Fishery Data Series No. 23-38

Situk River Chinook and Sockeye Salmon Sport Harvest Estimates, 2018–2021

by

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December 2023

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

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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 2018–2021, 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 each year. A 2-sampler survey methodology was used for all study years except 2021, 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. Chinook salmon fisheries were restricted or closed on the Situk River by management actions all years of this report due to low abundance; however, they were reopened in 2020 and 2021. During the study period the estimated number of Chinook salmon (all sizes) caught ranged from 112 to 435 fish, and the number of large (≥28″) Chinook salmon harvested ranged from 0 to 4 fish. Estimated sockeye salmon catch ranged from 6,295 to 11,597 fish, and estimated sockeye harvest ranged from 2,135 to 4,974 fish. Angler effort, measured in the number of hours fished, ranged from 9,891 to 15,427 hours per year. Foot traffic was the most common access method used by anglers, whereas jet boat and motorboat travel were the least common. 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 village 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. The mainstem of the Situk River originates in 2 headwater lakes and is fed by 2 tributaries (the West Fork and the Old Situk rivers), where it flows 29 km into the Gulf of Alaska via the Situk-Ahrnklin estuary (Figure 1). The Situk is home to important freshwater sport fisheries for Chinook *Oncorhynchus tshawytscha* and sockeye salmon *O. nerka*, which 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 opportunity for anglers to harvest Chinook 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, where 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 estuary. Although subsistence gillnet fisheries can legally occur inriver, for fish quality reasons, most subsistence salmon are taken within the estuary (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, management measures such as daily bag limits can be altered to restrict or liberalize harvest potential to help 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 report describes results of the Situk River freshwater sport fishery creel survey for years 2018–2021.

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 0.15 of the true value 90% of the time.

SECONDARY OBJECTIVES

1. Estimate the harvest of sockeye salmon 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 from 9 June through 31 July, from 1000 to 2300 hours.
3. Estimate the proportions of guided versus unguided trips, type of access method used by the angler, and residency status of the angler (resident or nonresident).
4. Collect angler observations on inriver king salmon distribution and movement.

METHODS

TWO-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, and therefore these locations were sampled every other day except the scheduled days off (Table 1).

This 2-stage survey design had "days" within each location/time of day (TOD) stratum as primary sampling units and "anglers within days" as secondary sampling units. Once a "day" was selected for sampling within each location/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 whenever 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 of, but not all, angling effort because sport fishing occurred outside of the project dates and sampling hours. In order to accomplish primary project objectives an expansion factor was utilized to multiply the calculated Chinook salmon harvest stratum estimates into total year end estimates per stratum ($\widehat{N}_{ht}$). The relationship between ADF&G Statewide Harvest Survey (SWHS) and creel observations was used to derive an expansion factor (E_1) to expand the creel observations per stratum up to year-end estimates (Figure 2). The calculation of fishery statistics and analysis of this methods data is found below 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" are first-stage sampling units and "anglers" are second-stage sampling units. Location and time of day were considered their own strata. First, the mean harvest (or catch or effort) is obtained over all anglers interviewed within each sampled day and location:

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

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

$$\widehat{N}_{hi} = M_{hi}\bar{n}_{hi} \tag{2}$$

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

$$\bar{\widehat{N}}_h = \frac{\sum_{i=1}^{d_h} \widehat{N}_{hi}}{d_h} \tag{3}$$

where d_h is the number of days sampled in each stratum. This estimate is 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 correspond 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 is harvest that occurs 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 is considered to be small

because all of the main fishery exits are sampled. However, for the single-sampler method the harvest that occurs via the other main exit locations is more substantial. As such, for the single-sampler method, an expansion factor (Figure 2) is needed to multiply the calculated stratum estimates into expanded year-end estimates per stratum ($\widehat{N}_{eh}$). We used the relationship among 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 ($\widehat{N}_2$) are calculated by summing strata estimates, and no expansion factor is used.

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

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

The variance of the stratum estimates is 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 $f_{1h} = d_h / D_h$ is the sample fraction for "days", S_{1h}^2 is sample variance among "days", and $d_h^{'}$ is the number of days that s_{2hi}^2 (see below) are estimable (i.e., when at least 2 anglers are interviewed or the number interviewed equals 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) is 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 are interviewed) is estimated by:

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

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

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

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

For the single-sampler method expanded estimates for stratum estimates are obtained by multiplying $\widehat{N}_h$ 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 is calculated by the application of Goodman's (1960) formula and those independent variances $\hat{V}[\widehat{N}_{eh}]$ are summed to give the variance for the single sampler method $\hat{V}[\widehat{N}_1]$:

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

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

The 2-sampler method variances of strata are also summed where the strata correspond to the early and late period of sampling at the lower landing and the sampling that occurs at the Nine Mile Bridge and the Maggie John Trailhead. The variance for the 2-sampler method can be written as:

$$\hat{V}[\widehat{N}_2] = \sum_h V(\widehat{N}_{\mathrm{h}}) \qquad (12)$$

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) through (10).

RESULTS

Estimated hours fished for all salmon during the survey period 9 June to 31 July ranged from 9,891 (SE = 946) in 2020 to 15,427 (SE = 1,280) in 2019 (Table 2). Effort in the sport fishery was primarily expended by nonresident, unguided anglers who accessed the sport fishery by foot (Table 2).

In all study years (2018–2021), no large (≥28″) Chinook salmon were estimated to be harvested above the Situk River weir in the sport fishery; however, 8 jack (<20″) Chinook salmon, after expansion, were harvested above the weir in 2020 (Table 3). No large Chinook salmon were harvested below the Situk weir, except 4 fish after expansion in 2021 (Table 3). Expanded estimates of all sizes of Chinook salmon caught in the entire river ranged from 112 (SE = 31) fish in 2018 to 435 (SE = 80) fish in 2020 (Table 3).

Estimated sockeye salmon catch, during the 9 June to July 31 survey period, ranged from 6,295 (SE = 867) fish in 2018 to 11,597 (SE = 1,249) fish in 2021 (Table 4). Estimated sockeye salmon harvest from 9 June to July 31 above the Situk weir ranged from 194 (SE = 128) fish in 2018 to 2,029 (SE = 256) fish in 2019 (Table 4). Estimated sockeye salmon harvest from 9 June to July 31 below the Situk weir ranged from 1,941 (SE = 401) fish in 2018 to 3,417 (SE = 384) fish in 2021 (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 0.04 (SE = 0.006) for all years of the study except in 2020 when the proportion of resident anglers was 0.14 (SE = 0.014; Table 6). The proportion of nonresidents ranged from 0.86 (SE = 0.014) in 2020 to 0.96 (SE = 0.006) for the remaining years (Table 6).

Most anglers interviewed during study years were unguided. The proportion of guided anglers ranged from 0.11 (SE = 0.013) in 2020 to 0.27 (SE = 0.017) in 2021 (Table 7). Conversely, the proportion of unguided anglers ranged from 0.73 (SE = 0.017) in 2021 to 0.89 (SE = 0.013) in 2020 (Table 7).

Most anglers interviewed during the study years accessed the river by foot, with drift boats as the next most common type of access (Table 8). Motorboat and jet boat use were the least common types of access. The proportion of anglers accessing the river by foot ranged from 0.67 (SE = 0.018) in 2021 to 0.80 (SE = 0.012) in 2019, whereas the proportion using drift boats ranged from 0.12 (SE = 0.013) in 2020 to 0.24 (SE = 0.016) in 2021 (Table 8).

DISCUSSION

All study years had 2 samplers that collected data except for 2021. A promotion within ADF&G of the project's Fish and Wildlife Technician III forced the creel study to be conducted with only 1 sampler, and therefore the Lower Landing was the only access location sampled in 2021. This affected the 2021 estimates by not including effort, catch, and harvest from both Maggie John trail and the Nine Mile Bridge access points. Still, with the absence of interviews from those locations, both effort and sockeye salmon catch were the highest observed during the study period of 9 June through 31 July, 2018–2021.

Chinook salmon harvest in the Situk River sport fishery remained at very low levels during the study years (2018–2021). These overall 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). Chinook salmon were estimated to be harvested in only 2 out of the 4 study years, and in each of those years the number of fish harvested was less than 20 fish. Chinook salmon catches were relatively higher compared to the harvest estimates. Reports of high numbers of jack Chinook in 2020 probably contributed to the high catch estimate that year. Low Chinook salmon harvest and catch due to regulatory restrictions were also documented in previous study years, reflecting the long-term nature of this conservation concern and its effect on the sport fishery (Catterson and Huang *In prep*). Estimates of harvest were only observed in 2020 and 2021 when the sport fishery was reopened after starting the season closed. In both years the sport fishery was reopened in late July toward the end of the runs, which led to low harvest numbers.

Due to the very low harvest of king salmon in 2020 and 2021, no ages were estimated to apply to the expanded harvest. In each of those years, only 1 Chinook salmon was sampled for age composition.

Sport fishing effort, measured in hours fished, on the Situk River varied across study years, with no clear increasing or decreasing trend. However, in 2020, sport fishing effort dropped considerably. This is most likely due to the effects of the Covid-19 pandemic on travel and the fact that the city and borough of Yakutat restricted travel of nonresidents for a period of approximately 2 months in early spring and summer of 2020. In 2021, even though the Covid-19 pandemic continued and the project was limited to a single sampler, effort rebounded considerably and even approached normal levels prior to 2020. This study continues to show the majority of fishing effort spent on the Situk River is by nonresident, unguided anglers who primarily access the fishery by foot. 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, such as an abundance of lodging and car rental businesses, that makes self-guided 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 would be useful to management and guide future creel survey design.

Total estimated sockeye salmon harvest also varied over study years. In 2018 only 194 sockeye salmon were harvested above the weir during the study period, whereas in 2021 the number harvested above the weir was 3,417. The dramatic difference was due to restrictions being implemented in 2018 for sockeye salmon because of low numbers passing the weir. In the end, the escapement goal in 2018 wasn't achieved and the fishery was closed midseason. Conversely, in 2021, the Situk River saw its highest count of sockeye salmon on record, when over 119,000 fish passed the weir.

Most participants in the Situk River sport fishery are unguided, nonresident anglers that access the fishery on foot. Drift boats are the second most common type of access, with motorboats and jet boats utilized by a fairly small proportion of anglers. 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 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 biological escapement goal for Chinook salmon on the Situk River. This objective remains important despite very low Chinook salmon harvest levels due to management restrictions; however, this study would benefit from broadening its scope to more fully assess sockeye salmon. Current study objectives and methodology do not estimate all sockeye salmon harvest, so above-weir harvest cannot be subtracted from weir counts to estimate inseason sockeye salmon escapement on the Situk River. Recent below-average returns of sockeye salmon to the Situk River highlight the need for managers to be able to incorporate sockeye sport fish harvest into inseason escapement monitoring. Investigating a correlation of sockeye salmon harvests between this project and the ADF&G statewide harvest survey would help to expand estimates to project escapement in 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 ongoing conservation concerns for 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 two-sampler survey design at the Lower Landing, Nine Mile Bridge, and Maggie John Trailheads, 9 June to 31 July.

Location[a]	TOD stratum	Sampling hours	Total number of days	Sampling method for days[b]	Days sampled
LL	Mid-day	1000 – 1630	53	SYS	19
	Late-day	1630 – 2300	53	SYS	18
MJT	Mid-day	1000 – 1630	53	SYS	9
	Late-day	1630 – 2300	53	SYS	9
NMB	Mid-day	1000 – 1630	53	SYS	9
	Late-day	1630 – 2300	53	SYS	9

[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 2021.

	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	0
2020	9,891	946	8,704	1,187	1,321	8,570	7,867	596	40	1,367	0
2021[e]	12,228	816	11,807	421	5,174	7,054	6,200	790	332	4,906	0

Note: Effort by conveyance was recorded for all study years except 2018, when 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 3.–Expanded estimates of Chinook salmon harvest above and below the Situk River weir, and Chinook salmon catch from the entire river from 2018 through 2021.

	Large Chinook (≥28″)				Small Chinook (20–<28″)				Jack Chinook (≤20″)				Entire river	
Year	Above weir	SE	Below weir	SE	Above weir	SE	Below weir	SE	Above weir	SE	Below weir	SE	Catch	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	3	0	0	0	0	0	0	0	0	149	43

[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	Catch	SE	Harvest	SE	Harvest	SE	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

[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.

			Harvest by residency		Harvest by angler type		Harvest by conveyance				
Year	Total harvest	SE	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

Note: Effort by conveyance was recorded for all study years except 2018, when 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 during the period from 9 June to 31 July, from 2018 to 2021.

	Resident anglers		Nonresident anglers		
Year	Proportion	SE	Proportion	SE	Sample size
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

[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 during the period from 9 June to 31 July, from 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

[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 conveyance or access used by anglers participating in the Situk River sport fishery during the period from 9 June to 31 July, from 2018 to 2021.

	Foot		Drift boat		Motorboat		Jet boat		
Year	Proportion	SE	Proportion	SE	Proportion	SE	Proportion	SE	Sample 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

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

FIGURES

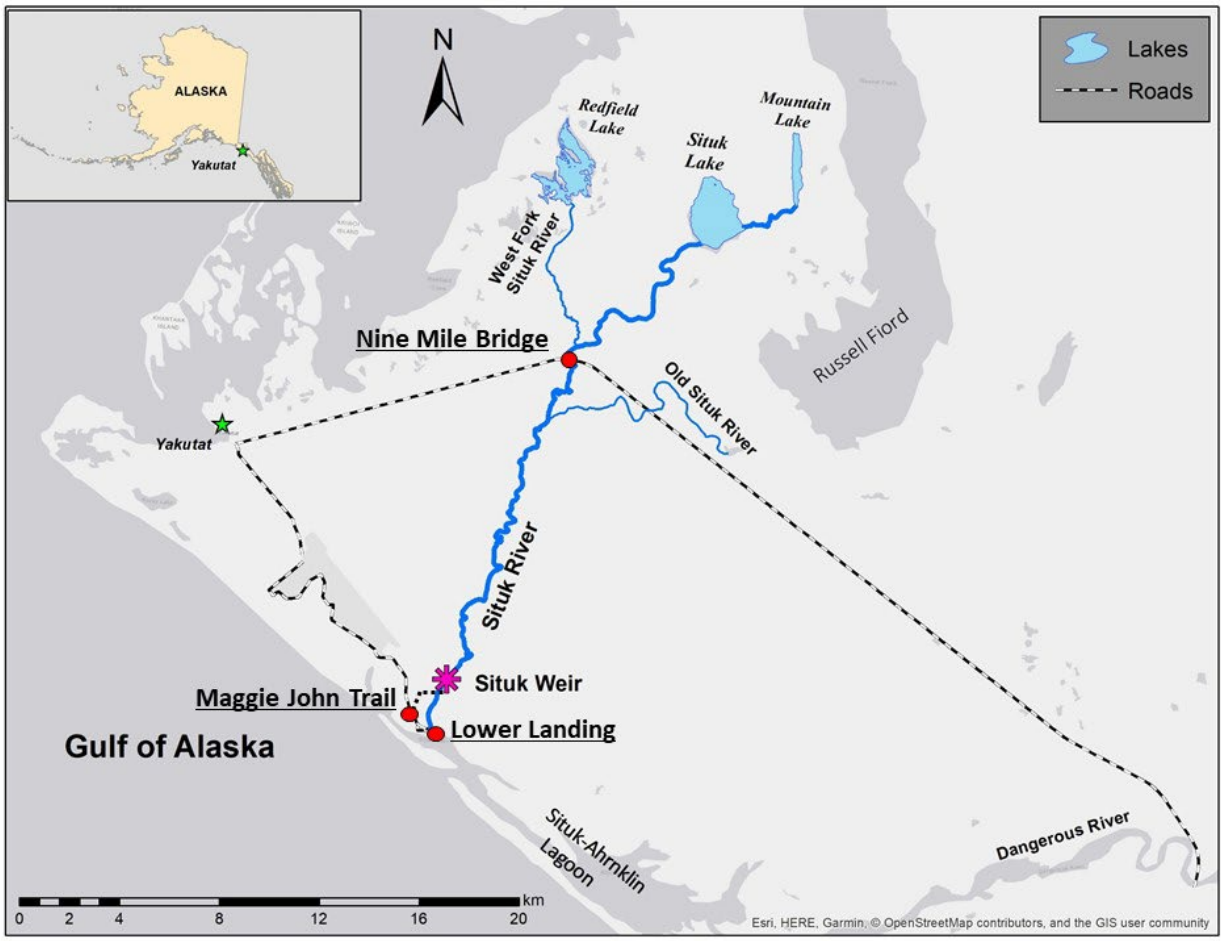

Figure 1.–Map of the Situk River drainage and location of the Situk weir and the 3 access sites of the Situk River creel survey, near Yakutat in Southeast Alaska.

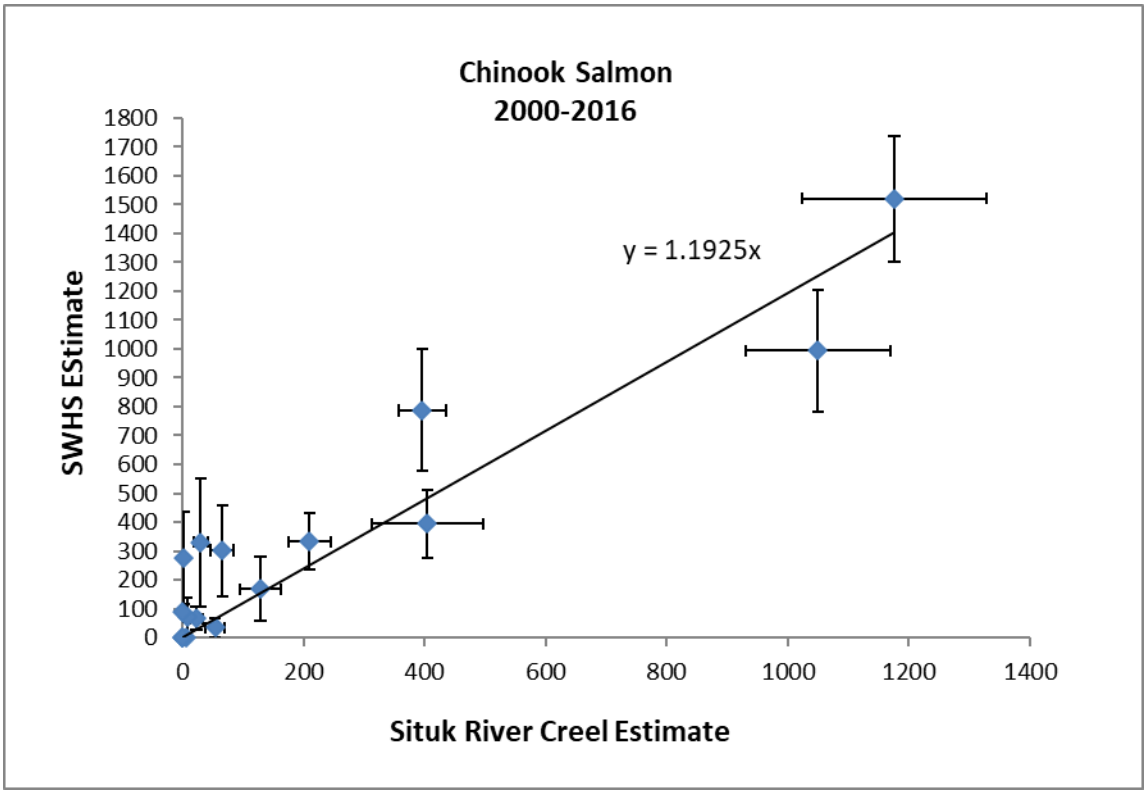

Figure 2.–Situk River Creel survey harvest estimates versus Statewide Harvest Survey estimates for Chinook salmon (all sizes), for both above and below the weir, 2000–2016.