	0	292	0	0	2	2	294
2010	72	18	0	90	0	0	4	4	94
2011	234	169	0	395	0	2	5	8	403
2012	266	201	0	457	4	3	5	13	462
2013	251	197	0	436	0	1	6	7	443
2014	256	199	0	441	0	2	2	4	445
2015	266	184	0	440	0	1	5	6	446
2016	275	197	0	459	0	4	4	8	467
2017	318	144	0	438	5	4	4	13	451
2018	284	172	0	448	4	3	3	10	458
2019	276	136	0	404	0	3	4	7	411
2020	–	–	–	–	–	–	–	–	–
2021	–	–	–	–	–	–	–	–	–
2022	–	–	–	–	–	–	–	–	–
2023	–	–	–	–	–	–	–	–	–
Average									
2013–2022	275	176	0	438	1	3	4	8	446
2018–2022	280	154	0	426	2	3	4	9	435

<sup>a</sup> The Lower Yukon Area subtotal is the unique number of permits fished in Districts 1, 2, and 3 as fishers may transfer between districts during the season.

<sup>b</sup> Sum of Districts 4, 5, and 6 averages may not equal Upper Yukon Area district subtotal due to rounding error.



Table 7.–Fall chum salmon passage or escapement estimates for selected spawning areas, Yukon River drainage, 2003–2023.

Year	Alaska							Canada			
	Yukon River drainagewide escapement estimate	Tanana River drainage		Upper Yukon River drainage		Yukon River mainstem (Eagle) passage estimate	Mainstem escapement estimate	Porcupine River sonar	Fishing Branch River		
		Delta River	Tanana River estimate	Teedriinjik (Chandalar) River	Sheenjek River						
a	b	c	d	e	f	g	h	i			
2003	713,150	22,582	263,302	221,343	44,047	j	–	143,133	k	–	29,713
2004	576,000	25,073	187,409	169,848	37,878		–	154,080	k	–	20,417
2005	1,898,000	28,132	372,758	526,838	561,863	l	–	437,733	k	–	119,058
2006	942,600	14,055	233,193	254,778	160,178	l	245,290	220,898	k	–	30,954
2007	955,200	18,610	357,016	243,805	65,435	l	265,008	236,987	k	–	32,150
2008	639,450	23,055	264,200	178,278	50,353	l	185,409	167,898		–	19,086
2009	497,600	13,492	159,828	150,000	54,126	l	101,734	93,626		–	25,828
2010	505,600	17,993	212,660	167,532	22,053		132,930	117,789		–	15,773
2011	916,450	23,639	270,846	298,223	97,976	l	224,355	205,566		–	13,085
2012	692,600	9,377	102,096	205,791	104,701	l	153,248	137,662		–	22,399
2013	857,700	31,955	275,089	252,710	130,000	q	216,791	200,262		35,615	–
2014	743,200	32,480	215,393	226,489	51,000	q	172,887	156,796		17,244	–
2015	545,800	33,401	149,265	164,486	64,000	q	125,095	109,505		21,397	8,351
2016	833,500	21,913	199,102	295,023	180,000	q	161,027	145,267		54,395	29,397
2017	1,733,500	48,783	525,293	509,115	250,000	q	419,099	401,585		67,818	48,524
2018	656,150	39,641	302,013	170,356	81,000	q	168,798	154,126		–	10,151
2019	529,300	51,748	189,882	116,323	91,000	q	113,266	99,738		27,447	18,171
2020	178,400	9,854	81,761	–	–		23,512	23,512		–	4,785
2021	94,500	1,613	42,818	21,162	13,000	q	21,162	23,170		3,486	2,413
2022	239,687	5,670	142,000	69,333	13,957		22,075	22,059		3,804	2,695
2023	<sup>s</sup> 311,697	13,366	121,000	136,551	15,958		21,627	22,090		15,654	11,528
Average											
2013–2022	641,174	27,706	212,262	202,777	97,106		144,371	133,602		28,901	15,561
2018–2022	339,607	21,705	151,695	94,294	49,739		69,763	64,521		11,579	7,643
SEG Range	300,000	7,000	–	85,000	–		–	> 80,000		<sup>v</sup>	50,000
	600,000	20,000		234,000							120,000 <sup>v</sup>
Interim Management Escapement Goal								70,000–104,000	<sup>w</sup>	22,000–49,000	<sup>x</sup>

-continued-

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*Note:* En dash indicates no data were collected or calculated.

- <sup>a</sup> Escapement estimates 2003–2021 are derived from Bayesian State-Space model as posterior medians. The distribution of stocks was highly variable in 2022 and 2023 compared to normal, so drainagewide escapements were based on observed escapements for upper Yukon and mixed stock analysis for the Tanana River components.
- <sup>b</sup> Population estimate generated from replicate foot surveys and stream life data using AUC (area-under-curve) method unless otherwise indicated.
- <sup>c</sup> Fall chum salmon passage estimate based on mark-recapture projects operated from 1995–2007 on the upper Tanana River and from 1999–2007 on the Kantishna River minus harvests, unless otherwise noted.
- <sup>d</sup> Split beam sonar estimate (1995–2006). DIDSON sonar (2007-present). Includes expansions to the beginning end of the run.
- <sup>e</sup> Single beam sonar estimate (2000–2002), split beam sonar estimate (2003–2004), DIDSON sonar (2005–2012).
- <sup>f</sup> Sonar estimates include an expansion for fish that may have passed after operations ceased through October 18, except 2018 was expanded through October 23 for an extremely late run.
- <sup>g</sup> Estimated mainstem Canadian escapement derived from mark-recapture project minus Canadian mainstem harvest and excluding Canadian Porcupine River drainage escapement, unless otherwise noted.
- <sup>h</sup> Porcupine River Sonar is located near Canadian border, downstream of community of Old Crow. Includes expansions to the end of the run.
- <sup>i</sup> Weir located within the Canadian portion of the Porcupine River drainage. Late season adjustments have been made for the period when weir was not operating for most years.
- <sup>j</sup> Project ended on peak daily passage in 2003 due to late run timing, estimate was expanded based on run timing (87%) at Rapids.
- <sup>k</sup> Estimated mainstem Yukon River Canadian escapement derived from mark-recapture project minus Canadian mainstem harvest.
- <sup>l</sup> BEG based on right bank only. Inseason right bank counts include 266,963, 106,397, 39,548, 35,912, 28,480, 49,080, and 72,746 in 2005 through 2009 and 2011 to 2012 respectively.
- <sup>m</sup> Tanana River estimate is based on regression of Delta River 1995–2006 with estimate for Tanana River (Kantishna 1999–2007 and Upper Tanana 1995–2007 based on mark-recapture).
- <sup>n</sup> Project ended early, estimate based on regression of Chandalar to Fishing Branch River plus Mainstem Border from 1995–2009.
- <sup>o</sup> Peak counts from foot surveys unless otherwise noted.
- <sup>p</sup> Preliminary estimate based on regression of Tanana with mainstem Yukon River Canada from 1995 to 2012 excluding 2005 from 2013–2017.
- <sup>q</sup> Preliminary estimate based on regression of Fishing Branch River weir counts (1985–2012) to Sheenjek estimates from two bank operations in 1985–1987, 2005 to 2009, and 2011 to 2012 and remaining years were expanded using average 36% for second bank operations.
- <sup>r</sup> Preliminary estimate based on mixed stock analysis minus harvest in the Tanana River.
- <sup>s</sup> Data are preliminary.
- <sup>t</sup> Escapement goal revised to a sustainable escapement goal in 2019 based on percentile method.
- <sup>u</sup> Tanana escapement goal range of 61,000–136,000 was discontinued 2019, Sheenjek escapement goal 50,000–104,000 was discontinued in 2016.
- <sup>v</sup> Escapement goal as written in the Pacific Salmon Treaty.
- <sup>w</sup> Interim Management Escapement Goal (IMEG) range of 70,000 to 104,000 was established for 2010 to present is based on Canadian stock Ricker model.
- <sup>x</sup> IMEG established 2008 and is based on percentile method.

Table 8.–Coho salmon passage or escapement estimates for selected spawning areas, Yukon River drainage, 2003–2023.

Year	Yukon River index of drainagewide escapement <sup>a</sup>	Nenana River Drainage				Upper Tanana River Drainage		
		Lost Slough	Nenana Mainstem <sup>b</sup>	Wood Creek	Seventeen Mile Slough	Delta Clearwater River <sup>c</sup>	Clearwater Lake and Outlet	Richardson Clearwater River
2003	256,001	85 (h)	658 (h)	3,055 (h)	4,535 (h)	102,800 (b)	8,800 (b)	6,232 (h)
2004	261,845	220 (h)	450 (h)	840 (h)	3,370 (h)	37,550 (b)	2,925 (b)	8,626 (h)
2005	175,268	430 (h)	325 (h)	1,030 (h)	3,890 (h)	34,293 (b)	2,100 (b)	2,024 (h)
2006	223,236	194 (h)	160 (h)	634 (h)	1,916 (h)	16,748 (b)	4,375 (b)	271 (h)
2007	218,871	63 (h)	520 (h)	605 (h)	1,733 (h)	14,650 (b)	2,075 (b)	553 (h)
2008	131,184	1,342 (h)	1,539 (h)	578 (h)	1,652 (h)	7,500 (b)	1,275 (b)	265 (h)
2009	– <sup>d</sup>	410 (h)	–	470 (h)	680 (h)	16,850 (b)	5,450 (b)	155 (h)
2010	181,415	1,110 (h)	280 (h)	340 (h)	720 (h)	5,867 (b)	813 (b)	1,002 (h)
2011	135,914	369 (h)	–	–	912 (h)	6,180 (b)	2,092 (b)	575 (h)
2012	115,094	–	106 (h)	–	405 (h)	5,230 (b)	396 (h)	515 (h)
2013	94,389	721 (h)	–	55 (h)	425 (h)	6,222 (b)	2,221 (h)	647 (h)
2014	260,251	333 (h)	378 (h)	649 (h)	886 (h)	4,285 (b)	434 (h)	1,941 (h)
2015	106,988	242 (h)	1,789 (h)	1,419 (h)	3,890 (h)	19,533 (b)	1,621 (h)	3,742 (h)
2016	186,399	334 (h)	1,680 (h)	1,327 (h)	2,746 (h)	6,767 (b)	1,421 (h)	1,350 (h)
2017	160,214	1,278 (h)	862 (h)	2,025 (h)	1,942 (h)	9,627 (b)	–	–
2018	122,391	1,822 (h)	241 (h)	361 (h)	347 (h)	2,884 (b)	2,465 (h)	976 (h)
2019	112,176	–	749 (h)	184 (h)	424 (h)	2,043 (b)	258 (h)	300 (h)
2020	115,387	28 (h)	206 (h)	231 (h)	507 (h)	2,557 (b)	210 (h)	475 (h)
2021	45,213	126 (h)	104 (h)	226 (h)	213 (h)	913 (b)	130 (h)	17 (h)
2022	100,541	–	–	–	–	1,750 (b)	101 (h)	57 (h)
2023 <sup>e</sup>	63,241	–	–	–	–	1,794 (b)	–	–
Average								
2013–2022	130,395	611	751	720	1,264	5,658	985	1,056
2018–2022	99,141	659	325	251	373	2,029	633	365

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*Note:* Only peak counts presented. Survey rating is fair to good, unless otherwise noted. Denotations of survey methods include (b)=boat and (h)=helicopter. En dash indicates no data available.

- <sup>a</sup> Index of drainagewide escapement based on Pilot Station sonar, which is expanded by portion of the run missed using nearby test fisheries, plus harvest below sonar site, then subtracts total drainage harvest to estimate escapement. Does not include the escapements to the Andreafsky River (East Fork was monitored 1995–2005 and averaged 8,000 coho salmon).
- <sup>b</sup> Index area includes mainstem Nenana River between confluences of Lost Slough and Teklanika River.
- <sup>c</sup> Index area is lower 17.5 miles of system. Sustainable escapement goal (SEG) of 5,200–17,000 was discontinued in 2023. A BEG of greater than 9,000 fish was used from 1993 to 2003.
- <sup>d</sup> Could not be derived as extreme low water levels were experienced in 2009, affecting species apportionment at Pilot Station sonar, which is the basis of this index.
- <sup>e</sup> Data are preliminary.