



Advisory Announcement

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2022 Yukon River Salmon Summer Fishery Announcement #19

2022 Yukon River Summer Season Summary

Districts Affected: Yukon Area

The following is a summary of the 2022 Yukon River Chinook and summer chum salmon fisheries. All data reported here are considered preliminary. For management purposes, the Yukon River is divided into several fishing districts and subdistricts (Figure 1). The “summer season” refers to management of Chinook and summer chum salmon runs (May through July 15 in District 1). Management converts to “fall season” in District 1 on July 16, and the transition continues upriver as the fall chum arrive in each District. Data presented in this summary applies to “summer season” species only. The summer season management team consists of Alaska Department of Fish and Game (ADF&G) area management and research biologists and the Federal subsistence fishery management staff from U.S. Fish and Wildlife Service (USFWS).

Preseason Forecast and Management Strategy

The 2022 preseason outlooks for both Chinook and summer chum were for low run abundance and warranted a cautious management approach: 99,000 to 150,000 Chinook salmon, and 162,000 to 542,000 summer chum salmon. Directed fishing for both species was considered unlikely. The management team met preseason to form the strategy based on outlooks and public input. The Yukon River Panel and Yukon River Drainage Fisheries Association hosted preseason planning meetings in April. The preseason outlook, management strategies and research results were presented with time for discussion and questions. Fishermen from throughout the drainage discussed management options and concerns about environmental factors, bycatch, fish diseases, food security, and project operations. Additionally, there was discussion about the temporary Federal Special Action Requests proposing federal management of federal waters on the Yukon River for 2022 salmon season, which was adopted by the Federal Subsistence Board in early May.

The preseason salmon management plan, including harvest strategies, was distributed in April as Advisory Announcement #01 and an Outlook Flier was mailed to households. Due to the poor projected salmon run sizes, the summer season started with all salmon fishing closed, including subsistence, commercial, sport and personal use. Closures began in the lower river districts and were announced upriver based on salmon travel time. Subsistence fishing for nonsalmon species remained open in all areas of the Yukon River with 4-inch or smaller mesh gillnets that were limited to 60 feet maximum length.

Inseason Assessment Overview

Lower Yukon Test Fishery (LYTF)

Ice-out occurred on May 15 on the Yukon River near Emmonak, which is 4 days earlier than average (2001–2021). The LYTF program is designed to assess salmon run timing and strength as Catch Per Unit Effort (CPUE), which gives an index of abundance and indicates the presence of large groups of fish or “pulses” entering the

mouths of the river. Operations were conducted by ADF&G technicians and Yukon Delta Fishery Development Association (YDFDA) crew. The two established locations are Middle Mouth (upstream from the confluence of Middle Mouth and North Mouth) and Big Eddy (on South Mouth). The driftnet operations began June 2 at Big Eddy and June 3 at Middle Mouth while the Big Eddy setnet began June 5. The Big Eddy setnet was fished through July 12 and both driftnet sites operated through July 15.

Since 2020, the Middle Mouth set gillnet has been replaced by an 8.25-inch mesh drift gillnet operation. This change was made in order to reduce the number of Chinook mortalities from the Test fishery. The drift gillnet mesh size at Middle Mouth matches the Chinook salmon drift gear at the Big Eddy site and allows the department to compare the CPUE data from both locations. At Big Eddy, operations were the same as they were in past years; drift gillnets for Chinook salmon (8.25-inch mesh) and summer chum salmon (5.5-inch mesh), and an 8.5-inch mesh setnet.

Water temperatures were collected during fishing operations and recorded by HOBO loggers. Water temperatures in mid-June were above average for several days, but below historic maximums (Figure 2).

Chinook salmon

The Big Eddy set net had a cumulative CPUE of 6.29; roughly 32% of the historical total. The Big Eddy drift net had a cumulative CPUE of 109.62, which was 29% of the historical average (367.76). The Middle Mouth drift gillnet CPUE was 13.90 which is 19% of the historical average (73.06). The combined (Big Eddy and Middle Mouth) drift CPUE was 47.09; which was lower than the historic average CPUE values of 64.89. Due to conservation concerns, fish were released alive whenever possible. In 2022, 111 Chinook salmon were retained for sampling, compared to around 900 Chinook salmon retained on an average year. The number of fish retained is due to the small run sizes and low abundance. Additionally, when test fish catches are low, crews are able to retrieve and release fish alive quickly due to there being few salmon in the net to untangle.

Research projects included partnerships with Tribes, Universities, and other programs, and samples consisted of fecundity, lipids, muscle, kidney, pyloric caeca, intestine, otoliths, and age, sex, length data (ASL). It is important to note that while mesh sizes have been consistent across years, catch in the large mesh gear is biased toward older, larger fish.

Summer Chum

Big Eddy-Middle Mouth combined drift net was 800.43 cumulative CPUE, which was well below the historical median of 6,708.64.

For summer chum salmon, 393 fish were sampled and distributed to local communities. This is 10% of average number sampled and distributed, which reflects the low abundance of salmon. The test fish donation program was coordinated with village Tribal Councils and with the assistance of YDFDA.

Pilot Station Sonar

Pilot Station sonar is located at river mile 123 and provides abundance estimates and run timing information for Chinook and summer chum salmon and a variety of nonsalmon species. The test fishery at the sonar project is used to apportion the daily sonar counts by species and is also used to sample the salmon runs for ASL and genetic data. The project uses a wide range of mesh sizes (2.75, 4.0, 5.0, 5.25, 6.5, 7.5, and 8.5 inches) and likely captures a representative sample across sizes and age classes.

The Pilot Station sonar project estimated the first Chinook salmon passed the sonar site on June 3, which is average for years 2001–2021. This year the run was 4 days later than average, with the midpoint of the run occurring on June 28th. The preliminary 2022 total run sizes for Chinook and summer chum salmon were well below the recent 5- and 10-year averages (Figures 3 and 4).

The cumulative passage estimate at the Pilot Station sonar was 48,439 Chinook salmon (with a 90% confidence interval of 41,060 to 55,818 fish), which was 20% of the average run size (2002–2021). A total of 380 Chinook salmon were encountered in the test fishery and approximately 200 were distributed to households.

The Chinook salmon age composition from 327 samples that were aged from the drift gillnet test fishery at the Pilot Station sonar project (all mesh sizes combined) was 12% age-4, 36% age-5, 46% age-6, and 6% age-7. Females comprised 53% of all fish sampled (including un-ageable samples). The age composition for age-5 fish was below the recent 10-year average. However, all other age classes were above the recent 10-year average with percent female also above average. Chinook salmon encountered at Pilot Station sonar were 719 mm, well below average (742 mm) and the smallest on record (1995–present). Females were primarily age-6 and males were primarily age-5.

Genetic mixed stock analysis (MSA) at the Pilot Station Sonar site indicated a declining percentage of Canada-origin Chinook salmon through the run. The early group of Chinook salmon (June 1 to June 22) indicated that 67% of the fish sampled were Canada-origin. The sampling of first and second pulse of Chinook salmon at the sonar (June 23 to June 29) indicated that 42% of the fish were Canada-origin. Genetic MSA on the third pulse and remaining groups of Chinook salmon sampled at the sonar (June 30 to July 27) indicated that 35% of the fish sampled were of Canada-origin with a weighted season total of 45% Canada-origin Chinook salmon, approximately 21,600 fish. These are higher percentages than average, but coupled with an extremely small total run, these percentages do not accurately reflect the strength of the Canada run of Chinook salmon. For more background information on genetic MSA for Yukon River Chinook salmon, please refer to the department's Gene Conservation Laboratory webpage¹.

Three pulses of summer chum salmon were detected at the sonar project; the largest group consisted of approximately 202,000 fish and passed by the sonar between June 25 and July 2. The first quarter point, midpoint, and third quarter point at the Pilot Station sonar were June 27, July 2, and July 12, respectively. This indicated that the summer chum salmon run was likely 4 days later than average and one of the latest on record based on the midpoint at the sonar project.

An estimated 463,806 summer chum salmon were counted at the Pilot Station sonar (with a 90% confidence interval of 438,989 to 488,623 fish), which was well below the historical median of 1.6 million fish from years with late run timing. This is the fourth lowest count on record, with previous lowest counts of 153,718 in 2021; 442,546 in 2001, and 448,665 in 2000. A total of 363 summer chum salmon were caught, sampled, and distributed, while 968 were caught and released alive.

While traditionally summer management transitions to fall management staff on July 16 in the lower river to align with the arrival of the fall chum salmon, in 2022 85% of the chum salmon arriving through July 28 at Pilot Station sonar were genetically summer chum salmon. Even though MSA indicated a high proportion of summer chum salmon were present during the first two weeks of the fall season, the administrative cut-off date for summer and fall chum is July 16 in District 1 and July 18 at the Pilot Station sonar. These dates are used to maintain consistency with historical data sets, and in any given year the proportions of summer chum still passing in the fall season varies. The 2022 total summer chum salmon run abundance estimated at Pilot Station is likely a conservative estimate. Total run size and evaluation of the drainagewide escapement goal is conducted postseason using a statistical run reconstruction model, which uses data inputs from a range of mainstem and tributary assessment projects.

Eagle Sonar

The Eagle sonar operated from July 1 to October 6, with an estimated passage of 12,025 Chinook salmon, which is 80% lower than the historical average. A small amount of harvest may have occurred incidentally in nonsalmon gear between the sonar project and border. The final border passage estimate will not be available until later this

¹ http://www.adfg.alaska.gov/index.cfm?adfg=fishinggeneconservationlab.yukonchinook_baseline

winter after all harvest permits have been returned. However, the Interim Management Escapement Goal (IMEG) of 42,500 to 55,000 Chinook salmon was not met. The test fish project encountered 134 Chinook salmon. Live fish were released and 50 fish were sampled for the *Ichthyophonous* project and distributed equally to the community of Eagle and Native Village of Eagle and to First Nations Tribes in Canada.

The Chinook salmon age composition from 327 samples that were aged from the test fishery at the Eagle sonar project was 6% age-4, 42% age-5, 48% age-6, and 4% age-7 fish. The age composition of all age classes were similar to the recent 10-year average with percent female also similar to the recent 10-year average. Average length of all Chinook salmon encountered at Eagle was 761mm, the second smallest on record (2006, 736mm). The average length for females (820 mm) was similar to the recent 10-year average.

Similar to last year, fewer Canada-origin Chinook salmon were counted at the Eagle sonar than were assessed at the Pilot Station Sonar. In 2022, this difference between estimates was approximately 9,000 fish, or 43% of the Canada-origin run as assessed by MSA at Pilot Station sonar. Numerous research and assessment projects are examining this loss of fish along the river and seeking to understand factors affecting Chinook salmon migration inriver.

Escapement Projects

Most assessment projects operated as normal in 2022, however the Henshaw Weir (Tanana Chiefs Conference) was not operated this year due to necessary repairs. The East Fork Andreafsky weir (USFWS) was not operated due to forest fires early in the season and high-water levels preventing weir deployment.

There were no escapement goals met this year for Chinook or summer chum salmon (Table 1 and Table 2).

Three escapement goals exist for summer chum salmon: a drainage-wide goal of 500,000–1,200,000 fish and goals at the East Fork Andreafsky River and the Anvik River (Table 2). The drainagewide summer chum salmon goal is assessed postseason by incorporating information from harvest, escapement and Pilot Sonar estimates into a run reconstruction model. Subsistence harvest estimates will be available later this winter. Based on preliminary information, the lower end of the drainagewide goal was not met. Summer chum salmon counts at the other projects (, Chena and Salcha River sonars) were well below the historic medians (Table 2).

Anvik Sonar (ADF&G) operated from June 15 to July 26 and counted 46,436 summer chum salmon (escapement goal 350,000-700,000), which is well below the historic average of 455,876 fish.

Gisasa River weir (USFWS), also had trouble with high water but operated from June 30 through July 29. End of season counts are 503 Chinook salmon, which was much lower than the historical average of 2,075 fish. The summer chum salmon count was 3,300 which is well below the historical median of 44,502 fish.

Chena and Salcha rivers escapement projects are operated by ADF&G Sport fish division and were unable to run sonar during the 2022 season due to technical difficulties. The Chena River counting tower operated visually for the entire season, July 2-August 5. The final estimates for Chinook and summer chum salmon were 355 fish (standard error (SE) 39) and 897 fish (SE 69). Carcass trips occurred on August 8–11 but only 8 Chinook and 1 summer chum salmon were encountered. The Salcha River operated from July 2 through August 18. There was a high-water event that prevented visual counts from July 11–19. The preliminary estimates of the Salcha River escapement project are 1,041 Chinook salmon (SE 57) and 1,237 summer chum salmon (SE 82). Samples taken from carcasses on both rivers included eggs, muscle tissue, livers and eDNA for research partners (ADF&G Commercial Fisheries division, USGS, Knik Tribe and UAF).

Aerial surveys of the East and West Forks of the Andreafsky River, Anvik River, and Nulato River were conducted under various conditions but very few fish were observed, and counts were well below average.

Ichthyophonous

Subsistence fishers reported increasing presence of *Ichthyophonus* in 2020 and in 2021 prompting concerns for survival of upriver migrating Chinook salmon. In 2021, ADF&G conducted a pathology study at the Pilot Station sonar and USFWS evaluated samples from subsistence harvested Chinook salmon near Rapids. Combined, the agencies data indicated the percentage of Yukon River Chinook salmon infected with *Ichthyophonus* was likely well above the 25% threshold level identified by the Joint Technical Committee warranting focused research to understand the biological impacts of the disease. In 2022, ADF&G and USFWS partnered to conduct a multi-year *Ichthyophonus* study to evaluate the prevalence and intensity of the disease and to attempt to understand how many fish could be dying inriver prior to spawning. Three locations were used to collect samples in 2022, Pilot Station and Eagle sonar projects, and Rampart Rapids. Preliminary results show an increased occurrence and disease burden in Chinook salmon this year. The project may continue for 2 additional years and full results will be shared when available.

Subsistence Fishery Overview

Closures began on June 2 in the Coastal District and District 1 and progressed upriver based on run timing (Table 3). During the salmon fishing closures, fishermen could use nonsalmon gear, including hook and line with a rod or pole (up to and including the Nulato River), hand line, longline, fyke net, dip net, and spear. Gillnets of 4-inch or smaller mesh were restricted to 60 feet in length. Nonsalmon fishing opportunities remained open 24 hours a day, seven days a week throughout the entire summer season. Fishermen were asked to release all Chinook and summer chum salmon alive from selective and nonsalmon gear whenever possible, and to avoid fishing in areas where salmon could be caught. Pink and sockeye salmon could be retained all season. As the season progressed, inseason abundance estimates remained low and did not indicate a harvestable surplus of Chinook or summer chum salmon.

Despite full subsistence salmon fishery closures, a small number of Chinook and summer chum salmon are known to be harvested incidentally in 4-inch mesh subsistence gear. Harvest estimates will be available postseason and are expected to be similar to 2021, with an estimated harvest of 1,000–2,000 Chinook and summer chum salmon.

Commercial Fishery

Due to very poor Chinook and summer chum salmon abundance and subsistence fishery closures, no commercial periods occurred. Based on the recent 10-year average commercial harvest of 380,016 summer chum salmon, the Yukon River commercial fishing closure represents a loss of \$1.4 million dollars to the region (Appendices A and B). For the fourteenth consecutive year, no commercial periods targeting Chinook salmon were allowed in the Yukon Management Area.

Canadian Fisheries

The preseason outlook was for a run size of approximately 41,000 to 62,000 Canada-origin Chinook salmon. Fishery Managers at the Department of Fisheries and Oceans Canada (DFO) implemented Canadian Chinook salmon fisheries according to International (i.e. Pacific Salmon Treaty; Yukon River Salmon Agreement) and Domestic allocation provisions outlined in Canada's Yukon River Integrated Fisheries Management Plan (IFMP). Based on the preseason information and the in-season estimates at Pilot Station sonar suggesting a run below the preseason forecast, and taking into consideration escapement goals, harvest shares, and the IFMP, the Chinook salmon run was considered to have no available harvest allocation. The recreational, commercial, and domestic Fisheries were closed. As the season developed and it became progressively apparent that the passage at Eagle sonar would be well below levels required to achieve spawning escapement objectives, DFO asked First Nations to manage their fisheries accordingly as no harvest share was available (i.e. "Red" zone). DFO maintained the closures in the recreational, commercial, and domestic fisheries throughout the 2022 Chinook salmon run. While not all information is currently available, due to low numbers of Chinook salmon and measures taken by First Nations, the indication is that First Nation harvest on the Mainstem Yukon River is expected to be minimal.

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. For information regarding Federal subsistence fishing regulations contact Holly Carroll at 907-351-3029.



To reach the USFWS Yukon River Subsistence Fishery Manager call Holly Carroll at 907-351-3029.

Federal Special Actions are posted on www.doi.gov/subsistence/fisheries-special-actions and shared on Facebook at www.facebook.com/subsistencealaska.

ADF&G Advisory Announcements are posted on www.cfnews.adfg.alaska.gov/ and shared on Facebook at www.facebook.com/YukonRiverFishingADFG.



Table 1.—Escapement goals and passage estimates for Chinook salmon at selected Yukon River tributaries, 2022.

Project	Current Goal	Type of Goal	Historical Average ^a	Estimate
Eagle Sonar	42,500–55,000	IMEG	54,000	12,025 ^b
Pilot Station Sonar	—	—	152,793	48,439
East Fork Andreafsky Weir	2,100 - 4,900	SEG	3,885	—
Henshaw Creek Weir	—	—	1,093	—
Chena River Tower	2,800–5,700	BEG	5,890	355
Salcha River Tower	3,300–6,500	BEG	8,163	1,041
Sheenjek River Sonar	—	—	—	—
Gisasa River Weir	—	—	2,038	503

Note: En dash indicates no goal at the project. Chena and Salcha rivers were visual counts only.

^a Historical average includes all years the projects operated fully; years excluded have incomplete datasets due to weather and technical difficulties.

^b The passage estimate at Eagle Sonar is not an escapement estimate. Some harvest (U.S. and Canada) occurs between the project location and the spawning habitats.

Table 2. —Escapement goals and passage estimates for summer chum salmon at selected Yukon River tributaries, 2022.

Project	Current Goal	Type of Goal	Historical Median ^a	Estimate
Drainage-wide ^b	500,000–1,200,000	BEG	1,626,239	463,806
East Fork Andreafsky Weir	>40,000	SEG	52,947	—
Anvik Sonar	350,000 - 700,000	BEG	455,876	46,436
Henshaw Creek Weir	—	—	156,933	—
Sheenjek River Sonar	—	—	—	13,957
Chena River Tower	—	—	7,198	897
Salcha River Tower	—	—	22,484	1,982

Note: En dash indicates no escapement goal at the project. Chena and Salcha rivers were visual counts only.

^a Historical median includes all years the projects operated with the exclusion of years the projects operated poorly. Historical averages of aerial survey estimates are the recent 10 years.

^b Estimate of abundance at the Pilot Station sonar. Salmon fishing was closed above and below the sonar for the whole season, however small numbers of summer chum were harvested in nonsalmon gear and test fisheries. After accounting for harvest and escapements below the sonar, the lower end of the drainagewide goal will not be met.

Table 3.—Subsistence salmon management actions, 2022.

District or Subdistrict	Closure date
Coastal District	June 2
District 1	June 2
District 2	June 4
District 3	June 7
Innoko River	June 17
Koyukuk River	June 25
4-A Lower	June 12
4-A Upper	June 15
4-B and 4-C	June 17
5-A, 5-B, 5-C	June 21
5-D Lower	June 25
5-D Middle	June 28
5-D Upper	June 30
6-A	June 21
6-B and Old Minto	June 25
6-C	June 26
Upper Tanana	June 28
Kantishna	June 23
Lake Minchumina	Open 24/7: restricted to 6-inch for nonsalmon on June 23
Tolovana River and Minto Flats	Open 24/7: restricted to 6-inch for nonsalmon on June 23

Note: Salmon fishing remained closed through the end of the summer season in each district.

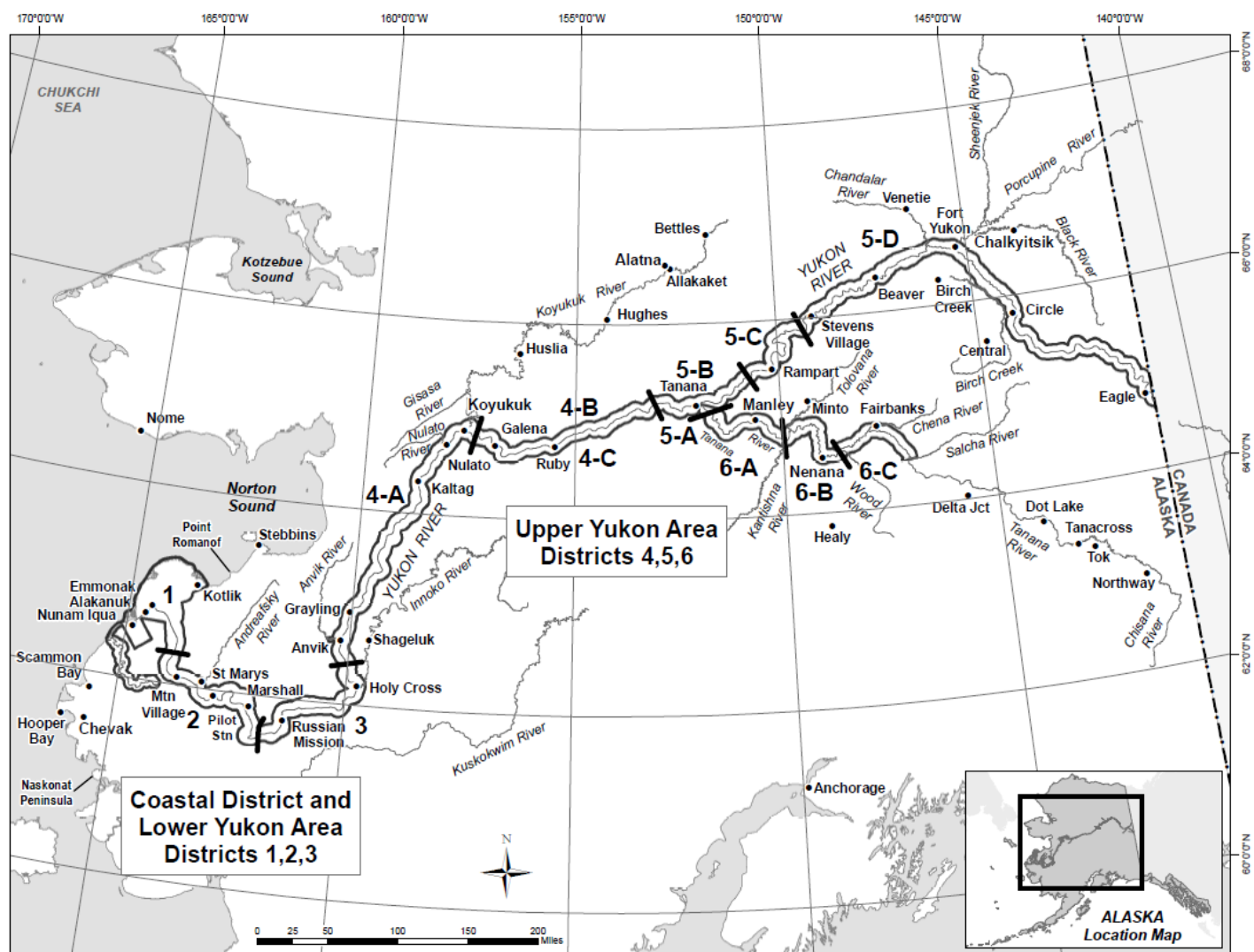


Figure 1.—Yukon Area communities and fishing districts.

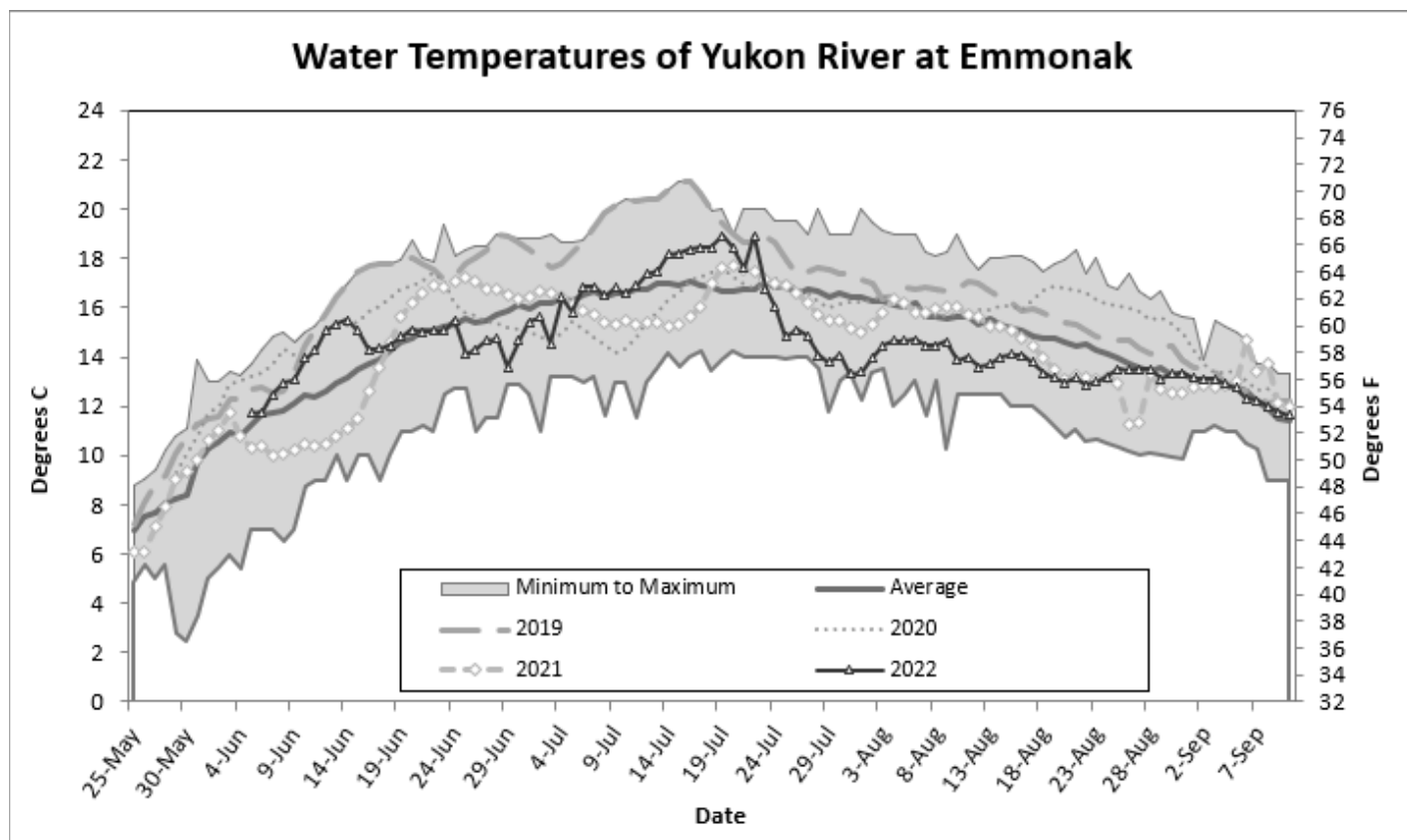


Figure 2.—Average daily water temperatures collected (from hand-held thermometers 1984–present and loggers 2004–2021) in the Yukon River near Emmonak, comparing 2022 and select years to historical minimum, maximum, and average temperatures. Measurements from 2022 were taken with a handheld thermometer and are preliminary.

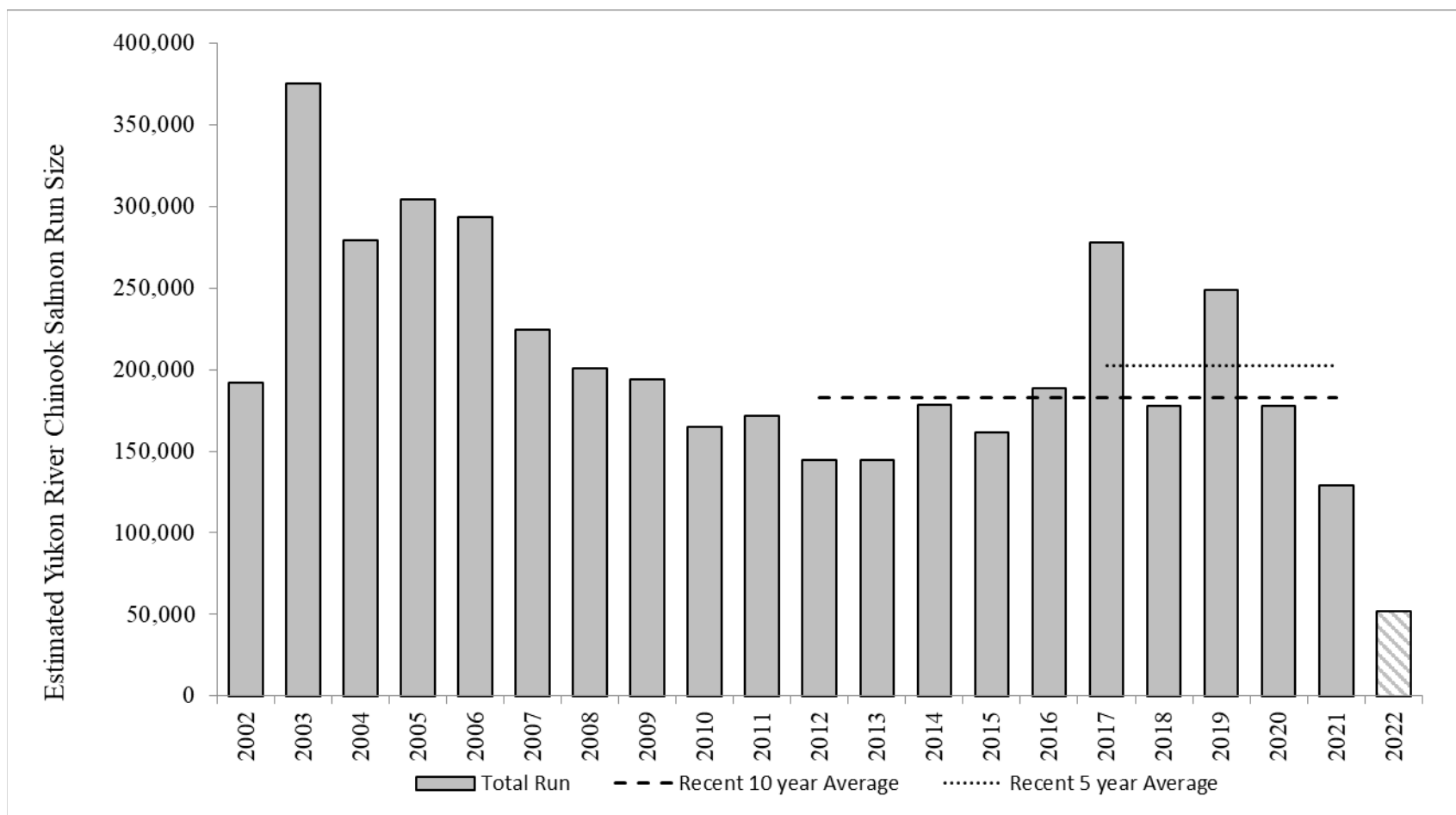


Figure 3.—Estimated Yukon River Chinook salmon run size based on Pilot Station sonar passage and test fishery harvest below Pilot Station.

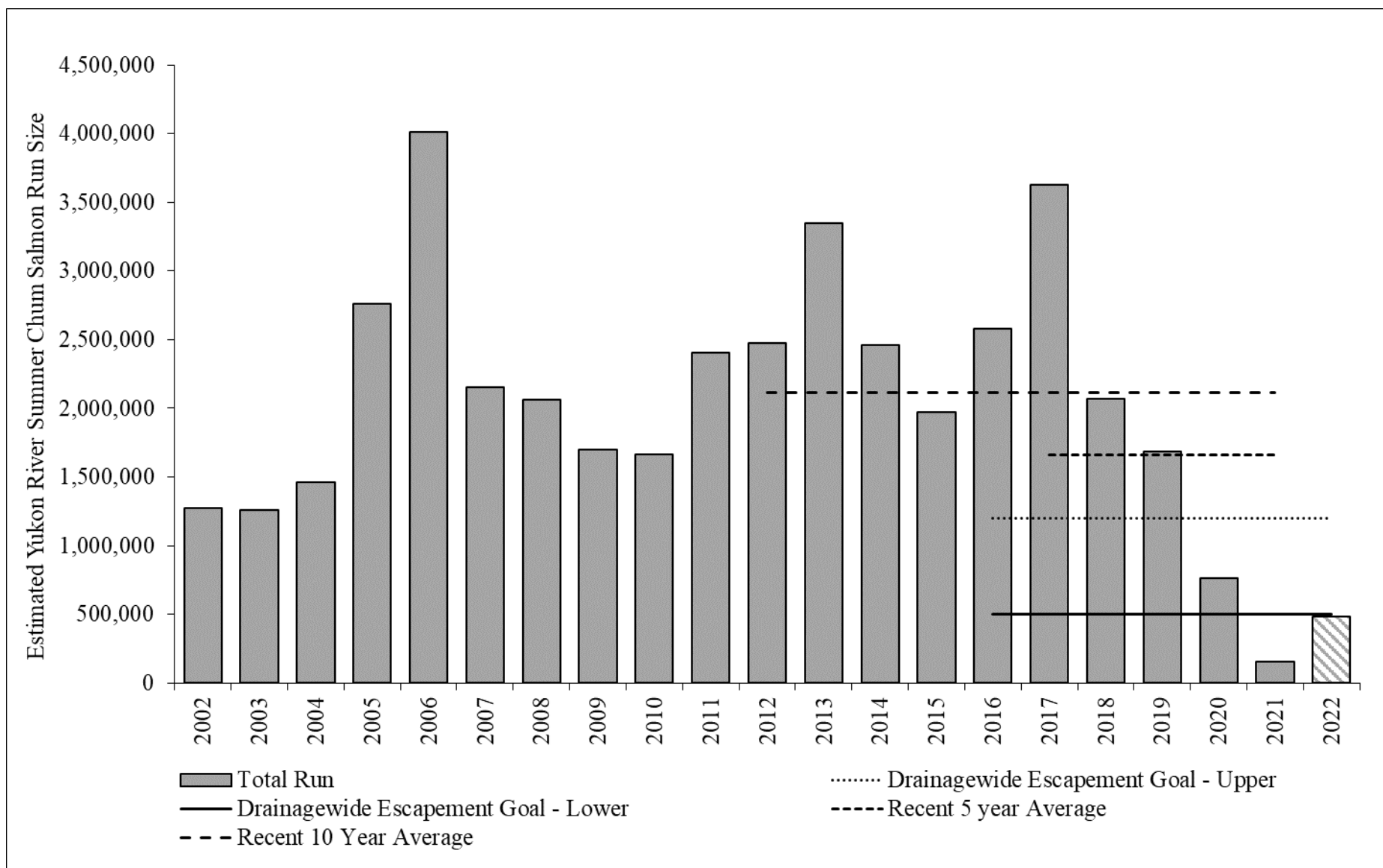


Figure 4.—Estimated Yukon River summer chum salmon run size based on Pilot Station sonar passage and test fishery harvest below Pilot Station.

Appendix A1.–Summer chum salmon commercial harvests by district for 2012–2022.

District/ Subdistrict	Guideline Harvest Range	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	5-yr Average (2017–2021)
District 1		207,871	198,240	172,639	293,522	345,395	250,958	183,658	9,613	–	–	197,406
District 2		171,272	229,107	181,447	228,267	47,770	195,423	41,835	4,355	–	–	72,346
Subtotal Districts 1– 2	251,000–755,000	379,143	427,347	354,086	521,789	393,165	446,381	225,493	13,968	–	–	269,752
Subdistrict 4- A	113,000–338,000	100,507	96,385	–	–	159,051	126,892	–	–	–	–	142,972
District 6	13,000–38,000	5,937	6,912	4,770	4,020	4,300	3,427	1,596	–	–	–	3,108
Total Districts 1-6	400,000– 1,200,000	485,587	530,644	358,856	525,809	556,516	576,700	227,089	13,968	–	–	343,568

Note: Commercial harvest only includes summer chum salmon sold in the round. No summer chum salmon were sold in Districts 3 and 5 from 2010–2022.

Appendix B1.—Value of commercial salmon fishery to Yukon Area fishermen, 2012–2022.

Year	Chinook		Summer Chum				Value by species		Value by area		Total	
	Lower Yukon		Lower Yukon		Upper Yukon		(dollars)		(dollars)		Yukon Area	
	\$/lb	Value (\$)	\$/lb	Value (\$)	\$/lb	Value (\$)	Chinook	Summer chum	Lower	Upper	(dollars)	
2012	—	—	0.75	980,424	0.37	137,817	—	1,118,241	980,424	137,817	1,118,241	
2013	—	—	0.75	1,721,524	0.3	152,110	—	1,873,634	1,721,552	a	152,110	1,873,662
2014	—	—	0.60	1,648,866	0.29	154,959	—	1,803,825	1,662,634	b	154,959	1,817,593
2015	—	—	0.60	1,259,908	0.23	7,166	—	1,267,074	1,262,034	b	7,166	1,269,200
2016	—	—	0.60	1,903,490	0.26	6,030	—	1,909,520	1,958,311	b	6,030	1,964,341
2017	—	—	0.60	1,470,353	0.34	276,682	—	1,747,035	1,470,353	c	276,682	1,747,035
2018	—	—	0.60	1,679,448	0.33	217,064	—	1,896,512	1,695,468	b	217,064	1,912,549
2019	6.59	210,079	0.60	820,654	0.29	2,819	210,079	807,367	1,034,117	c, d	2,819	1,036,936
2020	—	—	0.60	51,067	—	—	—	51,067	51,440	d	—	51,440
2021	—	—	—	—	—	—	—	—	—	—	—	—
2022	—	—	—	—	—	—	—	—	—	—	—	—
2017–2021 Ave.	6.59	210,079	0.60	1,005,380	0.32	165,522	210,079	1,125,495	1,062,844		165,522	1,186,990
2012–2021 Ave.	6.59	210,079	0.63	1,281,748	0.30	119,331	210,079	1,386,031	1,315,148		119,331	1,421,222

Note: En dash indicates no sales occurred or harvest level was insufficient to generate summary information.

^a Includes sales of coho salmon in Districts 1 and 2.

^b Includes sales of pink and coho salmon sold during the summer season in Districts 1 and 2.

^c Does not include value from Chinook salmon sold during fall season. Value of Chinook salmon sold in fall season was \$9,922 in 2017 and \$41,594 in 2019.

^d Includes sales of pink salmon in Districts 1 and 2.