

**DRAFT: Yukon River Fall Chum Salmon Stock
Status and Action Plan, 2026**

by

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Month Year

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Weights and measures (metric)		General		Mathematics, statistics	
centimeter	cm	Alaska Administrative Code	AAC	<i>all standard mathematical signs, symbols and abbreviations</i>	
deciliter	dL	all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.	alternate hypothesis	H_A
gram	g	all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.	base of natural logarithm	e
hectare	ha	at	@	catch per unit effort	CPUE
kilogram	kg	compass directions:		coefficient of variation	CV
kilometer	km	east	E	common test statistics	(F, t, χ^2 , etc.)
liter	L	north	N	confidence interval	CI
meter	m	south	S	correlation coefficient	
milliliter	mL	west	W	(multiple)	R
millimeter	mm	copyright	©	correlation coefficient	
		corporate suffixes:		(simple)	r
Weights and measures (English)		Company	Co.	covariance	cov
cubic feet per second	ft ³ /s	Corporation	Corp.	degree (angular)	°
foot	ft	Incorporated	Inc.	degrees of freedom	df
gallon	gal	Limited	Ltd.	expected value	E
inch	in	District of Columbia	D.C.	greater than	>
mile	mi	et alii (and others)	et al.	greater than or equal to	≥
nautical mile	nmi	et cetera (and so forth)	etc.	harvest per unit effort	HPUE
ounce	oz	exempli gratia		less than	<
pound	lb	(for example)	e.g.	less than or equal to	≤
quart	qt	Federal Information Code	FIC	logarithm (natural)	ln
yard	yd	id est (that is)	i.e.	logarithm (base 10)	log
		latitude or longitude	lat or long	logarithm (specify base)	log ₂ , etc.
Time and temperature		monetary symbols		minute (angular)	'
day	d	(U.S.)	\$, ¢	not significant	NS
degrees Celsius	°C	months (tables and figures): first three letters	Jan, ..., Dec	null hypothesis	H_0
degrees Fahrenheit	°F	registered trademark	®	percent	%
degrees kelvin	K	trademark	™	probability	P
hour	h	United States	U.S.	probability of a type I error	
minute	min	(adjective)		(rejection of the null hypothesis when true)	α
second	s	United States of America (noun)	USA	probability of a type II error	
		U.S.C.	United States Code	(acceptance of the null hypothesis when false)	β
Physics and chemistry		U.S. state	use two-letter abbreviations (e.g., AK, WA)	second (angular)	"
all atomic symbols				standard deviation	SD
alternating current	AC			standard error	SE
ampere	A			variance	
calorie	cal			population	Var
direct current	DC			sample	var
hertz	Hz				
horsepower	hp				
hydrogen ion activity	pH				
(negative log of)					
parts per million	ppm				
parts per thousand	ppt, ‰				
volts	V				
watts	W				

REPORT TO THE ALASKA BOARD OF FISHERIES

**DRAFT: YUKON RIVER FALL CHUM SALMON STOCK STATUS AND
ACTION PLAN, 2026**

by

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ABSTRACT

Yukon River fall chum salmon had previously been designated a stock of yield concern from 2001 through 2007. This was due to an inability to achieve expected yields above escapement needs during the period of 1998–2000 along with the expectation of a very low run in 2001. Runs improved after 2003, which led to the removal of the designation in 2007. Escapements have not achieved the lower bound the established drainagewide escapement goal range in the last 5 years (2020–2024). In response to guidelines established in the Policy for the management of sustainable salmon fisheries (SSFP), the Alaska Board of Fisheries designated Yukon River fall chum salmon (*Oncorhynchus keta*) as a stock of management concern based on recommendation of the Alaska Department of Fish and Game (department) in October 2025. A “management concern” is defined as “a concern arising from a chronic inability, despite use of specific management measures, to maintain escapements for a salmon stock within the bounds of the sustainable escapement goal (SEG), biological escapement goal (BEG), optimum escapement goal (OEG), or other specified management objectives for the fishery.” This action plan summarizes historical assessment of annual run size and describes the existing regulations and emergency order (EO) authority that the department follows to manage the Yukon River fall chum salmon run. Options are then presented for potential management actions for the subsistence, commercial, sport, and personal use fisheries, and describe current research projects that are being conducted. It also includes proposed criteria for future removal of the stock of concern status. Management actions have reduced harvest rates, however, fall chum salmon productivity remains poor and escapement goals have not been consistently achieved.

Keywords: Fall chum salmon, *Oncorhynchus keta*, Yukon River, stock of concern, sustainable salmon fisheries policy, Alaska Board of Fisheries.

INTRODUCTION

The *Policy for the Management of Sustainable Salmon Fisheries* (SSFP; 5 AAC 39.222) directs the Alaska Department of Fish and Game (department) to provide the Alaska Board of Fisheries (board) with reports on the status of salmon stocks and identify any salmon stocks that present a concern related to yield, management, or conservation during regular board meetings. A full report of the stock status was presented to the board at the Arctic/Yukon/Kuskokwim (AYK) board meeting held in November 2025 (Jallen et.al 2025). This report will provide a brief historical summary of the fall chum salmon (*Oncorhynchus keta*) stock status, in addition to describing the existing regulations and emergency order (EO) authority followed by the department to manage the Yukon River fall chum salmon. Potential management options and proposed criteria for future removal of the stock of concern designation will also be presented.

In response to guidelines established in the SSFP, the board designated 3 stocks of concern for Yukon River fall chum salmon at its September 2000 work session. Those were a stock of yield concern for fall chum salmon in the Yukon River drainage and a stock of management concern for fall chum salmon on the Toklat and Fishing Branch Rivers. A stock of yield concern is defined as “a concern arising from a chronic inability, despite the use of specific management measures, to maintain expected yields, or harvestable surpluses, above a stock’s escapement needs; a yield concern is less severe than a management concern.” A stock of management concern is defined as “a concern arising from a chronic inability, despite the use of specific management measures, to maintain escapements for a salmon stock within the bounds of the established escapement goal or management objectives for the fishery. The SSFP defines chronic inability as “the continuing or anticipated inability to meet expected yields over a 4 to 5 year period.” These determinations were originally based on low harvest and escapement levels from 1998–2000 and anticipated low harvest in 2001 (ADFG 2000). An action plan was subsequently developed by ADF&G (ADF&G 2000) and acted upon by the BOF in January 2001. During the 2004 board

meeting, the 2 management concern designations on the Toklat and Fishing Branch rivers stocks were removed. This was due to an updated biological escapement goal (BEG) for the Toklat River and management of the Fishing Branch River being directed by an annex to the Pacific Salmon Treaty, the U.S./Canada *Yukon River Salmon Agreement*, facilitated through the Yukon River Panel. Additionally, these stocks continued to be addressed by the overall fall chum salmon yield concern. Improved runs since the 2003 season ultimately led the board to remove the stock of yield concern designation in 2007. After over 10 years of relatively good Yukon River fall chum salmon returns, production declined unexpectedly in 2020, resulting in record low run abundances. The department has taken conservative management actions over the last 5 years to achieve the largest possible escapements given extremely poor run sizes of fall chum salmon. These actions have resulted in record low harvests levels. Annual harvests have been below 7,000 fish since 2020 (Table 1), compared to the 2010–2019 historical range of 74,000–578,000. Even with such small harvests, the Yukon River drainage fall chum salmon escapement goal of 300,000–600,000 was not achieved in any year from 2020–2024 (Table 2). If harvest had been reduced to zero during this timeframe, the drainagewide escapement goal would still not have been achieved. Based on this information and the departments recommendation, the board designated Yukon River fall chum salmon as, a stock of management concern at the October 2025 work session. The most recent 5-year escapements and yield estimates (2020–2024), and historical levels of yield or harvestable surpluses (harvests during the 10-year period from 2010 through 2019 were used as the historical basis for comparison) were considered in the current analysis and current recommendation concerning stock of concern status

STOCK ASSESSMENT BACKGROUND

Overview

The Yukon River is the largest river in Alaska and the fifth-largest drainage in North America. The river originates in British Columbia, Canada, within 30 miles of the Gulf of Alaska, and flows over 3,190 km (1,980 mi) through Yukon Territory, Canada, and Alaska, United States, before draining into the Bering Sea at the Yukon–Kuskokwim Delta. The area drained is approximately 832,700 km² (321,500 mi²), of which 195,200 mi² lies within Alaska (Figure 1). Except for a few fish taken in the adjacent coastal waters near the mouth (Kerkvliet 1986), only salmon of Yukon River origin are harvested in the Yukon management area (Ransbury et. al 2022).

Chum salmon are one of 5 Pacific salmon species that inhabit the Yukon River. They are made up of 2 genetically distinct runs: an early summer run, and a later fall run. Fall chum salmon exhibit later run timing (entering the river from mid-July to early September), and have a more robust body shape, with a larger body size (average weight is 7 to 8 pounds). They primarily spawn in the upper portion of the drainage in streams with significant groundwater upwelling. Major spawning areas include the Tanana, Porcupine, and Teedriinjik river drainages and various streams in Yukon Territory, Canada, including the mainstem Yukon River. Fall chum salmon run sizes are approximately 30% smaller than summer chum salmon.

The department, federal agencies, Department of Fisheries and Oceans (DFO) Canada, Native organizations, Yukon Delta Fisheries Development Association (YDFDA), and various organized groups of local researchers operate fall chum salmon stock assessment projects throughout the Yukon River drainage, which are used to inform fishery management decisions in the Alaska portion of the Yukon River drainage. Inseason run assessment includes run timing and relative abundance indices from test fisheries based on catch per unit effort (CPUE), which serves as a

platform for collecting age, sex, and length (ASL) composition, and tissue sampling for inseason genetic mixed stock analysis (MSA). Assessment projects such as sonar, weir, and tower counts enumerate passing fish (both salmon and nonsalmon), aerial surveys are also used to monitor escapement in tributaries. Additionally, fisheries are monitored using commercial CPUE and subsistence, personal use, and sport fisheries catch data for inseason and postseason estimates of total run size and determination of exploitation rates. Since 2020, there has been an additional focus on fish health, including Ichthyophonous monitoring, paralytic shellfish toxin screening, body condition assessments, and fecundity measures.

The Yukon River fall chum salmon run has been in a low abundance cycle that began in 2020 when there was a lack of age-4 fish returning from the 2016 parent year. The occurrence was widespread, affecting chum salmon stocks in all of western Alaska, including hatchery and wild stocks as far south as British Columbia. Since then, the Yukon Area stocks have been slower to recover than other areas, in part due to the long distances they must migrate within the Yukon River, both for outmigration and as returning adults. The run recovered from the previous low-abundance years that occurred between 1998 and 2001. From 2002 through 2019, fall chum salmon stocks averaged over 1 million fish, similar to run sizes of the past, with escapements within or exceeding the drainagewide goal range of 300,000 to 600,000. Since 2020, the drainagewide goal has not been achieved; however, in 2023, the 2 U.S. tributary escapement goals were achieved, but the 2 Canadian interim management escapement goals (IMEG; Mainstem Yukon and Fishing Branch River) were not. There is little difference in the average run abundance (1 million fish) between the 1974–1992 and 2002–2019 periods; although the annual run sizes in the latter period have been more variable. From 1974 through 1992, there was a prominent even/odd-year abundance cycle, where odd-numbered years were substantially larger; however, after 1993, the pattern changed. Since then, the years 1993, 2000, and 2021 were extremely low run years, with the largest runs occurring in 1995, 2005, and 2017. After 1993, and again after the recovery from the poor observed returns from 1998 to 2002, it became more common to have 3 consecutive years of high abundance.

PILOT STATION SONAR

Since 1995, the mainstem sonar project located near the community of Pilot Station (hereafter called Pilot Station sonar) has provided inseason estimates of salmon passage for Yukon River drainage fisheries management. This project produces the first estimation of fish passage in the Yukon River, located at river km 197 (Pfisterer et al. 2017). Resident freshwater species and all 5 Pacific salmon species are enumerated and then apportioned by species through test fishing with gillnets of various mesh sizes. Data quality and environmental events that complicate fish passage estimates are considered inseason to ensure accurate estimates.

Updated selectivity parameters for all species were developed after the 2015 season and are used for producing passage estimates inseason at the project (Pfisterer et al. 2017; Table 3). The daily passage estimates by species since 1995 were updated with these improved selectivity parameters. Estimates can be obtained from ADF&G, Division of Commercial Fisheries, and the Arctic–Yukon–Kuskokwim database management system (hereafter cited as AYKDBMS¹). The

¹ Arctic–Yukon–Kuskokwim Database Management System (AYKDBMS). 2006– . Alaska Department of Fish and Game, Division of Commercial Fisheries. Juneau, AK. https://www.adfg.alaska.gov/CF_R3/external/sites/aykdbms_website/Default.aspx (accessed October 18, 2025).

estimated passage of salmon at Pilot Station sonar is used inseason, along with historical run timing comparisons, to project the end-of-season run size. Managers then compare the run to the preseason projection and manage fisheries accordingly.

INSEASON MIXED STOCK ANALYSIS

Genetic samples from chum salmon are collected from the Pilot Station sonar test fishery and have been analyzed by the U.S. Fish and Wildlife Service (FWS) on a nearly weekly basis since 2004 (Flannery and Wenburg 2019). Initial estimates of stock composition provide the relative proportions between summer and fall chum salmon stocks that overlap in July. Additionally, genetic assessment is used to determine fall chum salmon stocks of U.S. and Canadian origin, which is also important information for inseason fishery management. The U.S. fall stocks are grouped into upper Yukon (predominantly Teedriinjik and Porcupine) and Tanana River, with Tanana River stock building later in the run. The Canadian stocks tend to migrate earlier in the season than the Tanana River stocks as well.

EAGLE SONAR

A sonar assessment project was established, on the mainstem Yukon River below the U.S./Canada border and downstream of the community of Eagle, to estimate the passage of king and fall chum salmon into Canada.² ASL information from test fishing at the Eagle sonar project may give reasonable estimates of the age class composition of the passage into Canada. The sonar site is ideal due to stable river bottom morphology and because king and fall chum salmon runs are clearly separated by time at this location. Inseason assessment of border passage is determined by subtracting the reported harvest between the sonar site and the U.S./Canada border. The passage estimate is used to assess border objectives agreed to within the *Yukon River Salmon Agreement* (Table 2).

Escapement

Fall chum salmon are discrete spawners, choosing areas of upwelling with relatively warmer water to incubate their eggs in a shorter time than summer chum salmon. Major fall chum salmon spawning areas are in the Tanana, Teedriinjik, and Porcupine river drainages, and within the Canadian portion of the mainstem Yukon River drainage (Figure 1). Most of the spawning areas for fall chum salmon within the drainage are assessed annually, and their relationship with the assessment at Pilot Station sonar estimates are highly correlated, greatly assisting inseason management.

In 2009, the drainagewide escapement goal was converted from a BEG (Eggers 2001) to an SEG of 300,000–600,000 fish (Fleischman and Borba 2009). Since 2014, a Bayesian state-space model has been used to determine the drainagewide escapement. Without the means to monitor these systems, the goal for the Toklat River was discontinued in 2010, the Sheenjek River goal, an upper Yukon River tributary, was discontinued in 2015, and the Tanana River goal was discontinued in

² Evidence suggests that Canada's Department of Fisheries and Oceans (DFO) fish wheel mark-recapture program (1982–2004) tended to underestimate the passage of Chinook salmon into Canada. Therefore, adoption of sonar as a more reliable method to estimate this number has dramatically improved estimates of escapement, exploitation rates, and brood year return information. Historical escapement goals were based on DFO fish wheels and are not directly comparable to present sonar-based escapement goals. Conversion factors have been developed to allow comparisons of escapement, exploitation rates, and brood-year return information to historical data, although this should be cautiously considered. In this report, Eagle sonar-based data (2005–2024) are emphasized because they are deemed most accurate.

2019 (Figure 1). The Teedriinjik and Delta River goals were updated in 2019 using the percentile method (Clark et al. 2014) and developed as SEGs from their former BEG status.

The current drainagewide SEG for fall chum salmon has not been met since 2019 (Table 2, Figure 2). The low end of the drainagewide escapement goal range has been 300,000 fall chum salmon since 2004 and was achieved all 16 years prior to 2020. Several individual tributary escapement goals are used for monitoring fall chum salmon. The Delta and Teedriinjik river escapement goal ranges were updated in 2019. The current Delta River SEG of 7,000–20,000 fall chum salmon was met 4 out of 6 years (2019–2024), the Teedriinjik River SEG of 85,000–234,000 fish was met 2 out of 5 years (2019 and 2021–2024; the project was not operated in 2020). The mainstem Canada IMEG of 70,000–104,000 fish was updated in 2010 and achieved all 10 years prior to 2020, and the Fishing Branch River IMEG of 22,000–49,000 fish was updated in 2008 and achieved 5 times (2009, 2012–2013, and 2016–2017; Table 2). Neither Canadian fall chum salmon IMEGs have been achieved in the last 5 years (2020–2024). In 2025, none of the 5 fall chum salmon goals were achieved. (Table 5).

Harvest

Estimates of subsistence harvests of fall chum salmon were stable from 1979 to 1992, with an average of 180,000 fish harvested annually. Fall chum salmon was used for both human and dog food throughout the migration route in Alaska. Because fall chum salmon migrate to the upper reaches of the Yukon River drainage, they are more robust with higher levels of fat to make the longer migration than the summer chum salmon component, which are distributed mostly downstream of the confluence of the Tanana River drainage. Run timing of fall chum salmon migration allowed for large numbers to be cribbed just before freeze-up in late September to provide winter food supplies to dog teams that were, at one time, numerous in the Upper Yukon Management Area. Subsistence harvests have fluctuated during times when the fishery was reduced or closed by management actions to provide for escapement goals. The use of dog teams declined during this time due to a complex set of socioeconomic issues, including technological advances, such as the introduction of snowmachines, and changes in management that contributed to reductions in fish camp use and the harvest of the amount of fish needed for dog teams (Andersen and Scott 2010; Andersen 1992; Wolfe and Scott 2010; Brown et al. 2015). The 2003–2019 average harvest was 82,000 fall chum salmon. Only 5 out of 16 years (31%) during 2004–2019 were above the lower end of the Amounts Reasonably Necessary for Subsistence Uses (ANS) range of 89,500–167,900 fall chum salmon. Changes in the fisheries have also further reduced the ability to achieve ANS, particularly the harvest that was once intended for subsistence dog teams has shifted to the commercial category by the increase in catcher sellers supplying the market. Commercial harvests of fall chum salmon are allowed on surpluses above that needed for escapement and subsistence priorities and therefore fluctuate more widely, as shown by historical productivity (Figure 2). The average commercial harvest from 2004 to 2019 was 205,000 fall chum salmon. Harvests of fall chum salmon from years all fisheries were open (2010–2019) averaged 354,000 fish (Table 1, Figure 3). Decreases in exploitation rates are pronounced in years of fishery restrictions for fall chum salmon (Figure 4). Most recently, from 2020–2024 annual harvests of fall chum have been below 7,000 fish, with most of those taken incidentally in nonsalmon directed fisheries and assessment project mortalities for sampling purposes. Fish that were taken from assessment projects were distributed to local communities.

Brood Year Return Information

Brood year data are used to assess the productivity of aggregate fall season chum salmon stocks to represent the drainagewide run. Total brood year return divided by the parent-year escapement is a measure of stock productivity and is expressed as recruits or returns per spawner (R/S). Higher R/S values suggest better productivity. The minimum level of replacement for a stock is an R/S of 1; i.e., for each fish that spawns, 1 fish returns to spawn (Table 4, Figure 6). The most recent brood year with all age classes returned (ages 3–6) is 2018, and recruits for incomplete brood years of age-6 for 2019 and age-5 for 2020 are estimated. The ratio of R/S for fall season chum salmon stock for complete brood years has ranged from a low of 0.08 from 2017 to a high of 9.00 from 2001, with an overall average of 1.65 R/S from 1974 to 2018 (Table 4, Figure 6).

The average replacement is 197,000 fall chum salmon based on brood return from Yukon River drainagewide escapements from 1974 to 2020 (Figure 5). Between 1974 and 1993, during the consistent even/odd-year abundance cycles, the average was 353,000 fall chum salmon, with a range of -308,000 to 941,000 fish. Since 1994, replacement has become highly variable, along with run abundances, with a range of -1.6 million to 2.6 million fish. Since 1994, 13 of the 27 (48%) brood year returns through 2020 resulted in not meeting replacement or producing yield. With larger and more variable run sizes, the frequency and depth of negative yields have resulted in substantially less production.

Age class composition of the annual returns is based on chum salmon captured in Lower Yukon River test fisheries and is used to develop the brood tables. Fall chum salmon return to the Yukon River as age-3 through age-6 fish, but age-4 and age-5 salmon dominate the run (Figure 6). During the fall season, age-4 chum salmon contribute on average 69% and dominate most years (1974–2018; except 1992, 2006, and 2009), whereas age-5 fish represent 26% of the return.

There is some indication of density dependence in fall chum salmon, as noted by low abundance years producing above-average to record-high R/S and large runs often resulting in the poorest R/S well below 1:1 (Figure 6). The unique locations these fish spawn in are finite in size and likely cannot support additional spawners without disrupting each other, especially as some areas may be decreasing with climate change. Historically, fall chum salmon have rebounded quickly following years of poor run sizes, due to their inherent potential for high productivity from low escapements. However, Yukon River fall chum salmon have been slower to recover during this most recent decline compared to other chum salmon stocks across the AYK region. Of note is that the return per spawner for fall chum salmon stocks has been increasing annually since 2017 (Figure 2). If the recruit per spawner remains above 1:1, run sizes could increase to levels that support at least some level of subsistence harvest.

ESCAPEMENT GOAL EVALUATION

The Policy for Statewide Salmon Escapement Goals (SSEGP; 5 AAC 39.223), adopted by the board in 2001, established the formal process for setting escapement goals. The SSEGP and the SSFP require the department to report on salmon stock status and escapement goals to the board on a regular basis, document and review existing salmon escapement goals, establish goals for stocks for which escapement can be reliably measured, and prepare scientific analyses with supporting data when goals are created, modified, or recommended for elimination.

Yukon management area escapement goals were first documented by Buklis (1993), as required under ADF&G's original escapement goal policy, and signed in 1992. These early goals were

generally established using a simple escapement averaging methodology based on aerial survey counts. Following the adoption of the new policies (SSFP and EGP), BEGs were established on 6 tributaries along with a drainagewide goal for fall chum salmon within the Yukon River drainage. The affected tributaries included Tanana, Delta, Toklat, Teedriinjik (Chandalar), Sheenjek, and Fishing Branch rivers. Since that time, these goals have either been amended or discontinued through the escapement goal evaluation process that coincides with the regular board cycle for the AYK region. The goals on the Tanana, Toklat, Sheenjek, and have been discontinued due to changes in environmental conditions that made yearly assessment difficult or impossible, discontinuation of assessment projects, or decreased relevance to management. Additionally, the Fishing Branch River assessments are still on going and incorporated into the drainagewide run reconstructions, however, this goal as well as the Yukon River mainstem goal falls under the purview of Yukon River Salmon Agreement.

In 2009, the Yukon River fall chum salmon spawner recruit analysis was updated and included Pilot Station sonar estimates of abundance (Fleishman and Borba 2009). Results of that updated analysis led to a recommendation to retain the existing goal range but reclassify the goal from a BEG to a SEG because the goal range was sustainable but not likely to maximize yield (Volk et al. 2009). Historical passage estimates from Pilot Station sonar were revised (Pfisterer et al. 2017) and the review team was concerned that those data revisions may have implications for existing summer and fall chum salmon goals. The spawner recruit relationship was evaluated for both runs following published methods consistent with those used to establish the current goals (Hamazaki and Conitz 2015; Fleishman and Borba 2009). Input data for both reviews were updated through 2017 and included changes to historical Pilot Station sonar estimates. In general, the spawner-recruit analysis and estimated biological reference points (e.g., Smsy and Seq) were consistent with previous analyses providing no justification to change either of these goals at that time. Current escapement goals associated with Yukon River fall chum salmon are presented in Table 5.

An IMEG has been established for Canadian-origin mainstem Yukon River fall chum salmon and Fishing Branch River fall chum salmon stocks. In 2010, the YRP adopted an IMEG range of 70,000–104,000 Canadian-origin fall chum salmon for the mainstem Yukon River. This range was developed as 0.8–1.2 times the estimated spawners at maximum sustained yield (86,600 fish). In 2008, the YRP adopted an IMEG range of 22,000–49,000 fall chum salmon for the Fishing Branch River. Since the establishment of the IMEGs, there has been no new analyses to inform a change to either goal range. As such, the YRP has approved multiple JTC recommendations to extend the IMEGs for 3-year periods. The first 3-year recommendation for Fishing Branch River began in 2008 and the mainstem stock in 2010. In spring of 2023, the YRP extended the Canadian-origin Mainstem Yukon River and Fishing Branch River fall chum salmon IMEGs for an additional 3-year period, 2023–2025. The JTC has begun a comprehensive fall chum salmon stock status and escapement goal review of Canadian-origin mainstem and fall chum salmon stocks (JTC 2025).

STOCK OF CONCERN RECOMMENDATION

Beginning in the late 1990s, Yukon River fall chum salmon experienced a period of low returns resulting in a stock of yield concern designation in 2000. An action plan and associated regulatory changes were adopted over the next 2 board cycles. Returns improved into the mid-2000s, and the stock of concern designation was discontinued during the 2006 board cycle.

After over 10 years of relatively good Yukon River fall chum salmon returns, production diminished unexpectedly in 2020 resulting in record low run abundance. To conserve fall chum salmon, the department has taken management actions over the last 5 years to achieve the largest possible escapements given extremely poor run sizes of fall chum salmon. These actions have resulted in record low harvests levels. Annual harvests have been below 7,000 fall chum salmon since 2020 (Table 1), compared to the 2010–2019 historical range of 74,000–578,000 fish. Despite such small harvests, the Yukon River drainagewide escapement goal of 300,000–600,000 fall chum salmon was not achieved in any year from 2020–2024 (Table 2). If harvest had been reduced to zero during this timeframe, the drainagewide escapement goal would still not have been achieved. As a result, ADF&G recommended classifying Yukon River fall chum salmon as a stock of management concern, which was adopted by the board at the October 2025 work session.

FACTORS AFFECTING YUKON FALL CHUM SALMON STOCKS

Salmon spawning, rearing, and migration habitat throughout much of the Alaskan and Canadian portions of the Yukon River drainage remain largely undisturbed; however, some habitat factors are present that may adversely affect salmon production. Although the effects of these factors are not well understood, the potential individual and cumulative effects of these habitat factors should be considered when assessing the future stock productivity. A detailed discussion of these habitat issues in Alaska is found in the public draft of the *Yukon River Comprehensive Salmon Plan for Alaska*³ and Holder and Senecal-Albrecht (1998). This plan discusses mining, logging, potential pollution and habitat changes related to urban development, rural sanitation, increased road traffic along a few tributaries, and agriculture. Although logging and mining may occur in the Yukon Territory of Canada, where a large proportion of Yukon River king and fall chum salmon spawn, these processes are monitored by the Canadian government and are not discussed in detail here.

With few notable exceptions, the Yukon River watershed is free-flowing. The Chena River Lake (Tanana River drainage) Flood Control Project is the only dam in the Alaska portion of the drainage. The structure was built by the U.S. Army Corps of Engineers from 1973 to 1979 to control flood waters in downtown Fairbanks in response to the devastating 1967 flood. Some resource users have raised concerns about the dam’s effects on the emigration of salmon fry or the migration of adults. During high water events, the dam’s gates are lowered to divert some of the Chena River’s flow to a vegetated floodway immediately upstream of the dam until the flow recedes to manageable levels. This diverted water may later flow into the Tanana River or drain back into the Chena River. As fall chum salmon typically do not spawn in the Chena River this is more of an impediment to summer chum and king salmon. The potential effects on outgoing fall chum juveniles from stranding, avian predation, and disruption of imprinting are unknown.

Climate change is associated with rising water temperatures in both fresh water and marine environments, with implications for salmon survival. At a global scale, the 10 warmest years are also the most recent years (2015—2024) according to the World Meteorological Organization

³ Yukon River Comprehensive Salmon Plan for Alaska, under public review. <https://www.adfg.alaska.gov/index.cfm?adfg=fishingHatcheriesPlanning.enhance> (cited September 19, 2025).

(1850–2024; World Meteorological Organization 2025).⁴ Relatively warmer air temperatures have been linked to elevated water temperatures, variable snow/ice cover, permafrost melt, and glacial retreat, each of which has implications for Yukon River salmon habitats, growth, and survival. A review of Yukon River water temperature data indicated water temperatures greater than 17°C were common and prolonged during the season. Those high temperatures are known to increase stress on migrating salmon. Both the Bering Sea and Gulf of Alaska marine ecosystems have experienced unusually warm conditions over the past decade. The eastern Bering Sea has been in a warm phase since 2014 and has experienced heat waves between 2016 and 2019 (Siddon 2021). The Gulf of Alaska experienced heat waves between 2014 and 2016 and again in 2019 (Ferris and Zador 2021). Higher ocean temperatures increase metabolic demands, which require salmon to consume more food to meet their energetic needs. Additionally, changing temperature regimes are associated with changes in the abundance, quality, and distribution of salmon prey (Siddon 2021). The loss of food quality may result in salmon returning with less reserves to ascend the Yukon River. Temperatures in both the Bering Sea and Gulf of Alaska have returned to more average conditions in recent years; however, a lagged effect of prior-year warm conditions on recent years' salmon returns are possible.

It is estimated that at least 50% of all water bodies in the Yukon watershed have not been evaluated for the distribution of anadromous species, and a similar or higher percentage of first and second-order tributaries have not been surveyed. Without documentation based on field work, these streams are not afforded legal protection under Alaska Statute 16.05.841 (Fishway Act) or AS 16.05.871 (Anadromous Fish Act). A significant number of streams could be added/corrected in the Anadromous Waters Catalog. Regular annual review of the catalog is conducted, and nominations are submitted to document the presence of anadromous fish.

Fall chum salmon generally have a shorter incubation period compared to summer chum, because they spawn in late October but still hatch in April, similar to the emergence of other salmon species. Because fall chum salmon spawning areas are concentrated in upwelling waters that are relatively warmer and have a more consistent temperature regime throughout the wintertime period, sufficient degree days are accrued. Habitat issues, such as geological changes in aquifers of upwelling waters, could have a drastic effect on the suitability for spawning beds. Severe cold winters with low levels of insulating snow could reduce the available habitat if freezing occurred deep enough or caused areas to become dewatered. Juvenile chum salmon travel to the ocean with the spring runoff that first year of emergence and face predation for the rest of their lives. ADF&G monitors select fall chum salmon spawning ground overwintering temperatures in the Delta and Toklat rivers. Research is ongoing in the Canadian portion of the drainage concerning the shift of the Kaskawulsh Glacier in 2016. Previously, the glacier supplied Kluane Lake with a significant annual summer influx of glacial melt water, but now it primarily drains into southeast Alaska. Kluane Lake is now primarily supported by upwelling water and summer rain runoff, and the water levels in the lake have greatly diminished. There is concern whether there will be enough water to support the fall chum salmon populations in the drainage. To date, known fall chum spawning areas within the Kluane Lake drainage have been dewatered by this loss of glacial melt water.

⁴ World Meteorological Organization. 2025. WMO confirms 2024 as warmest year on record at about 1.55°C above pre-industrial level. WMO Press Release. <https://wmo.int/news/media-centre/wmo-confirms-2024-warmest-year-record-about-155degc-above-pre-industrial-level> (accessed October 20, 2025).

Lack of food in the ocean could also explain the slow recovery of chum salmon to the Yukon River compared to other areas of Alaska. Yukon River fall chum salmon have the longest spawning migration compared to all other chum salmon in the world. This feat requires a large amount of fuel reserves to ascend to the headwaters of the Yukon River. The 2021 fall chum salmon run set a record-low length at age for all age classes. Since 2021, the primary parent year of age-4 fish has steadily been increasing in size.

FISHERY MANAGEMENT OVERVIEW AND BACKGROUND

Overview

Management of the Yukon Area fall chum salmon subsistence, personal use, and commercial salmon fisheries follows the *Yukon River Drainage Fall Chum Salmon Management Plan* (5 ACC 01.249). The plan sets the current threshold number of fall chum salmon needed to prosecute a subsistence fishery at 300,000 fish, personal use and sport fishery at 500,000 fish, and a commercial fishery at 550,000 fish, unless an individual escapement goal or priority use needs are met for a specific district or subdistrict. The management plan incorporates the amount of fall chum salmon needed to meet U.S./Canada treaty objectives and provides guidelines necessary for escapement and prioritized uses with considerations for Canadian harvest shares. The plan aligns management objectives with the established escapement goals, provides flexibility in managing subsistence harvests when stocks are low, and bolsters salmon escapement as run abundance increases. Additional guidance for fall chum and overlapping coho salmon fisheries management includes the *Yukon River fall chum salmon guideline harvest ranges* (5 AAC 05.365) and the *Tanana River Salmon Management Plan* (5 AAC 05.367).

Fall season fishery management decisions are based on the forecast, preseason projection, inseason projection, and available fisheries information of fall chum salmon. Initial management of the fall season is determined by the preseason projection for fall chum salmon in mid-July. The preseason projection is based on the historical relationship between the summer chum and fall chum salmon run sizes. Fall chum salmon, on average, represent approximately 30% of the total chum salmon run in the Yukon River. Fall chum salmon management transitions to using inseason projections from assessment projects and genetic data (referred to as MSA) in early August.

Because the coho salmon run is smaller than the fall chum salmon run, and timing is later, coho salmon are secondarily harvested during the fall season fisheries. Subsistence, sport, and personal use fisheries also harvest coho salmon while targeting fall chum salmon. Coho salmon are primarily harvested incidentally during the fall chum salmon-directed commercial fishery. The *Yukon River Coho Salmon Management Plan* (5 ACC 05.369) allows a coho salmon-directed commercial fishery in the absence of achieving the threshold number of fall chum salmon if a harvestable surplus of coho salmon exists and if a commercial fishery will not have a significant effect on fall chum salmon escapement and allocation. In order to implement a coho-directed commercial fishery, there must be a run size of at least 500,000 fall chum salmon.

Past Board of Fisheries Actions for Fall Chum Salmon

In 1994, the *Yukon River Drainage Fall Chum Salmon Management Plan* (5 ACC 01.249) was adopted, which established fall chum salmon run size thresholds. These thresholds provided guidelines to the department on how to manage the subsistence, commercial and sport, and personal use fisheries within the drainage to achieve escapement and harvest needs. The fall chum salmon runs began to decline in the late 1990s and by 2000 had not rebounded and the board

adopted the department's recommendations to classify Yukon River fall chum salmon as a stock of yield concern along with designating the Toklat and Fishing Branch rivers fall chum salmon as stocks of management concern. Action plans were developed as a response, and further refinements were made to the fall chum salmon management plan. The run size thresholds were later amended in 2004 to better align with the established escapement goal and to allow for limited subsistence fishing when runs were poor. Along with this change, elements of the Toklat River fall chum salmon rebuilding plan were incorporated in the drainagewide plan to better align regulations with current management practices. By 2007, the fall chum salmon stocks had rebounded, and the stock of concern designation was discontinued.

In addition to the modifications made to the management plan, additional gear types and gear specifications have been adopted to provide more tools for the department to conservatively manage the fisheries when needed. For gillnets, the board has adopted regulations that allow the department to restrict gillnet mesh size, length, and limit operation as only a set net. Dip nets were added as a legal gear type in both subsistence and commercial fisheries, to facilitate the live release of any salmon species to which there is a conservation concern. The department has also been provided with the same ability to require the release of a specific salmon species from fish wheels, beach seines, and hook and line gear during times of conservation. These additional regulations have been used extensively in the past 5 years to allow subsistence fishing opportunities on more abundant salmon and nonsalmon species, while conserving those species (king and fall chum salmon) that have experienced historically low returns.

Fall Season Management Review (2020–2025)

Following average fall chum and coho salmon runs in 2018 and 2019, sharp declines in salmon returns were experienced from 2020 to 2024. Due to the poor salmon runs during these years, fall chum salmon closures occurred for all fisheries. The minimum drainagewide escapement goal for fall chum salmon was not achieved in the recent 5 years; however, tributary escapement goals have been met sporadically. In 2020 and 2024, only the Delta River, in the Tanana River drainage, achieved its fall chum salmon escapement goal. In 2021 and 2022, none of the 4 tributary goals for fall chum salmon were achieved, but in 2023, U.S. tributary escapement goals were met in the Teedriinjik (Chandalar River) and the Delta River, showing slight improvement (Table 2). Fall chum and coho salmon subsistence harvest have been below the ANS (89,500–167,900 fall chum and 20,500–51,980 coho salmon) due to a lower harvest level by users and a change of harvest patterns from subsistence users purchasing salmon from catcher–sellers in 2018 and 2019, and extreme fall season salmon fishing closures during 2020–2024.

In 2020, subsistence salmon fisheries in the lower Yukon River began the season on the regulatory fishing schedules, but the Yukon Management Area closed to subsistence and personal use salmon fishing when inseason projections fell below 300,000 fall chum salmon. Based on poor preseason projections and inseason projections developed from assessment projects, directed fall chum salmon subsistence fishing has been largely closed throughout the drainage since 2020, and the use of gillnets has been limited to 4-inch or smaller mesh size, for targeting nonsalmon. The only directed fall chum salmon subsistence fishing opportunity during this time occurred in 2023, when limited fall chum salmon opportunity opened in the Teedriinjik River drainage on September 15 with 6-inch or smaller mesh set gillnets, fish wheels, dip nets, hook and line, and beach seines, because the lower end of the SEG (85,000–234,000) was projected to be met in that system. In 2024, the use of 4-inch or smaller mesh gillnets was reduced from 12:01 AM on Fridays to 11:59 PM on Sundays, drainagewide, starting on August 26, due to much lower returns of both fall chum

and coho salmon than expected, and concerns for potential interception of both salmon species in gillnets targeting nonsalmon species for the remainder of the season. Limited coho salmon retention in subsistence fisheries was allowed with selective gears in 2020, 2022, 2023, and 2024, based on inseason run projections. Harvests of both salmon species were very low during this time. The 2020–2024 average of 3,718 fall chum salmon harvested in test fishing projects and subsistence fisheries is a marked decline when compared to the 2010–2019 average of 85,090 fall chum salmon (Tables 1).

Recently, summer chum salmon runs have been significantly later than average, and there has been a higher proportion entering the Yukon River at the beginning of the fall season in each of the last 5 seasons. This late abundance has allowed the department to provide limited subsistence salmon fishing opportunities on a harvestable surplus of summer chum salmon between the end of the closed king salmon run and the beginning of the fall chum salmon run. In 2023 and 2024, subsistence fishing for chum salmon with selective gears was open for the first 10 days of the fall season (July 16–July 25) because the preseason projection exceeded 300,000 fall chum salmon, and a harvestable surplus of summer chum salmon made up the majority of chum salmon in the river during this time (confirmed by MSA). Amid almost total closures of directed subsistence salmon fishing since 2020, ADF&G will continue to look for potential opportunities to provide as many subsistence salmon fishing opportunities as possible.

In 2025, the forecast was for 218,000 (range: 114,000–322,000) fall chum salmon (JTC 2025). Because of the poor projected run sizes and record-low primary parent-year escapements for both fall chum and coho salmon, cautious management approaches were implemented. Subsistence fishing for fall chum and coho salmon was closed at the beginning of the fall season in each district, based on historic fall chum salmon run timing. Additionally, the use of 4-inch or smaller mesh set gillnets and manned fish wheels to target nonsalmon was only open from noon on Thursdays until noon on Sundays to avoid intercepting king, chum, and coho salmon. MSA and ASL information indicated improvements in both the fall chum and coho salmon runs. A harvestable surplus of coho salmon was identified, and retention of coho salmon was allowed drainagewide starting August 21 using all currently legal gear types. Final assessment project data and harvest information were not available at the time of publication of this document. A season summary was published with preliminary information.

ACTION PLAN MANAGEMENT OPTIONS FOR ADDRESSING STOCK OF CONCERN

Action Plan Goals

This action plan is intended to facilitate rebuilding the fall chum salmon run in the Yukon River drainage. Since 2020, Yukon River fall chum salmon have declined to unprecedented levels of low production and run size with little if any yield available for Yukon River fall chum salmon fisheries. This has occurred in concert with similar unprecedented declines on other Yukon River salmon populations. The impact of these combined declines on Yukon River subsistence, commercial, personal use, and sport fisheries has been disastrous. There are a range of factors impacting Yukon River fall chum salmon production, most of which are beyond our ability to affect or control. In general, the goals of this action plan are to maximize fall chum salmon escapements during a time of unprecedented low productivity and run size while minimizing the impact on what little subsistence harvest opportunity is currently possible in the Yukon Area. The many regulatory changes the board has implemented over past cycles have already provided

Yukon Area managers with a variety of conservation-oriented options and tools used to achieve these general goals. There is not much more that can be done until such time as the range of factors impacting production improves and fall chum salmon yield rebuilds to historical levels. The following options are intended to build upon past actions and set the stage for any further amendments or actions the board may want to consider.

Option #1–Subsistence, Commercial, and Sport Fisheries

Status Quo

Objective: Continue management of Yukon River fall chum salmon with regulations currently specified in *Fishing seasons and periods* (5 AAC 01.210), *Lawful gear and gear specifications* (5 AAC 01.220), *Yukon River Drainage Fall Chum Salmon Management Plan* (5 ACC 01.249), *Yukon River fall chum salmon guideline harvest ranges* (5 AAC 05.365), and *Tanana River Salmon Management Plan* (5 AAC 05.367).

These regulations and management plans have been developed and refined over the past 2 decades. The commissioner may take additional actions by EO authority to limit time and area based on preseason and inseason indicators of abundance. During the recent period of historically low abundances, directed fall chum salmon fishing in the subsistence fishery has been completely closed since mid-way through the 2020 fall season. There has not been a directed fall chum salmon commercial fishery since 2019, and the sport fishery has been closed. Despite the full closures in all fisheries, the drainagewide goal has not been achieved since 2019. This points toward a decline in overall production in this stock.

Benefits: Allows the department to flexibly manage this stock based on preseason and inseason indicators of abundance.

Detriments: Continued closures and substantial restrictions within the subsistence gillnet fishery to protect fall chum salmon, which could see foregone harvest opportunity coho salmon and nonsalmon species.

Option #2–Subsistence Fishery

Fish wheel Specifications

Objective: Adopt gear operation and construction specifications for subsistence fish wheels that are considered more fish-friendly, similar to those found in 5 AAC 05.362(j)(1).

Currently there are no defined specifications for the construction of a fish wheel used in the Yukon River subsistence fishery. This allows stakeholders to build their fish wheels with any combination of materials. Fish wheels baskets are commonly made of wood and chicken wire is used for the mesh. The use of wire and other ridged materials are not considered fish-friendly. Over time, fish wheels have been more often used as a conservation tool to allow for fishing opportunities on abundant species while allowing for the release of a species of concern, with the fish wheel being equipped with a live box or chute and being closely attended while in operation. However in the commercial fishery of Subdistrict 4-A and District 6, fishermen have been using specially constructed, fish-friendly fish wheels with basket sides and bottoms consisting of soft mesh material similar to that of seine web, and with a slide or chute with a smooth bottom, and with closed cell foam-lined sides which return salmon immediately back to the water. These

construction specifications are intended to reduce the potential for injuring fall chum salmon that are being released back to the water alive when targeting more abundant fish species.

Benefits: The department has refrained from allowing the operation of subsistence fish wheels at certain times because of the historically low run sizes of Yukon River fall chum salmon being experienced since 2019. This is because of a concern of them potentially harming the fish that will ultimately be needed to be released, such as removal of their slime layer and scales, along with getting beat up as they thrash around in the basket after removal from the water. By adopting new requirements to construct fish wheels in a fish friendly manner, the department may be more inclined to allow additional opportunity when there is surplus coho salmon while requiring the live release of fall chum salmon.

Detriments: This would result in a direct cost to stakeholders who need to modify existing gear to meet the specifications of a fish-friendly fish wheel. Also having to be present on the fish wheel while under operation could be a hardship for some subsistence users.

CONDITIONS FOR DELISTING A STOCK OF CONCERN

1. If the lower bound of the established drainagewide SEG range is met or exceeded in 5 consecutive years and is expected to meet the goal range in future years the department may recommend removing the stock as a stock of “management concern” at the first Arctic/Yukon/Kuskokwim board meeting after this condition is met.
2. Should the department determine a harvestable surplus in excess of 300,000 fall chum salmon exists, limited subsistence opportunity in the Yukon River mainstem may be provided.
3. Subsistence fishery management measures could be relaxed in specific Alaskan tributaries if updated stock composition and run assessment data indicates areas where specific restrictions are no longer needed to ensure the established escapement goals will be met.

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TABLES AND FIGURES

Table 1.– U.S. (Alaska) harvest of Yukon River fall chum salmon, 2000–2024.

Year	Subsistence ^a	Commercial ^b	Commercial related ^c	Personal use	Test fish sales ^d	Yukon Area total
2000	19,395			1	0	19,396
2001	35,703			10	0	35,713
2002	19,674			3	0	19,677
2003	56,930	10,996	0	394	0	68,320
2004	62,526	4,110	0	230	0	66,866
2005	91,534	180,249	0	133	87	272,003
2006	84,002	174,542	0	333	0	258,877
2007	101,221	90,677	0	173	0	192,071
2008	89,357	119,265	0	181	0	208,803
2009	66,119	25,876	0	78	0	92,073
2010	68,645	2,550	0	3,209	0	74,404
2011	80,202	238,979	0	347	0	319,528
2012	99,309	289,692	0	410	166	389,577
2013	113,384	238,051	0	383	121	351,939
2014	92,529	115,599	0	278	30	208,436
2015	86,600	191,470	0	80	50	278,200
2016	84,617	465,511	0	283	668	551,079
2017	86,139	489,702	0	626	1,246	577,713
2018	69,207	387,788	0	505	907	458,407
2019	63,734	268,360	0	408	275	332,777
2020	5,728			37	0	5,765
2021	705			0	0	705
2022	2,794			0	0	2,794
2023	6,037			0	0	6,037
2024	3,327			0	0	3,327
5 yr. Avg. (2020–2024)	3,964			7	0	3,971

^a Includes test fish harvest and commercial retained fish (not sold) that were utilized for subsistence. Coastal District harvest is included. Beginning 2017 includes harvest from the Coastal District communities of Scammon Bay and Hooper Bay even though not all stocks are bound for the Yukon River.

^b Includes fish sold in the round and estimated numbers of female salmon commercially harvested for production of salmon roe. Beginning in 1999 commercial harvest may include some commercial related harvest.

^c Includes an estimate of number of salmon harvested for the commercial production of salmon roe and the carcasses used for subsistence. In prior reports subsistence plus commercial related harvests are noted as subsistence "use".

^d Test fish sales is the number of salmon sold by ADF&G test fisheries.

^e Commercial fishery was not conducted.

Table 2.— Fall chum salmon passage estimates or escapement estimates for selected spawning areas in the Yukon River drainage, 2000–2024.

Year	Alaska						Canada			
	Yukon River drainagewide escapement estimate ^a	Tanana River drainage			Upper Tanana River abundance estimate ^e	Teedriinjik River ^f	Porcupine drainage		Canada mainstem	
		Toklat River ^b	Kantishna River abundance estimate ^c	Delta River ^d			Sheenjek River ^g	Fishing Branch River ^h	Border passage estimate ⁱ	Spawning escapement estimate
2004	576,800	35,480	76,163	25,073	123,879	169,848	41,600 ^j	20,417	163,625 ^k	154,080
2005	1,906,000	17,779 ^l	107,719	28,132	337,755	526,838	485,886	119,058	451,477	437,498
2006	945,000	–	71,135	14,055	202,669	254,778	175,620	30,954	227,515	220,898
2007	956,500	–	81,843	18,610	320,811	243,805	69,184	32,150	246,317	236,987
2008	639,900	–	–	23,055	–	178,278	50,348	19,086 ^l	174,028	167,898
2009	507,900	–	–	13,492	–	–	54,126	25,828	94,739	93,626
2010	507,400	–	–	17,993	–	167,532	24,669 ^j	15,413	121,498	117,789
2011	919,300	–	–	23,639	–	298,223	97,976	13,085 ^l	211,878	205,566
2012	691,400	–	–	9,377	–	205,791	104,701	22,399	141,567	137,662
2013	854,600	9,161	–	31,955	–	252,710	–	^m	204,149	200,262
2014	739,400	–	–	32,480	–	221,421	–	^m	159,846	156,796
2015	542,350	8,422	–	33,401	–	164,486	–	8,351	112,555	108,658
2016	833,700	16,885	–	21,913	–	295,023	–	29,397	148,012	145,267
2017	1,723,000	–	–	48,783	–	509,115	–	48,524	404,989	401,585
2018	653,200	25,587	–	39,641	–	170,356	–	10,151	157,083	154,126
2019	521,250	–	–	51,748	–	116,323	–	18,171	102,625	99,866
2020	183,200	–	–	9,854	–	–	–	4,795	23,512	23,512
2021	93,285	–	–	1,613	–	21,162	–	2,413	23,170	23,170
2022	170,800	7,360	–	5,670	–	67,434	13,956	2,934	22,034	22,034
2023	287,900	–	–	13,366	–	141,120	15,958	11,528	22,090	22,090
2024	161,100	1,779	–	16,880	–	58,457	14,320	5,933	16,174	16,174
Escapement objective ⁿ	300,000–600,000	15,000–33,000 ^o		7,000–20,000	46,000–103,000 ^o	85,000–234,000	50,000–104,000 ^o	50,000–120,000 22,000–49,000 ^p		>80,000 70,000–104,000 ^q
Averages										
2010–2019	798,560	15,014	NA	31,093	NA	240,098	75,782	20,686	176,420	172,758
2020–2024	179,257	4,570	NA	9,477	NA	72,043	NA	5,521	21,396	21,396

-continued-

Table 2.– Page 2 of 2.

Note: Yukon River mainstem sonar historical estimates were revised in 2016 using selectivity parameters. En dashes indicate no data. NA indicates insufficient data to generate an average.

- ^a Escapement estimates are derived from a Bayesian state-space model as posterior medians.
- ^b Expanded total abundance estimates for upper Toklat River index area using stream life curve developed with 1987–1993 data. Index area includes Geiger Creek, Sushana River, and mainstem floodplain sloughs from approximately 0.25 mile upstream of the roadhouse, unless otherwise indicated.
- ^c Fall chum salmon abundance estimate for the Kantishna River drainage is based on a mark–recapture program operated during 1999–2007.
- ^d The population estimate is typically generated from replicate foot surveys and stream life data (area under the curve method).
- ^e Fall chum salmon abundance estimate for the upper Tanana River drainage is based on a mark–recapture program operated during 1995–2007. Upper Tanana River consists of that portion upstream of the confluences with the Kantishna River.
- ^f Split-beam sonar estimates from 2002 to 2006, DIDSON (dual-frequency identification sonar) since 2007. The project was aborted or did not operate in 2009 and 2020. Sonar counts were expanded to represent the remainder of the run after the project was terminated for the season.
- ^g Split-beam sonar estimates from 2002 to 2004 and DIDSON from 2005 to 2012 and 2022. Sonar counts were expanded to represent the remainder of the run after the project was terminated for the season.
- ^h Weir counts with expansions through October 25, unless otherwise indicated.
- ⁱ Border passage estimate is based on mark–recapture from 1980 to 2005 and 2006 to present is based on sonar minus harvest from Eagle residents upstream of deployment.
- ^j Sonar counts only used 1 bank (right).
- ^k Border passage estimates for 1999 to 2004 were revised using a stratified population analysis system (Arnason et al. 1995).
- ^l The count is probably low due to issues with apportionment, the length of weir operations, the time of survey, or water level.
- ^m Fishing Branch River weir did not operate; estimates based on radiotelemetry resulted in Canada estimates of 25,376 and 7,304 for 2013 and 2014, respectively; and values are in calculable.
- ⁿ Escapement objectives include current drainagewide sustainable escapement goals (SEG) and historical discontinued tributary project biological escapement goals (BEG). Also included are U.S./Canada Yukon River treaty goals along with the current interim management escapement goals (IMEG).
- ^o Escapement goals discontinued in 2010 for Toklat River, 2016 for Sheenjek River, and 2019 for Tanana River (upper Tanana plus Toklat).
- ^p Interim management escapement goal (IMEG) established for 2008–2010 based on the percentile method and carried forward.
- ^q Interim management escapement goal (IMEG) established for 2010 based on brood table of Canadian-origin mainstem stocks (1982–2003).

Table 3.–Pilot Station sonar project estimates with 90% confidence interval (CI), 2004–2024.

Year ^a	Chinook	CI (+/-)	Summer chum ^b	CI (+/-)	Fall chum ^b	CI (+/-)	Coho ^c	CI (+/-)	Pink	CI (+/-)
2004	200,761	12,145	1,344,213	30,363	633,368	36,529	207,844	19,630	399,339	20,531
2005 ^d	259,014	42,452	2,570,697	78,867	1,893,688	110,806	194,372	29,319	61,091	11,294
2006	228,763	27,696	3,780,760	155,452	964,238	45,647	163,889	18,167	183,006	23,648
2007	170,246	25,535	1,875,491	74,394	740,195	46,349	192,406	19,259	126,282	22,462
2008	175,046	21,367	1,849,553	68,542	636,525	30,023	145,378	13,885	580,127	86,243
2009 ^e	177,796	26,130	1,477,186	69,895	274,227	38,552	240,779	29,211	34,529	12,597
2010	137,899	61,122	1,423,372	89,356	458,103	40,797	177,724	12,489	919,036	639,693
2011	148,797	20,174	2,051,501	77,486	873,877	42,660	149,533	20,770	9,754	2,983
2012	127,555	18,652	2,136,476	79,036	778,158	62,184	130,734	15,795	420,344	59,823
2013	136,805	32,901	2,849,683	114,602	865,295	72,277	110,515	23,297	6,126	6,495
2014	163,895	18,735	2,020,309	98,909	706,630	61,902	283,421	28,112	679,126	59,992
2015	146,859	30,958	1,591,505	98,413	669,483	40,757	121,193	14,614	39,690	12,436
2016	176,898	18,467	1,921,748	80,516	994,760	64,435	168,297	18,403	1,364,849	87,144
2017	263,014	29,110	3,093,735	138,259	1,829,931	89,124	166,320	33,528	166,529	31,240
2018	161,831	24,538	1,612,688	107,348	928,664	55,042	136,347	11,895	689,607	47,967
2019	219,624	20,477	1,402,925	85,902	842,041	37,151	86,401	9,529	42,353	8,893
2020	162,252	18,967	692,602	36,325	262,439	17,810	107,680	6,843	207,942	18,745
2021	124,845	10,831	153,718	16,149	146,197	11,680	37,255	3,881	22,181	5,832
2022	48,439	7,379	463,806	24,817	325,717	19,197	92,102	7,500	158,767	21,735
2023	58,529	14,338	845,988	35,973	370,015	21,643	46,697	7,610	9,735	3,557
2024	64,198	14,093	758,260	39,248	246,665	14,672	77,665	7,268	127,372	20,102
Averages										
2010–2019	168,318		2,010,394		894,694		153,049		433,741	
2020–2024	91,653		582,875		270,207		72,280		105,199	

Note: These values are not escapement or run size estimates.

^a Estimates for all years were generated with the most current apportionment model.

^b Reported chum salmon numbers are before July 19 (summer) and after July 18 (fall). These values do not remove genetically fall fish in summer or summer fish in fall season.

^c Estimate may not include the entire run. From 2008 to present, operations were extended to September 7, instead of the usual end date of August 31.

^d Estimates include extrapolations from June 10 to June 18 to account for the time before the DIDSON (dual-frequency identification sonar) was deployed.

^e In 2009, high water levels occurred during the summer season, followed by extremely low water during the fall season; therefore, passage estimates are considered speculative.

^g Number of fish additional to the lower end of the *Yukon River Salmon Agreement* (a negative number is the number of fish below the required value)

Table 4.– Yukon River fall chum salmon estimated brood year production and return per spawner estimates, 1974–2024.

Year	(S) Estimated annual totals		Estimated brood year return								(R)	(R/S)	
	Escapement ^b	Catch	Run	Number of salmon ^a				Proportion				Total brood year return	Return/spawner
				Age 3	Age 4	Age 5	Age 6	Age 3	Age 4	Age 5	Age 6		
1974	681,050	478,875	1,159,925	112,570	648,505	100,042	0	0.13	0.75	0.12	0.00	861,117	1.26
1975	2,355,500	473,062	2,828,562	196,016	1,784,695	67,076	0	0.10	0.87	0.03	0.00	2,047,787	0.87
1976	546,900	339,043	885,943	148,640	641,780	137,901	4,834	0.16	0.69	0.15	0.01	933,155	1.71
1977	733,300	447,918	1,181,218	112,149	1,076,369	193,980	6,372	0.08	0.77	0.14	0.00	1,388,871	1.89
1978	549,000	434,030	983,030	22,187	370,821	107,222	0	0.04	0.74	0.21	0.00	500,230	0.91
1979	1,418,000	615,377	2,033,377	44,539	909,542	307,984	4,294	0.04	0.72	0.24	0.00	1,266,359	0.89
1980	332,700	488,305	821,005	13,680	407,555	203,033	2,867	0.02	0.65	0.32	0.00	627,134	1.88
1981	559,200	677,257	1,236,457	51,333	1,011,244	341,375	9,079	0.04	0.72	0.24	0.01	1,413,031	2.53
1982	241,000	373,175	614,175	12,611	498,283	175,951	780	0.02	0.72	0.26	0.00	687,624	2.85
1983	511,800	525,016	1,036,816	15,304	950,624	232,604	4,047	0.01	0.79	0.19	0.00	1,202,579	2.35
1984	354,550	412,322	766,872	6,688	425,946	163,044	9,148	0.01	0.70	0.27	0.02	604,826	1.71
1985	715,700	515,481	1,231,181	47,445	919,574	305,678	2,625	0.04	0.72	0.24	0.00	1,275,322	1.78
1986	539,800	318,028	857,828	1,457	524,515	343,215	5,668	0.00	0.60	0.39	0.01	874,855	1.62
1987	736,200	406,143	1,142,343	12,173	682,570	345,267	7,720	0.01	0.65	0.33	0.01	1,047,730	1.42
1988	347,600	359,174	706,774	12,236	211,051	161,502	33,889	0.03	0.50	0.39	0.08	418,677	1.20
1989	542,800	545,322	1,088,122	3,266	302,832	417,960 ^c	20,975	0.00	0.41	0.56	0.03	745,033	1.37
1990	499,250	352,264	851,514	682	677,773 ^c	457,289	33,255	0.00	0.58	0.39	0.03	1,168,999	2.34
1991	601,550	439,096	1,040,646	0 ^c	1,131,407	397,974	12,990	0.00	0.73	0.26	0.01	1,542,371	2.56
1992	416,200	149,052	565,252	7,863	698,906	207,097	4,099	0.01	0.76	0.23	0.00	917,965	2.21
1993	381,600	91,135	472,735	9,879	481,053	107,301	3,249	0.02	0.80	0.18	0.01	601,482	1.58
1994	960,050	169,572	1,129,622	4,539	235,976	148,768	2,495	0.01	0.60	0.38	0.01	391,778	0.41
1995	1,156,000	461,534	1,617,534	2,481	265,795	72,367 ^c	418	0.01	0.78	0.21	0.00	341,061	0.30
1996	878,700	261,315	1,140,015	419	172,184 ^c	129,471	8,330	0.00	0.55	0.42	0.03	310,404	0.35
1997	535,600	170,079	705,679	2,495 ^c	242,658	118,916	3,634	0.01	0.66	0.32	0.01	367,704	0.69
1998	279,000	70,857	349,857	438	269,614	59,839	6,310	0.00	0.80	0.18	0.02	336,202	1.21
1999	286,850	131,380	418,230	29,109	719,998	195,715	17,302	0.03	0.75	0.20	0.02	962,124	3.35
2000	220,900	28,642	249,542	9,054	320,339	115,032	0	0.02	0.72	0.26	0.00	444,425	2.01
2001	327,400	45,585	372,985	131,052	2,064,154	721,548	34,820	0.04	0.70	0.24	0.01	2,951,574	9.02

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Table 4.– Page 2 of 3.

Year	(S) Estimated annual totals		Estimated brood year return								(R)	(R/S)	
			Number of salmon ^a				Proportion				Total	Return/	
	Escapement ^b	Catch	Run	Age 3	Age 4	Age 5	Age 6	Age 3	Age 4	Age 5	Age 6	brood year return	spawner
2002	398,200	27,769	425,969	0	466,428	250,780	15,236	0.00	0.64	0.34	0.02	732,444	1.84
2003	713,300	79,225	792,525	27,697	876,801	477,936	18,106	0.02	0.63	0.34	0.01	1,400,540	1.96
2004	576,800	76,616	653,416	0	362,659	156,268	2,527	0.00	0.70	0.30	0.00	521,453	0.90
2005	1,906,000	290,488	2,196,488	2,438	400,612	92,399	3,921	0.00	0.80	0.19	0.01	499,370	0.26
2006	945,000	270,673	1,215,673	26,998	397,427	362,136	30,595	0.03	0.49	0.44	0.04	817,156	0.86
2007	956,500	205,901	1,162,401	95,238	868,440	189,003 ^d	9,071	0.08	0.75	0.16	0.01	1,161,752	1.21
2008	639,900	218,369	858,269	12,495	856,432 ^d	414,830	9,458	0.01	0.66	0.32	0.01	1,293,214	2.02
2009	507,900	94,084	601,984	11,971 ^d	786,500	425,164	22,653	0.01	0.63	0.34	0.02	1,246,288	2.45
2010	507,400	80,191	587,591	2,297	495,341	246,080	9,176	0.00	0.66	0.33	0.01	752,893	1.48
2011	919,300	327,691	1,246,991	22,906	487,098	182,161	1,789	0.03	0.70	0.26	0.00	693,954	0.75
2012	691,400	396,600	1,088,000	69,172	1,170,062	330,977	5,662	0.04	0.74	0.21	0.00	1,575,874	2.28
2013	854,600	358,098	1,212,698	29,130	1,916,126	319,718	3,204	0.01	0.84	0.14	0.00	2,268,178	2.65
2014	739,400	213,469	952,869	57,537	761,246	125,540	2,548	0.06	0.80	0.13	0.00	946,871	1.28
2015	542,350	282,653	825,003	29,812	658,065	88,931	424	0.04	0.85	0.11	0.00	777,232	1.43
2016	833,700	556,829	1,390,529	7,977	91,869	6,383 ^d	429	0.07	0.86	0.06	0.00	106,657	0.13
2017	1,723,000	583,429	2,306,429	5,717	86,272 ^d	38,324 ^d	2,256	0.04	0.65	0.29	0.02	132,569	0.08
2018	653,200	463,238	1,116,438	932 ^d	132,821 ^d	52,179 ^d	1,847	0.00	0.71	0.28	0.01	187,780	0.29
2019 ^e	521,250	273,536	794,786	2,040 ^d	232,131 ^d	50,388 ^d	2,326 ^e	0.01	0.81	0.18	NA	286,886	~0.55
2020 ^f	183,200	5,865	189,065	7,525 ^d	110,630 ^d	48,263 ^f	NA	NA	NA	NA	NA	166,419	~0.91
2021	93,285	726	94,011	1,561 ^d	NA	NA	NA	NA	NA	NA	NA	NA	NA
2022	170,800	2,814	173,614	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2023	287,900	6,192	294,092	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2024	161,100	3,327	164,427	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Average	651,641	286,212	937,853									889,318	1.61
Brood years 1974–2018:													
Average	707,026	317,875	1,024,900	31,392	654,666	224,310	8,402	0.03	0.70	0.26	0.01	918,770	1.65
Even years	557,900	284,279	842,179	23,064	471,197	193,677	8,224	0.03	0.68	0.28	0.01	696,162	1.42
Odd years	862,930	352,998	1,215,927	40,098	846,474	256,336	8,589	0.03	0.72	0.24	0.01	1,151,496	1.88
Minimum	220,900	27,769	249,542	0	86,272	6,383	0	0.00	0.41	0.03	0.00	106,657	0.08
Maximum	2,355,500	677,257	2,828,562	196,016	2,064,154	721,548	34,820	0.16	0.87	0.56	0.08	2,951,574	9.02

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Note: Minimum and maximum indicate the lowest and highest values for each year presented through brood year 2018.

- ^a The estimated number of salmon that returned is based upon annual age composition observed in Lower Yukon test fishery gillnets each year, weighted by test fishery catch per unit effort.
- ^b Drainagewide escapement back to 1974 is based on Bayesian analysis, which began in 2014.
- ^c Based upon expanded test fishery age composition estimates for years in which the test fishery terminated early both in 1994 and 2000.
- ^d Combination of Mt. Village test fishery weighted ages with Lower Yukon test fishery to bolster sample sizes.
- ^e The brood year return for 3-, 4-, and 5-year fish indicates that production (R/S) from brood year 2019 was approximately 0.55. Recruits are estimated for an incomplete brood year, denoted by shaded values.
- ^f The brood year return for 3- and 4-year fish indicates that production (R/S) from brood year 2020 was approximately 0.91. Recruits are estimated for an incomplete brood year, denoted by shaded values.

Table 5.–Summary of 2025 fall chum salmon escapement counts compared to existing goals.

Stock/location	Assessment method	2025 Escapement	Goal type	Goals	Year established	Primary source
Fall chum salmon stock						
Yukon River drainage	Bayesian	179,600 ^a	SEG	300,000–600,000	2010	Fleischman and Borba (2009)
Teedriinjik (Chandalar River)	Sonar	65,817	SEG	85,000–234,000	2019	Liller and Savereide (2018)
Sheenjek River	Sonar	19,083	none	–	–	–
Delta River	Ground surveys	6,972	SEG	7,000–20,000	2019	Liller and Savereide (2018)
Fishing Branch River	Weir/sonar	7,858	IMEG	22,000–49,000	2010	JTC (2010)
Canada (upper Yukon River)	Sonar-harvest	19,574	IMEG	70,000–104,000	2008	JTC (2008)
Porcupine River (Canada Portion)	Sonar-harvest	11,918	none	–	–	–

Note: BEG = biological escapement goal; IMEG = interim management escapement goal; SEG = sustainable escapement goal. En dash = no data.

^a A statistical model is used to estimate escapement

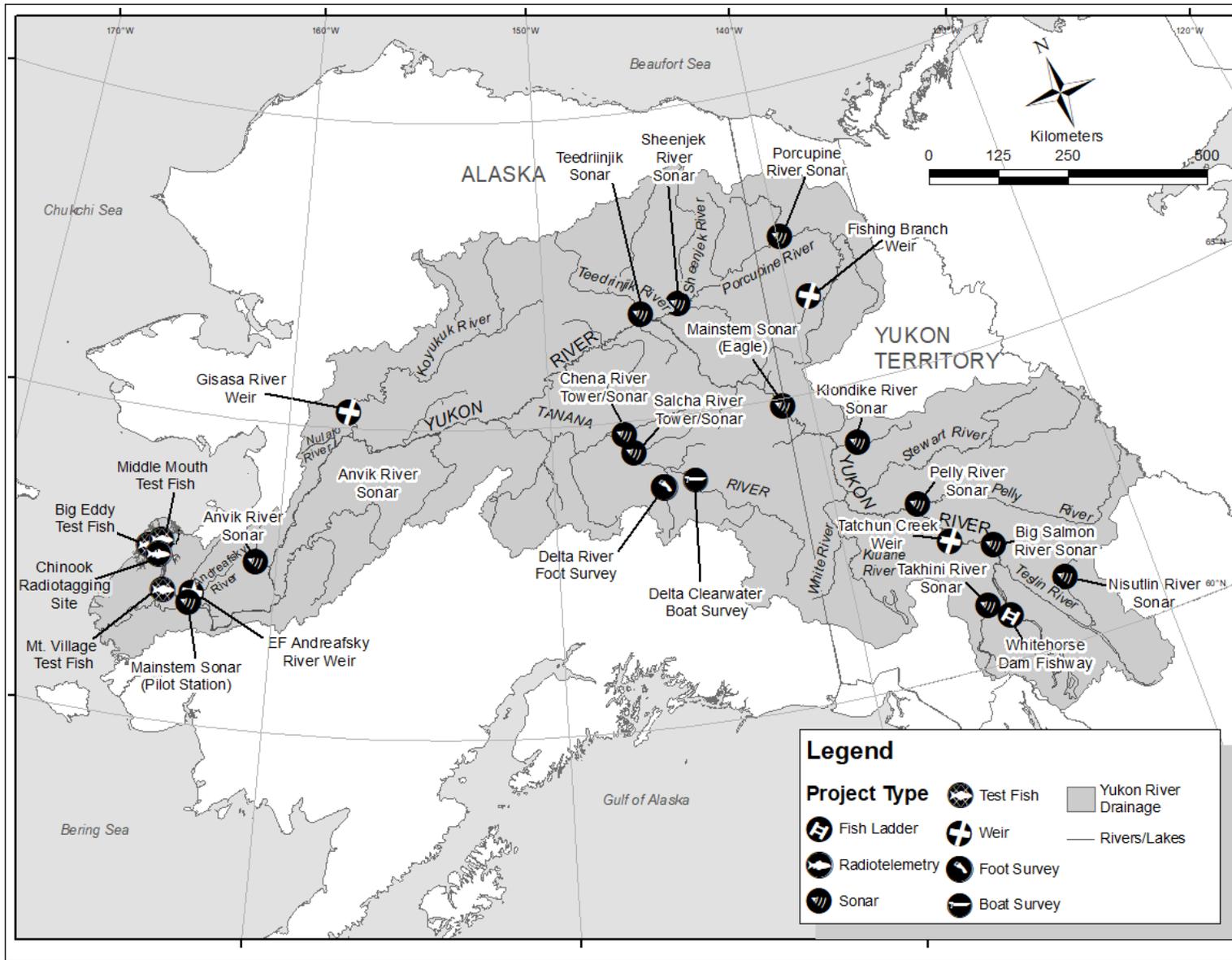


Figure 1.—Map of the Yukon River drainage showing select salmon monitoring projects. Does not show aerial surveys.

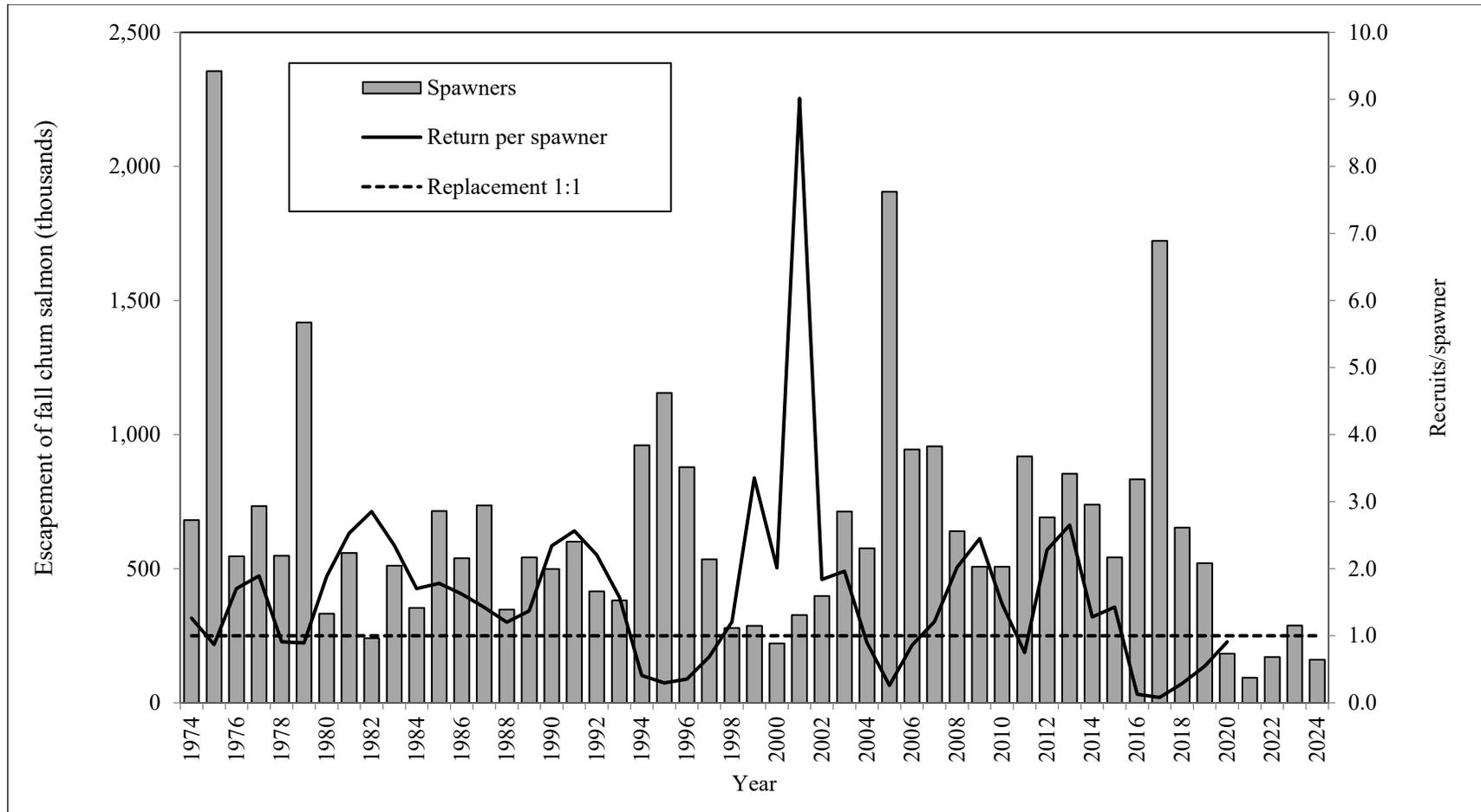


Figure 2.—Estimated historical productivity of Yukon River fall chum salmon, 1974–2024.

Note: Incomplete brood years 2019 and 2020 are estimated.

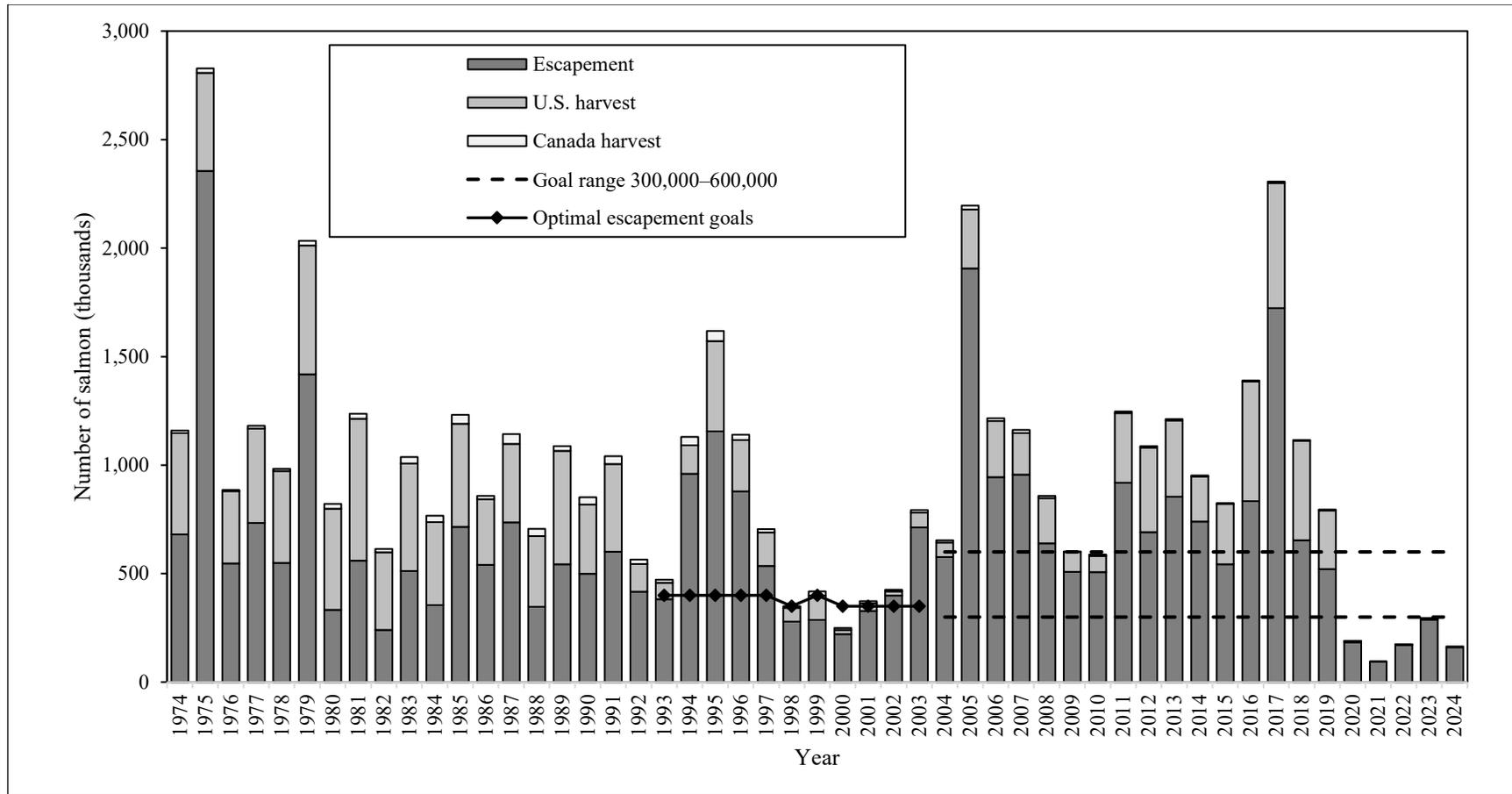


Figure 3.—Total run reconstruction based on estimated harvest and escapement of fall chum salmon, Yukon River drainage, 1974–2024.

Note: The drainagewide escapement goal of 400,000 fall chum salmon was established in 1993. In 1996, an optimal escapement goal of 350,000 fall chum salmon was established in the *Yukon River Fall Chum Salmon Management Plan* and was utilized in 1998, 2000, and 2001. In 2004, a drainagewide escapement goal range of 300,000 to 600,000 fall chum salmon was established.

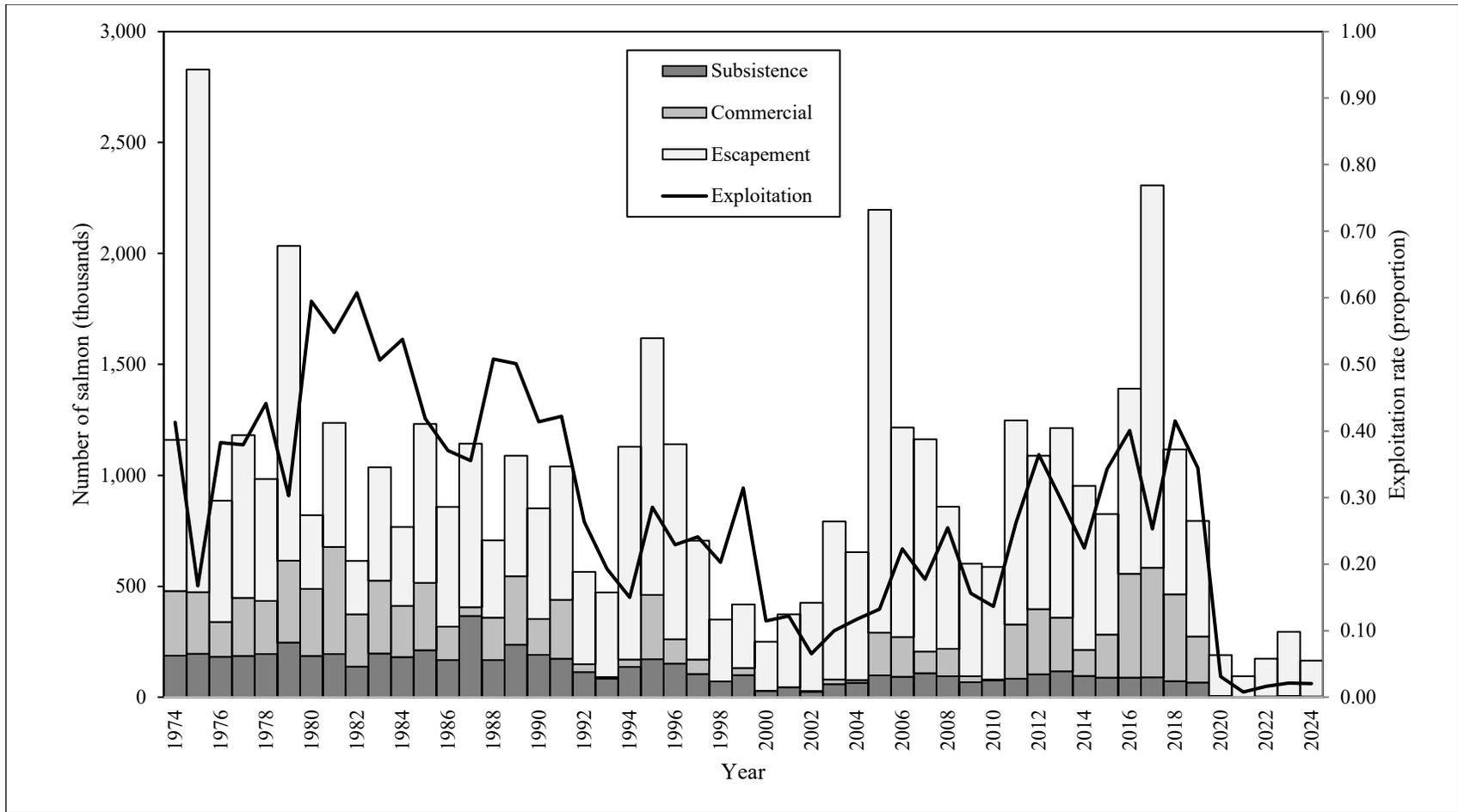


Figure 4.—Estimated fall chum salmon drainagewide harvest and escapement with exploitation rate, Yukon River drainage, 1974–2024.

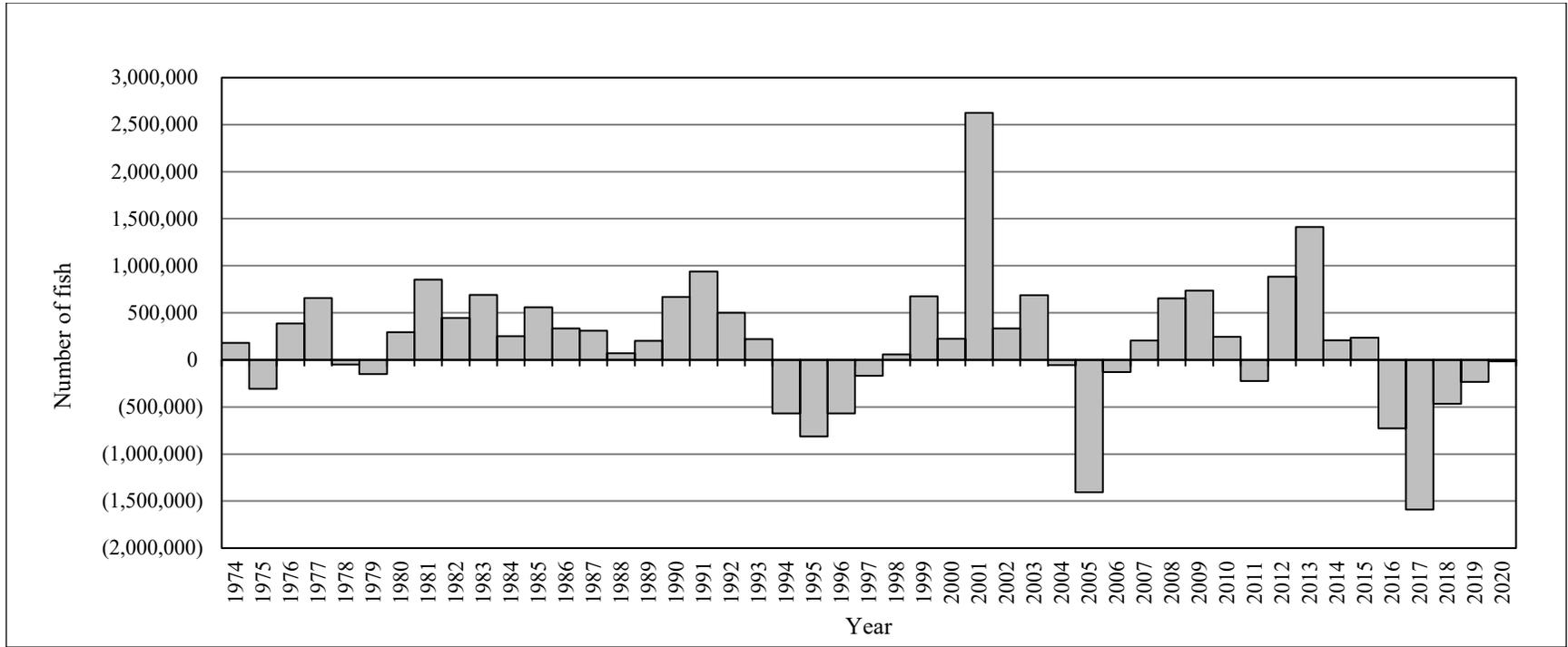


Figure 5.—Net replacement of fall chum salmon based on parent-year escapements and resulting brood year returns, 1974–2020.

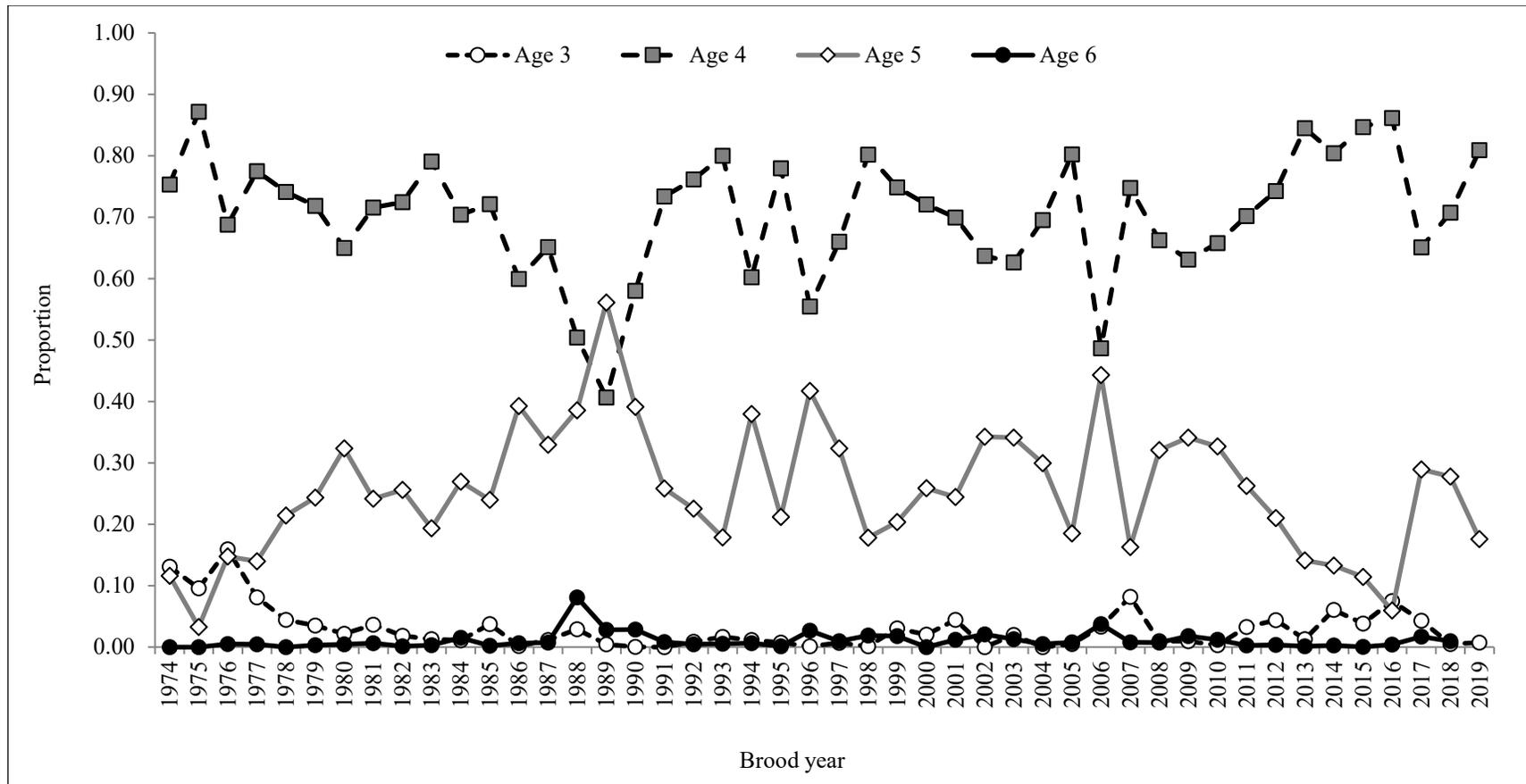


Figure 6.— Fall chum salmon proportion-at-age from brood years, 1974–2019.