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Situk River Chinook and Sockeye Salmon Sport Harvest Estimates, 2022

by

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and

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April 2024

Alaska Department of Fish and Game **Divisions of Sport Fish and Commercial Fisheries**

Symbols and Abbreviations

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Weights and measures (metric)

centimeter	cm
deciliter	dL
gram	g
hectare	ha
kilogram	kg
kilometer	km
liter	L
meter	m
milliliter	mL
millimeter	mm

Weights and measures (English)

cubic feet per second	ft^3/s
foot	ft
gallon	gal
inch	in
mile	mi
nautical mile	nmi
ounce	oz
pound	lb
quart	qt
yard	yd

Time and temperature

day	d
degrees Celsius	°C
degrees Fahrenheit	°F
degrees kelvin	K
hour	h
minute	min
second	s

Physics and chemistry

all atomic symbols	
alternating current	AC
ampere	A
calorie	cal
direct current	DC
hertz	Hz
horsepower	hp
hydrogen ion activity (negative log of)	pH
parts per million	ppm
parts per thousand	ppt, ‰
volts	V
watts	W

General

Alaska Administrative Code	AAC
all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.
all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.
at	@
compass directions:	
east	E
north	N
south	S
west	W
copyright	©
corporate suffixes:	
Company	Co.
Corporation	Corp.
Incorporated	Inc.
Limited	Ltd.
District of Columbia	D.C.
et alii (and others)	et al.
et cetera (and so forth)	etc.
exempli gratia (for example)	e.g.
Federal Information Code	FIC
id est (that is)	i.e.
latitude or longitude	lat or long
monetary symbols (U.S.)	$, ¢
months (tables and figures): first three letters	Jan,...,Dec
registered trademark	®
trademark	™
United States (adjective)	U.S.
United States of America (noun)	USA
U.S.C.	United States Code
U.S. state	use two-letter abbreviations (e.g., AK, WA)

Mathematics, statistics

all standard mathematical signs, symbols and abbreviations	
alternate hypothesis	H_A
base of natural logarithm	e
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics	(F, t, χ^2, etc.)
confidence interval	CI
correlation coefficient (multiple)	R
correlation coefficient (simple)	r
covariance	cov
degree (angular)	°
degrees of freedom	df
expected value	E
greater than	>
greater than or equal to	≥
harvest per unit effort	HPUE
less than	<
less than or equal to	≤
logarithm (natural)	ln
logarithm (base 10)	log
logarithm (specify base)	$\log_2$, etc.
minute (angular)	'
not significant	NS
null hypothesis	H_O
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	"
standard deviation	SD
standard error	SE
variance	
population	Var
sample	var

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ABSTRACT

During 2022, sport angling effort, catch, and harvest information was estimated on the Situk River using creel sampling interviews. This sampling was targeted at anglers fishing for Chinook salmon *Oncorhynchus tshawytscha* and sockeye salmon *O. nerka* on the Situk River from approximately 9 June through 31 July. A 2-sampler survey methodology was used, with 1 sampler stationed at the primary lower river access point each day, and a second sampler rotating between 2 access points on alternating days. The Chinook salmon sport fishery was closed on the Situk River by management action prior to the season due to low abundance, but was reopened on 24 July due to the midpoint of the goal range being achieved. The estimated number of Chinook salmon caught was 63 fish with 4 jack Chinook salmon harvested. The estimated sockeye salmon catch was 22,020 fish, and estimated sockeye salmon harvest was 14,325 fish. Angler effort, measured in the number of hours fished, was estimated at 18,868 hours. Foot traffic was the most common access type used by anglers, whereas jet boat and motorboat travel were the least. Most participants in the fishery were unguided and nonresident anglers.

Keywords: Chinook salmon, *Oncorhynchus tshawytscha*, sockeye salmon *Oncorhynchus nerka*, harvest, escapement, biological escapement goal, creel survey, Situk River, Yakutat, Southeast Alaska

INTRODUCTION

The Situk River is located approximately 16 km southwest of the remote coastal community of Yakutat, Alaska (Figure 1). The Situk River is relatively small, with a mean summer discharge ranging from 5.7 to 8.5 m^3/s (Gubernick and Paustian 2007), and a total watershed area of 397 ha (Marston et al. 2013). The mainstem of the Situk River originates in 2 headwater lakes and is fed by 2 tributaries (the West Fork River and the Old Situk River), and flows 29 km into the Gulf of Alaska via Situk-Ahrnklin Lagoon (Figure 1). The Situk is home to important freshwater sport fisheries for Chinook *Oncorhynchus tshawytscha* and sockeye salmon *O. nerka* that provide significant economic benefit for the local economy and are utilized by both resident and nonresident anglers. The sport fisheries in the Situk River have provided some of the only opportunities for anglers to harvest Chinook (king) salmon in fresh waters of Southeast Alaska, and the Situk River sockeye salmon freshwater sport fishery is the largest in the region. Chinook and sockeye salmon are also important subsistence and commercially sought species in the Yakutat area.

The Situk-Ahrnklin Inlet and Lost River Chinook Salmon Fisheries Management Plan (SCMP; 5 AAC 30.365) delineates specific multi-fishery management steps to preclude allocation conflicts and to meet escapement goal requirements. Biological escapement goals (BEGs) have been calculated for both Chinook and sockeye salmon in the Situk River. The Chinook salmon BEG is 450 to 1,050 large (≥28″) Chinook salmon (McPherson et al. 2005), and the sockeye salmon BEG is 30,000 to 70,000 fish (Clark et al. 2002). Fishery managers assess Chinook and sockeye salmon abundance on the Situk River with a weir located just above tidal influence (Figure 1). Commercial gillnet fisheries are prosecuted below the weir in the Situk-Ahrnklin Lagoon. Although subsistence gillnet fisheries can legally occur in the river, for fish quality reasons, most subsistence salmon are taken within the lagoon (below the weir). Significant above-weir and inriver harvest of salmon is limited to the sport fishery. Inseason escapement is calculated by subtracting the above-weir harvest of the sport fishery from the weir count data. Data on abundance and run timing from previous years are used to project expected escapement for any given week. If expected escapement differs markedly from current escapement, daily bag limits can be altered by management to restrict or liberalize harvest potential to achieve the escapement goals. Commercial fishing openers are also altered with similar rationale using this information.

The creel survey project described in this report, conducted by the Alaska Department of Fish and Game (ADF&G), Division of Sport Fish (SF), assessed inseason catch and harvest of Chinook and sockeye salmon, fishing effort, and other fishery characteristics of the freshwater Situk River sport fishery. This study is consistent with those documented in past reports during the years 1998 to 1999 (Johnson 2001), 2000 to 2003 (Johnson 2005), and 2004 to 2007 (Johnson 2008), with creel surveys with different methodologies occurring prior to 1998 (Johnson et al. 1991; Glynn 1992). This report describes the results of the Situk River freshwater sport fishery creel survey for the year 2022.

OBJECTIVES

1. To provide inseason estimates of the number of large (≥28″) Chinook salmon harvested by anglers exiting the Situk River access locations such that, by the end of the season, the resulting estimate of total escapement is within 25% of the true value 95% of the time.
2. To estimate the age composition of Chinook salmon harvested by the sport fishery in the Situk River above and below the weir, such that the proportion of fish ocean-age-3 or older is within 15% of the true value 90% of the time.

SECONDARY OBJECTIVES

1. Estimate the harvest of sockeye salmon during 9 June through 31 July, from 1000 to 2300 hours above and below the weir by anglers exiting the Situk River access locations.
2. Estimate the total angler effort and catch of Chinook and sockeye salmon by anglers exiting the Situk River access locations during 9 June through 31 July, from 1000 to 2300 hours.
3. Estimate the proportions of guided versus unguided trips, type of access used by the angler, and residency status of the angler (resident or nonresident).
4. Collect angler observations on inriver Chinook salmon distribution and movement.

METHODS

SINGLE-SAMPLER EXPANSION AND 2-SAMPLER METHODOLOGY

Chinook and sockeye salmon angling on the Situk River originates and terminates at 3 access points. These points are the Lower Landing, Maggie John Trail, and the Nine Mile Bridge of Forest Highway 10 (Figure 1). Anglers begin float trips from the Nine Mile Bridge, proceeding downstream to the Lower Landing, boat upstream from the Lower Landing then return, or hike in from all 3 access points. A stratified 2-stage "direct expansion" survey of anglers exiting the Situk River was used to estimate Chinook and sockeye salmon catch and harvest, angler effort, and other fishery characteristics.

Sampling began on 9 June and concluded on 31 July. The daily sampling schedule timing, used since 2006, was the same for all 3 sampling locations (1000–1630 and 1630–2300 hours). Because the Lower Landing is the primary angler access point, a sampler was stationed at that location during each sampling day. The second sampler systematically rotated between the Maggie John Trail and Nine Mile Bridge so that these locations were sampled every other day, except the scheduled days off (Table 1).

This 2-stage survey design had "days" within each location per time of day (TOD) stratum as primary sampling units and "anglers within days" as secondary sampling units following a TOD stratified design (Bernard et al. 1998). When a "day" was selected for sampling within each location per TOD stratum, the entire sampling period was covered. On each sampling "day," all anglers seen exiting the Situk River fishery between the start and stop hours defining each period were interviewed, if possible, or were counted if they were unable to be interviewed.

This method produced data to calculate fishery statistic estimates (number of hours, number of fish caught and harvested by species, etc.) per each stratum from the 3 access sites; these estimates were then summed to calculate a total yearly estimate. As designed, the creel survey covered a large fraction, but not all, of angling effort because sport fishing occurred outside the project dates and sampling hours. In order to accomplish primary project objectives, an expansion factor was utilized to multiply the calculated Chinook harvest stratum estimates into total year end estimates per stratum ($\widehat{N}_{ht}$). The relationship between the ADF&G Alaska Sport Fishing Survey (commonly known as the Statewide Harvest Survey [SWHS]) and the creel observations at Lower Landing was used to derive an expansion factor (E_1) to expand the creel observations per stratum up to year-end estimates (Figure 2). The expansion factor was based only on estimates obtained at Lower Landing, or what was referred to in previous studies as the "single-sampler" method due to it only being collected at one location (Marston and Power 2016). This is because there has not been an open Chinook salmon sport fishery in the Situk River since the project went to a 2-sampler methodology in 2010. The calculation of fishery statistics and analysis of this method's data is found in the *Data Analysis* section.

DATA ANALYSIS

EFFORT, CATCH, AND HARVEST

Angler effort (in hours), catch, and harvest of Chinook and sockeye salmon in each stratum were estimated using procedures for a stratified 2-stage sample survey (Cochran 1977) where "days" were first stage sampling units and "anglers" were second stage sampling units. Location and time of day were considered their own strata. First, the mean harvest (or catch or effort) was obtained from all anglers interviewed within each sampled day and location:

$$\bar{n}_{hi} = \frac{\sum_{j=1}^{m_{hi}} n_{hij}}{m_{hi}} \quad (1)$$

Where n_{hij} was the number of Chinook salmon harvested (or caught, etc.) by interviewed person *j* during sampled day *i* for location/TOD stratum *h,* and m_{hi} was the number of people interviewed during each day. This estimate was then expanded by the number of people (counted) who exit the site during the day (M_{hi}) to estimate a total for each sampled day:

$$\widehat{N}_{hi} = M_{hi}\bar{n}_{hi} \quad (2)$$

The mean harvest over all days sampled within each stratum was then estimated:

$$\bar{\widehat{N}}_h = \frac{\sum_{i=1}^{d_h} \widehat{N}_{hi}}{d_h}, \quad (3)$$

where d_h was the number of days sampled in each stratum. This estimate was multiplied by the number of days in the stratum (D_h) to estimate a total for each stratum:

$$\widehat{N}_h = D_h \bar{\widehat{N}}_h \tag{4}$$

The strata corresponded to the early and late period of sampling at the lower landing, as well as at Nine Mile Bridge and the Maggie John Trailhead.

For either the single-sampler or the 2-sampler method, there was harvest that occurred outside of the sampling schedule either extending beyond the season of sampling or extending beyond the hours of sampling within the season. For the 2-sampler method, this harvest was considered to be small because all of the main fishery exits were sampled. However, for the single-sampler method, the harvest that occurred via the other main exit locations was more substantial. As such, for the single-sampler method, an expansion factor (Figure 2) was needed to multiply the calculated stratum estimates into expanded year-end estimates per stratum ($\widehat{N}_{eh}$). We used the relationship between the ADF&G SWHS estimate of Chinook salmon harvest and this creel estimate of Chinook salmon harvest to derive an expansion factor (E_1) equal to 1.19 (SE = 0.159) to expand the creel estimates per stratum. Those estimates $\left(\widehat{N}_{eh}\right)$ were then added to give the expanded year-end estimates for the single-sampler method $\left(\widehat{N}_1\right)$.

$$\widehat{N}_1 = \sum_h \widehat{N}_{eh} = \sum_h (\widehat{N}_h * E_1) \tag{5}$$

For the 2-sampler method, final total drainage year-end statistics ($\widehat{N}_2$) were calculated by summing strata estimates, and no expansion factor was used.

$$\widehat{N}_2 = \sum_h \widehat{N}_h \tag{6}$$

Estimates of catch and angler effort were obtained similarly by substituting the appropriate statistics (catch or effort) into equations (1) through (4), above. Similar substitutions were obtained to estimate resident versus nonresident trips, guided versus nonguided trips, and type of access used by the angler.

The variance of the stratum estimates was estimated:

$$\hat{V}\left[\widehat{N}_h\right] = (1 - f_{1h}) D_h^2 \frac{S_{1h}^2}{d_h} + \frac{D_h}{d'_h} \sum_{i=1}^{d'_h} \hat{V}\left[\widehat{N}_{hi}\right] \tag{7}$$

where $f_{1h} = d_h / D_h$ was the sample fraction for "days", S_{1h}^2 was sample variance among "days", and $d_h^{'}$ was the number of days in which s_{2hi}^2 (see below) were estimable (i.e., when at least 2 people were interviewed or the number interviewed equaled the number counted). The among-day sample variance for days selected systematically for sampling (the mid-day stratum for all locations and late-day stratum for Maggie John Trailhead and Nine Mile Bridge) was estimated using an approximation proposed by Wolter (1985):

$$S_{1h}^2 \approx \frac{\sum_{i=2}^{d_h} \left(\widehat{N}_{hi} - \widehat{N}_{h(i-1)}\right)^2}{2(d_h - 1)} \tag{8}$$

The among-angler variance component (usually 0 in this survey because all anglers exiting the fishery were interviewed) was estimated by:

$$\hat{V}[\hat{N}_{hi}] = \left(1 - \frac{m_{hi}}{M_{hi}}\right) M_{hi}^2 \frac{s_{2hi}^2}{m_{hi}} \tag{9}$$

where s_{2hi}^2 was the among-angler sample variance:

$$s_{2hi}^2 = \frac{\sum_{j=1}^{m_{hi}} (n_{hij} - \bar{n}_{hi})^2}{m_{hi} - 1} \tag{10}$$

Sampling in the late-day stratum was semi-systematic, i.e., it had non-regular sampling intervals among sampling days. However, if 2 consecutive days were considered as a single sampling unit (see sampling schedule in Table 1), then sampling became systematic with respect to the new 2-day sampling units. In this case, equations 1–11 could still be used for the late-day stratum at Lower Landing with the appropriate substitutions. For example, n_{hij} would become the number of Chinook salmon harvested (or caught, etc.) by interviewed person *j* during sampled 2-day period *i* for late-day stratum; the number of days sampled, d_h, would become the number of 2-day units sampled; the total for each sampled day, $\hat{N}_{hi}$, would become the total for each 2-day sampling unit; and the number of days in the stratum, D_h, would become the number of 2-day units in the late-day stratum; etc.

For the single-sampler method expanded estimates for stratum estimates were obtained by multiplying $\hat{N}_h$ in turn by the expansion factor ($\hat{E}_1$ = 1.19, SE = 0.15; Figure 2) to account for harvest outside the framework of the creel survey design; therefore, the variance for the expanded stratum was calculated by the application of Goodman's (1960) formula and those independent variances $\hat{V}[\hat{N}_{eh}]$ were summed to give the variance for the single-sampler method $\hat{V}[\hat{N}_1]$:

$$\hat{V}[\hat{N}_1] = \sum_h \hat{V}[\hat{N}_{eh}] = \sum_h (\hat{N}_h^2 \hat{V}[\hat{E}_1] + \hat{E}_1^2 \hat{V}[\hat{N}_h] - \hat{V}[\hat{E}_1]\hat{V}[\hat{N}_h]) \tag{11}$$

For the single-sampler method, the 2 strata corresponded to the early and late period of sampling at the lower landing.

For the 2-sampler method, variances of strata were also summed. The strata of the 2-sampler method corresponded to the early and late period of sampling at the Lower Landing and the sampling that occurred at the Nine Mile Bridge and the Maggie John Trailhead. The variance for the 2-sampler method was written as:

$$\hat{V}[\hat{N}_2] = \sum_h V(\hat{N}_h) \tag{12}$$

Variances of the stratum estimates of catch by species and angler effort were obtained similarly, by substituting the appropriate catch and effort statistics into equations 7–10.

RESULTS

There were 1,150 interviews conducted in 2022 at all 3 access locations in the 32 days that sampling occurred. Estimated hours fished for all salmon during the 9 June to 31 July survey period was 18,868 hours (SE = 1,450; Table 2). Effort in the sport fishery was primarily expended by nonresident, unguided anglers who accessed the sport fishery by foot (Table 2).

In 2022, no large (≥28″) Chinook salmon were estimated to be harvested above the Situk River weir in the sport fishery (Table 3). No large Chinook salmon were harvested below the Situk weir; however, 4 (≤28″) jack Chinook salmon were estimated to be harvested (Table 3). The estimate of all sizes of Chinook salmon caught in the entire river was 63 fish (SE = 22; Table 3).

Estimated sockeye salmon catch during the 9 June to 31 July survey period was 22,020 fish (SE = 1,919; Table 4). Estimated sockeye salmon harvest from 9 June to 31 July above the Situk weir was 4,114 fish (SE = 752; Table 4). Estimated sockeye salmon harvest from 9 June to 31 July below the Situk weir was 10,211 fish (SE = 921; Table 4). Sockeye salmon harvest in the sport fishery was primarily by nonresident, unguided anglers who accessed the sport fishery by foot (Table 5).

Most anglers interviewed during the study years were nonresidents. The proportion of resident anglers was 0.05 (SE = 0.006; Table 6). The proportion of nonresidents was 0.95 (SE = 0.006; Table 6).

Most anglers interviewed during study years were unguided. The proportion of guided anglers was 0.20 (SE = 0.012; Table 7). Conversely, the proportion of unguided anglers was 0.80 (SE = 0.012; Table 7).

Most anglers interviewed during 2022 accessed the river on foot, and drift boats were the next most common type of access (Table 8). Motorboat and jet boat access were the least common types of access. The proportion of anglers accessing the river on foot was 0.75 (SE = 0.013), whereas the proportion using drift boats was 0.18 (SE = 0.011; Table 8).

DISCUSSION

Due to staffing issues at the Situk weir, the 2 creel technicians for this project did not start until 14 June, 5 days after the preferred start date listed in the operational plan. Both technicians were able to collect interviews at all 3 locations for 2022.

The Chinook salmon sport fishery was closed again to start the 2022 season, making this the 18th year in a row this management action was taken. Based on achievement of the escapement goal, the fishery was opened downstream of the weir on 24 July. The sport catch and harvest was anticipated to be low given the reduced passage of Chinook salmon past the Situk weir, and this was realized with only 4 jack Chinook salmon estimated as harvested during the whole fishery. Recent low harvests and catch levels continue to be a result of regulatory measures that have closed or restricted sport fishing for Chinook salmon on the Situk River in response to a persistent period of low productivity for the population (Marston and Power 2016). Low Chinook salmon harvest and catch due to regulatory restrictions were also documented in previous study years, reflecting the long-term nature of this period of low abundance and its effect on the sport fishery (Catterson and Huang 2024).

The estimated angler effort of 18,868 angler hours was the highest recorded since 2017 and was the fourth highest since this project started in 1998. Angler effort for Situk sockeye salmon since the 2020 Covid-19 pandemic has rebounded significantly, with 3 consecutive years of increased effort. This study continues to show that the majority of fishing effort spent on the Situk River is by nonresident, unguided anglers who primarily access the fishery by foot. These trends in angler type, guide usage, and access type are similar to those documented in previous years, suggesting these characteristics of the fishery are stable. The Situk River is an easily accessible stream along the road system with multiple foot access points and an infrastructure in the community of Yakutat, Alaska, such as an abundance of lodging and car rental businesses, that make do-it-yourself fishing trips easy to execute. Future studies could assess how the geographical distribution of fishing effort on the Situk River may be changing over time. Anecdotal reports indicate that more fishing effort is occurring in the upper portions of the watershed compared to previous years when most fishing occurred in the lower river. Understanding changes to where fishing occurs on the river could be useful to management and guide future creel survey design.

The estimate of 14,325 total harvest of sockeye salmon was the largest recorded in the history of this study. The next closest sockeye salmon harvest estimate was 9,606 sockeye salmon harvested in 2004. Approximately 71% of the 14,325 sockeye salmon harvested in 2022 were harvested below the weir. This corresponds with the majority of effort and interviews conducted at the Lower Landing boat launch and reaffirms that location as the primary access point for sockeye salmon fishing among foot anglers. The record-high 2022 sockeye salmon harvest estimate corresponds to an escapement (90,742 fish) that surpassed the upper bound (70,000 fish) of the BEG, following a trend of consecutive large escapements since 2019. The sockeye salmon fishery was liberalized from 3 to 6 fish per day on 4 July, which was the earliest the sport fishery was liberalized since 2013. The early liberalization almost certainly contributed to the highest harvest estimated since this project was started in the late 1990s.

The primary purpose of this study has been to provide inseason estimates of the number of large Chinook salmon harvested in the Situk River, and to estimate the age composition of harvested Chinook salmon. This information was combined with daily weir counts to calculate daily escapement estimates and guide inseason management actions to achieve the BEG for Chinook salmon on the Situk River. This objective remains important considering very low Chinook salmon harvest levels due to management restrictions implemented to meet the BEG. Further, this study would benefit from broadening its scope to more fully assess sockeye salmon. Investigating a correlation of sockeye salmon harvests between this project and the SWHS done by ADF&G would help to expand estimates of sockeye salmon and aid in projecting escapement during the season on the Situk River.

Although the specific objectives and methodologies of this creel survey have evolved over the years, this study provides important information to area biologists who are making inseason management decisions to meet escapement goals. Additionally, creel samplers stationed at fishery access points during the study period provide valuable regulatory, management, and educational information to anglers participating in this popular sport fishery. Continued high levels of fishing effort combined with prolonged low abundance of Situk River Chinook salmon support the need for continued close monitoring of this important sport fishery.

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TABLES

Table 1.–Summary of stratification structure and sampling characteristics for the 2-sampler survey at the Lower Landing, Nine Mile Bridge, and Maggie John Trailhead, 9 June to 31 July.

Location[a]	TOD stratum	Time of day	Total number of days	Sampling method for days[b]	Days sampled
LL	Mid-day	1000–1630	53	SYS	16
	Late-day	1630–2300	53	SYS	16
MJT	Mid-day	1000–1630	53	SYS	8
	Late-day	1630–2300	53	SYS	7
NMB	Mid-day	1000–1630	53	SYS	8
	Late-day	1630–2300	53	SYS	8

[a] LL= Lower Landing; MJT = Maggie John Trailhead; NMB = Nine Mile Bridge.

[b] SYS = systematic sampling.

Table 2.–Estimated hours fished for all salmon from 9 June to 31 July in the Situk River sport fishery, from 2018 to 2022.

	Total effort		Effort by residency		Effort by angler type		Effort by conveyance				
Year	Hours	SE	Nonresident	Resident	Guided	Unguided	Foot[a]	Jet[b]	Prop[c]	Drift[d]	Unknown
2018	12,811	1,510	12,488	323	4,440	8,371	8,126	376	205	3,526	578
2019	15,427	1,280	14,961	466	2,472	12,955	11,854	763	100	2,695	–
2020	9,891	946	8,704	1,187	1,321	8,570	7,867	596	40	1,367	–
2021[e]	12,228	816	11,807	421	5,174	7,054	6,200	790	332	4,906	–
2022	18,868	1,450	17,915	953	4,059	14,809	14,599	106	754	3,409	–

Note: The current study year is highlighted in gray.

[a] Mode of travel by foot.

[b] Mode of travel by jet boat.

[c] Mode of travel by motorboat (prop).

[d] Mode of travel by drift boat with oars.

[e] 2021 estimates are for Lower Landing only and do not include estimates from Maggie John trail or Nine Mile Bridge.

Table 3.–Expanded estimates of Chinook salmon harvest by size above and below the Situk River weir, and Chinook salmon catch from the entire river from 2018 through 2021.

	Above weir		Below weir		Above weir		Below weir		Above weir		Below weir		Entire river	
Year	Large Chinook salmon harvest	SE	Large Chinook salmon harvest	SE	Small Chinook salmon harvest	SE	Small Chinook salmon harvest	SE	Jack Chinook salmon harvest	SE	Jack Chinook salmon harvest	SE	Catch (all sizes)	SE
2018	0	0	0	0	0	0	0	0	0	0	0	0	112	31
2019	0	0	0	0	0	0	0	0	0	0	0	0	160	32
2020	0	0	0	0	0	0	0	0	8	8	11	7	435	80
2021[a]	0	0	4	4	0	0	0	0	0	0	0	0	149	43
2022	0	0	0	0	0	0	0	0	0	0	4	4	63	22

Note: Large Chinook salmon are ≥28 inches, small Chinook salmon are ≥20 to <28 inches, and jack Chinook salmon are <20 inches.

Note: The current study year is highlighted in gray.

[a] 2021 estimates are for Lower Landing only and do not include estimates from Maggie John trail or Nine Mile Bridge.

Table 4.–Estimated sockeye salmon catch in the entire river and sockeye salmon harvest above and below the Situk River weir in the Situk River sport fishery during the period from 9 June to 31 July, from 2018 to 2021.

	Entire river		Entire river		Above weir		Below weir	
Year	Sockeye salmon catch	SE	Sockeye salmon harvest	SE	Sockeye salmon harvest	SE	Sockeye salmon harvest	SE
2018	6,295	867	2,135	421	194	128	1,941	401
2019	9,893	1,032	4,692	428	2,029	256	2,663	343
2020	8,763	994	4,660	543	1,982	336	2,677	427
2021[a]	11,597	1,249	4,974	416	1,557	159	3,417	384
2022	22,020	1,919	14,325	1,189	4,114	752	10,211	921

Note: The current study year is highlighted in gray.

[a] 2021 estimates are for Lower Landing only and do not include estimates from Maggie John trail or Nine Mile Bridge.

Table 5.–Estimated sockeye salmon harvest by user type in the Situk River sport fishery during the period from 9 June to 31 July, from 2018 to 2021.

Year	Total harvest	SE	Harvest by residency		Harvest by angler type		Harvest by conveyance				
			Nonresident	Resident	Guided	Unguided	Foot[a]	Jet[b]	Prop[c]	Drift[d]	Unknown
2018	2,135	421	2,054	81	442	1,693	1,517	212	42	272	92
2019	4,692	428	4,555	138	890	3,803	3,324	378	62	925	0
2020	4,660	543	4,143	517	530	4,130	3,861	298	20	454	0
2021[e]	4,974	416	4,833	141	2,143	2,831	2,654	576	78	1,667	0
2022	14,325	1,189	13,765	560	2,845	11,480	11,095	109	639	2,481	0

Note: The current study year is highlighted in gray.

Note: Effort by conveyance was recorded for all study years except 2018 where it was not assigned during interviews and therefore unknown.

[a] Mode of travel by foot.

[b] Mode of travel by jet boat.

[c] Mode of travel by motorboat (prop).

[d] Mode of travel by drifted boat with oars.

[e] 2021 estimates are for Lower Landing only and do not include estimates from Maggie John trail or Nine Mile Bridge.

Table 6.–Estimated proportions and corresponding standard errors (SE) of resident and nonresident anglers participating in the Situk River sport fishery from 9 June to 31 July during 2018 to 2021.

Year	Resident anglers		Nonresident anglers		Sample size
	Proportion	SE	Proportion	SE	
2018	0.04	0.007	0.96	0.007	633
2019	0.04	0.006	0.96	0.006	1,110
2020	0.14	0.014	0.86	0.014	609
2021[a]	0.04	0.007	0.96	0.007	726
2022	0.05	0.006	0.95	0.006	1,140

Note: The current study year is highlighted in gray.

[a] 2021 does not include interviews from Maggie John trail or Nine Mile Bridge.

Table 7.–Estimated proportions and corresponding standard errors (SE) of guided and unguided anglers in the Situk sport fishery from 9 June to 31 July, during 2018 to 2021.

	Guided anglers		Unguided anglers		
Year	Proportion	SE	Proportion	SE	Sample size
2018	0.25	0.017	0.75	0.017	632
2019	0.14	0.010	0.86	0.010	1,110
2020	0.11	0.013	0.89	0.013	609
2021[a]	0.27	0.017	0.73	0.017	726
2022	0.20	0.012	0.80	0.012	1,140

Note: The current study year is highlighted in gray.

[a] 2021 does not include interviews from Maggie John trail or Nine Mile Bridge.

Table 8.–Estimated proportions and corresponding standard errors (SE) of the types of access used by anglers participating in the Situk River sport fishery from 9 June to 31 July, during 2018 to 2021.

	Foot		Drift boat		Motorboat		Jet boat		Sample
Year	Proportion	SE	Proportion	SE	Proportion	SE	Proportion	SE	size
2018	0.74	0.018	0.20	0.016	0.03	0.007	0.04	0.008	598
2019	0.80	0.012	0.14	0.011	0.01	0.003	0.05	0.006	1,110
2020	0.79	0.016	0.12	0.013	0.01	0.004	0.08	0.011	609
2021[a]	0.67	0.018	0.24	0.016	0.04	0.007	0.06	0.009	726
2022	0.75	0.013	0.18	0.011	0.05	0.007	0.01	0.003	1,140

Note: The current study year is highlighted in gray.

[a] 2021 does not include interviews from Maggie John trail or Nine Mile Bridge.

FIGURES

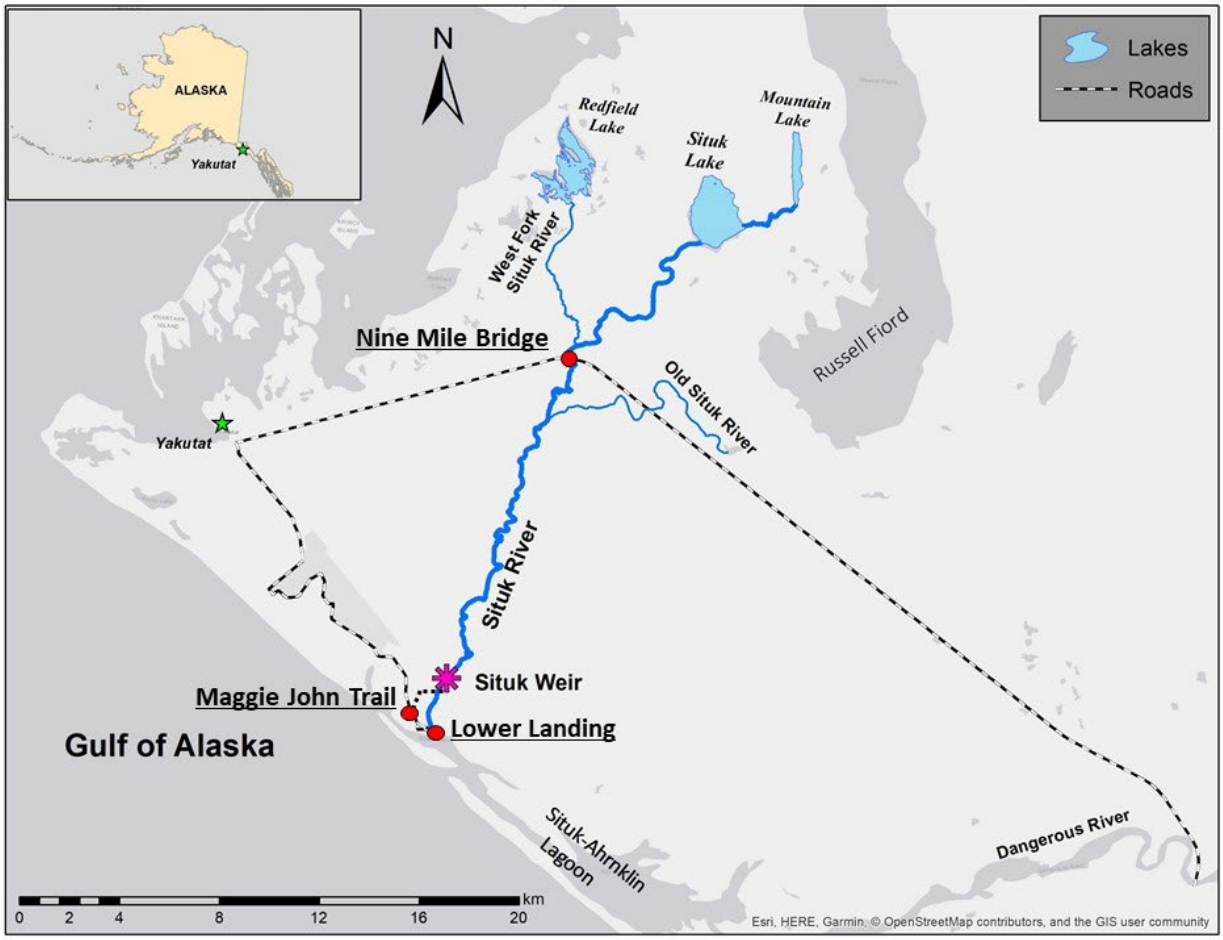

Figure 1.–Map of the Situk River drainage and location of the Situk weir and the 3 access sites of the Situk River creel survey, near Yakutat in Southeast Alaska.

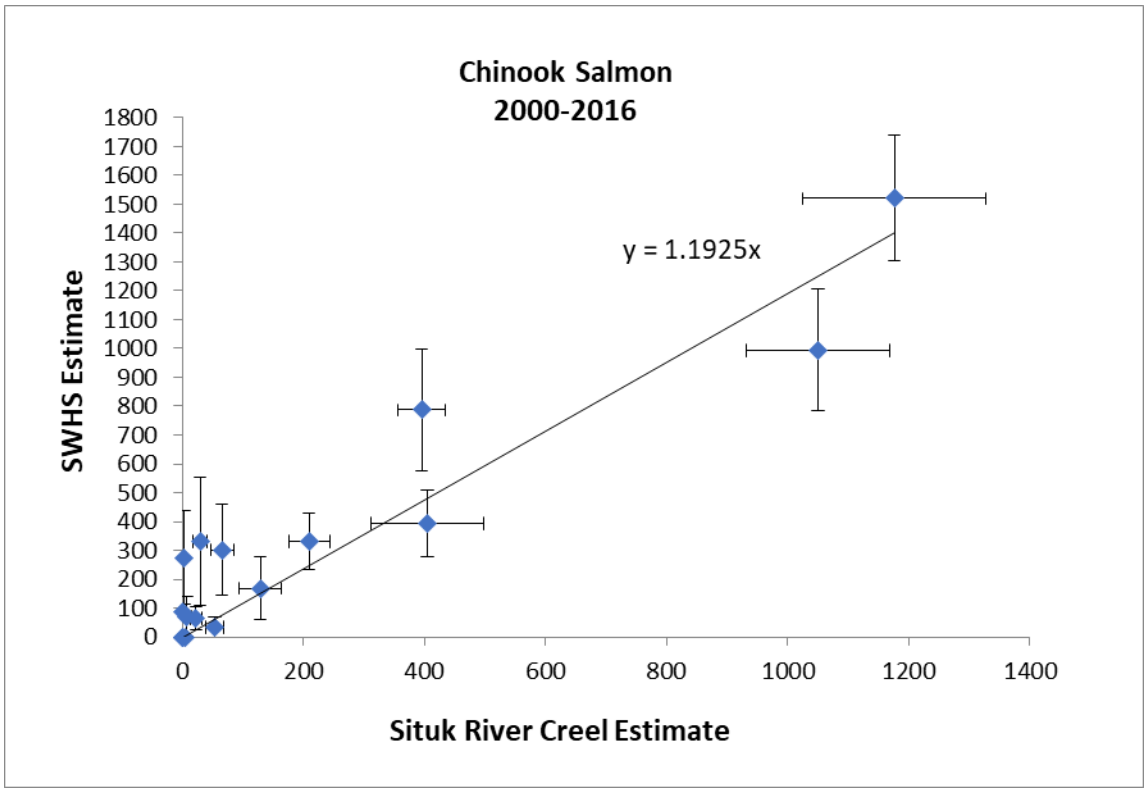

Figure 2.–Situk River Creel survey harvest estimates versus Statewide Harvest Survey estimates for Chinook salmon (all sizes), for both above and below the weir, 2000 to 2016.