

Fishery Data Series No. 01-13

**Situk River Chinook and Sockeye Salmon Sport
Harvest Estimates, and Yakutat Marine Sport Harvest
Sampling, 1998 and 1999**

by

Robert E. Johnson

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Alaska Department of Fish and Game

Division of Sport Fish



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Weights and measures (metric)		General		Mathematics, statistics, fisheries
centimeter	cm	All commonly accepted abbreviations.	e.g., Mr., Mrs., a.m., p.m., etc.	alternate hypothesis H_A
deciliter	dL	All commonly accepted professional titles.	e.g., Dr., Ph.D., R.N., etc.	base of natural logarithm e
gram	g	and	&	catch per unit effort CPUE
hectare	ha	at	@	coefficient of variation CV
kilogram	kg	Compass directions:		common test statistics F, t, χ^2 , etc.
kilometer	km	east	E	confidence interval C.I.
liter	L	north	N	correlation coefficient R (multiple)
meter	m	south	S	correlation coefficient r (simple)
metric ton	mt	west	W	covariance cov
milliliter	ml	Copyright	©	degree (angular or temperature) °
millimeter	mm	Corporate suffixes:		degrees of freedom df
Weights and measures (English)		Company	Co.	divided by \div or / (in equations)
cubic feet per second	ft ³ /s	Corporation	Corp.	equals =
foot	ft	Incorporated	Inc.	expected value E
gallon	gal	Limited	Ltd.	fork length FL
inch	in	et alii (and other people)	et al.	greater than >
mile	mi	et cetera (and so forth)	etc.	greater than or equal to \geq
ounce	oz	exempli gratia (for example)	e.g.,	harvest per unit effort HPUE
pound	lb	id est (that is)	i.e.,	less than <
quart	qt	latitude or longitude	lat. or long.	less than or equal to \leq
yard	yd	monetary symbols (U.S.)	\$, ¢	logarithm (natural) ln
Spell out acre and ton.		months (tables and figures): first three letters	Jan, ..., Dec	logarithm (base 10) log
Time and temperature		number (before a number)	# (e.g., #10)	logarithm (specify base) \log_2 , etc.
day	d	pounds (after a number)	# (e.g., 10#)	mid-eye-to-fork MEF
degrees Celsius	°C	registered trademark	®	minute (angular) '
degrees Fahrenheit	°F	trademark	™	multiplied by \times
hour (spell out for 24-hour clock)	h	United States (adjective)	U.S.	not significant NS
minute	min	United States of America (noun)	USA	null hypothesis H_0
second	s	U.S. state and District of Columbia abbreviations	use two-letter abbreviations (e.g., AK, DC)	percent %
Spell out year, month, and week.				probability P
Physics and chemistry				probability of a type I error (rejection of the null hypothesis when true) α
all atomic symbols				probability of a type II error (acceptance of the null hypothesis when false) β
alternating current	AC			second (angular) "
ampere	A			standard deviation SD
calorie	cal			standard error SE
direct current	DC			standard length SL
hertz	Hz			total length TL
horsepower	hp			variance Var
hydrogen ion activity	pH			
parts per million	ppm			
parts per thousand	ppt, ‰			
volts	V			
watts	W			

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ESTIMATES, AND YAKUTAT MARINE SPORT HARVEST SAMPLING,
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Division of Sport Fish
Anchorage, Alaska

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Robert E. Johnson
Alaska Department of Fish and Game, Division of Sport Fish, Region I
P. O. Box 49, Yakutat, AK 99689-0049, USA

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ABSTRACT

Angler effort and sport harvests of chinook salmon *Oncorhynchus tshawytscha* and sockeye salmon *Oncorhynchus nerka* were estimated at the Situk River near Yakutat from 8 June to 26 July 1998 and from 12 June to 30 July 1999. In 1998, an estimated 18,839 (SE = 1,875) angler-hours were expended to harvest 807 (SE = 167) large chinook salmon at least 16 inches (41 cm) in total length, 543 (SE = 105) small chinook salmon (<16 inches in length), and 5,289 (SE = 703) sockeye salmon. In 1999, an estimated 19,820 (SE = 1,917) angler-hours were expended to harvest 1,046 (SE = 155) large chinook salmon at least 28 inches (71 cm) in total length, 299 (SE = 71) small chinook salmon (<28 inches in length), and 6,393 (SE = 756) sockeye salmon. Most of the chinook salmon sampled from the Situk River were age 0.2 or 0.3.

Marine sport harvests of important finfish species were sampled at the Yakutat Small Boat Harbor during 1998 and 1999. Coded wire tag sampling indicated that relatively few (<5%) coho salmon *Oncorhynchus kisutch* were of hatchery origin. Because of small sample sizes, the estimated percentage of hatchery origin chinook salmon varied from 46% (SE = 46%) in 1998, based on only one tag recovery, to 3% (SE = 1%) in 1999, with seven tag recoveries. The estimated average net weight of Pacific halibut *Hippoglossus stenolepis* sampled was 35 lb in 1998 and 41 lb in 1999, well above average for Alaska sport fisheries. Lingcod *Ophiodon elongatus* round weight was also well above average at 23 lb in 1998 and 24 lb in 1999.

Key words: Creel survey, angler effort and harvest, sport fishery, hatchery, CWT, coded wire tag, chinook salmon, sockeye salmon, coho salmon, Pacific halibut, lingcod, Situk River, Yakutat, Southeast Alaska.

INTRODUCTION

Sport fisheries in marine and fresh waters near Yakutat, Alaska offer outstanding fishing opportunities for both residents and tourists visiting the area. The Yakutat sport fishing area includes those areas drained by streams entering, and including the Gulf of Alaska between Cape Suckling and Cape Fairweather. Angler harvests for the Yakutat area are estimated through use of Statewide Harvest Survey (SWHS) questionnaires mailed annually to a sample of sport anglers who purchased sport fishing licenses in Alaska (Howe et al. 2001c).

During 1999, anglers spent an estimated 6,661 angler-days of saltwater fishing participation in the Yakutat area, and an estimated 16,746 angler-days of participation in Situk River fisheries (Howe et al. 2001c). This effort represents only 2% of the total marine participation (435,379 angler-days) in Southeast Alaska during 1999, but 27% of the total freshwater participation. Most marine angling effort for chinook salmon *Oncorhynchus tshawytscha*, coho salmon *O. kisutch*, and Pacific halibut *Hippoglossus stenolepis* in this area occurs within a 20 mile radius of Yakutat.

Yakutat sport fisheries, especially those for marine salmon and bottomfish, experienced a rapid period of growth during the mid-1990's. Yakutat marine angling effort more than doubled from 2,494 angler-days during 1988 (Mills 1989) to 5,352 angler-days during 1996 (Howe et al. 2001a). The Yakutat area sport harvest of Pacific halibut and lingcod *Ophiodon elongatus* increased from 777 in 1986 (Mills 1987) and 160 in 1991 (Mills 1992), to 5,166 and 1,029, respectively, during 1998 (Howe et al. 2001b).

Given the increases in marine harvests of both salmon and bottomfish species in the Yakutat area, sampling was initiated in 1998 to gather information regarding stock, age, or size composition. Similar sampling of other important sport fisheries in Southeast Alaska has been conducted for a number of years (Hubartt et al. 1999). Biological information gathered from sport harvests of chinook salmon is used by ADF&G to manage for quotas set by the Pacific Salmon Treaty as well as to determine distribution and exploitation of both wild and hatchery stocks. Similarly, coho salmon management is tied to coded wire tag (CWT) sampling of both wild and hatchery indicator stocks. Pacific halibut length data are used to estimate weight of the sport harvest for use

by the International Pacific Halibut Commission (IPHC) in determining total removals of this species. Lingcod length data are also used to determine total weight of the sport harvest as conservation concerns are prompting more intensive management of this species.

During 1998 and 1999 at the Yakutat Small Boat Harbor, marine sport harvested chinook and coho salmon were sampled for CWT data, and Pacific halibut and lingcod were sampled for length data. The boat harbor survey of sport harvest was conducted from 13 April to 27 September 1998 and 12 April to 19 September 1999.

The majority of freshwater angling effort for chinook and sockeye salmon in the Yakutat area occurs within the Situk River, located approximately 10 miles east of Yakutat (Figure 1). The Situk River sport fishery targets chinook and sockeye salmon from June through July. The estimated sport harvest of Situk River chinook salmon increased from 161 during 1986 (Mills 1987) to 2,812 in 1996 (Howe et al. 2001a). Similarly, estimated sport harvests of Situk River sockeye salmon increased from 544 in 1986 to 5,803 during 1996.

Situk River chinook salmon harvest and age data are useful for harvest management and cohort analyses. A Situk River Management Plan for chinook salmon is dependent upon closely monitoring harvests inseason to ensure escapement goals (which are linked to counts at a weir) are achieved. A creel survey at the primary exit location for anglers on the Situk River was conducted from 8 June through 26 July 1998 and 12 June through 30 July 1999 to document angler effort and harvest of chinook and sockeye salmon above and below the Situk River weir.

I also wished to compare estimates from the SWHS and creel surveys to determine if significant differences existed between them. Given that personnel were already committed to inseason monitoring, this check would help confirm validity of both survey methodologies.

Residency and transportation statistics were also gathered during the Situk River harvest survey to provide angler use data for assistance in development of the Situk River Cooperative Planning Strategy. This cooperative management strategy is being developed with the State of

Alaska, City and Borough of Yakutat, Yakutat Tlingit Tribe, and the United States Forest Service (USFS) as partners to address future management decisions affecting activities within the Situk River corridor. One of the immediate needs for this process was the collection of information to describe current use patterns of Situk River anglers.

OBJECTIVES

SITUK RIVER CREEL SURVEY

One objective of the 1998 and 1999 Situk River creel surveys was to estimate the total angler effort, catch and harvest of chinook salmon in the Situk River beginning from the first week of June through the month of July, such that the total harvest estimate was within $\pm 25\%$ of the true value 95% of the time. Another objective was to estimate the age composition of the chinook salmon harvested by the recreational fishery in the Situk River during those years, such that estimated composition was within ± 7.5 percentage points of the true value 95% of the time.

Additionally, estimates of catch and harvest of chinook salmon were separated into two size classes (large and small) and two locations (above and below the ADF&G fish-counting weir).

YAKUTAT MARINE SPORT HARVEST SAMPLING

The relative contribution of Alaska hatchery coho salmon by coded wire tag lot to the marine fishery in Yakutat from 13 April through 27 September 1998, and 12 April to 19 September 1999, was to be estimated within ± 15 percentage points of the true value 95% of the time. While no objective criteria were set for the estimation of the relative contribution of chinook salmon from Alaskan hatcheries, an occasional tagged chinook salmon from these hatchery releases was expected. An associated task was to estimate the age composition and mean length-at-age of chinook salmon harvested in the Yakutat marine boat sport fishery during the periods surveyed.

Another task was to estimate the average weight of Pacific halibut and lingcod taken in the

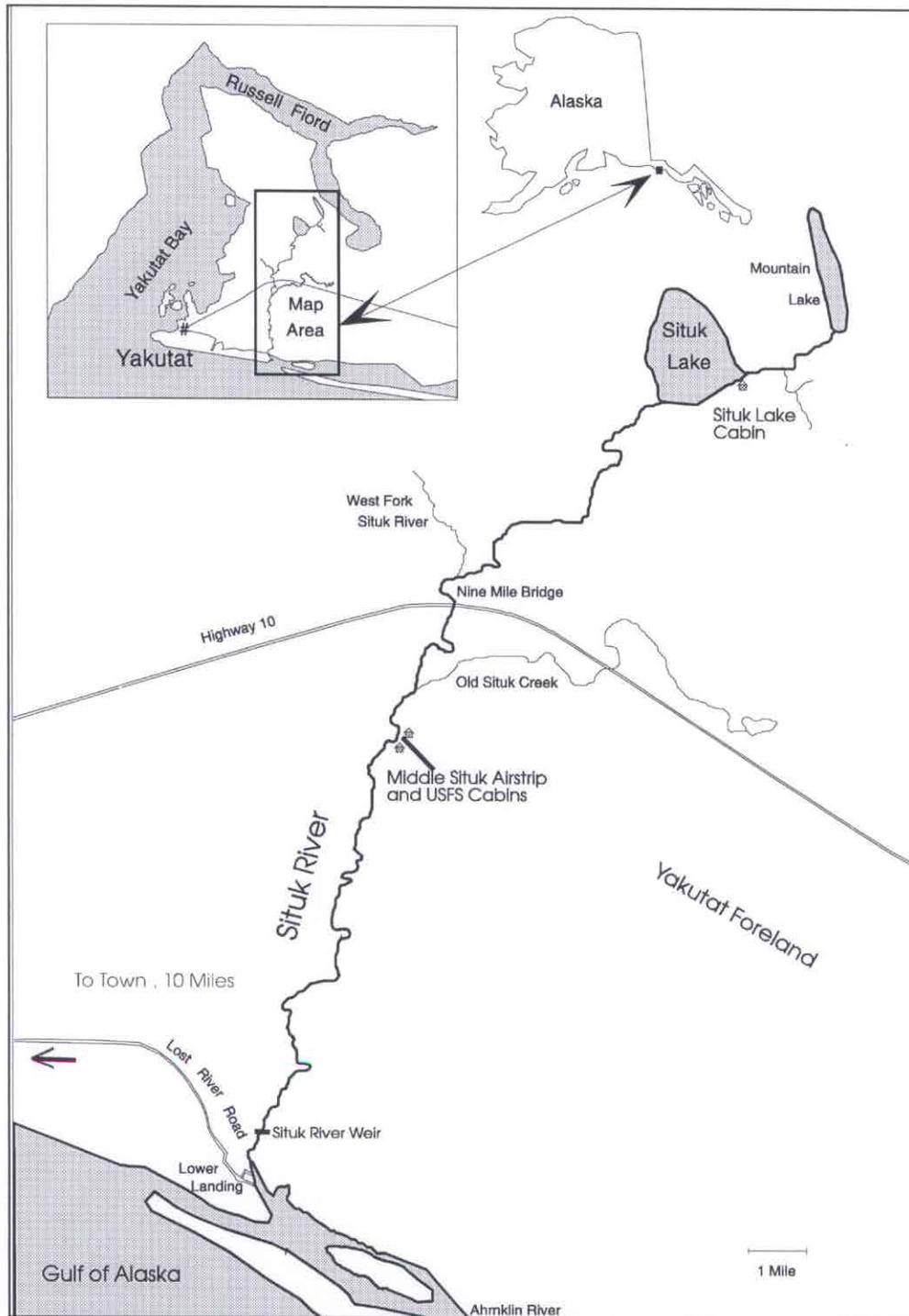


Figure 1.—General location of the Yakutat marine fishery in Yakutat Bay (inset) and the Situk River drainage (main map). The Lower Landing interview site and access location near the mouth of the Situk River at lower left is also shown.

Yakutat marine sport fishery. In 1999, an additional task was to estimate average weights of fish taken both by charter and non-charter anglers.

REGULATIONS

SITUK RIVER

The sport and commercial fisheries for chinook salmon in the Situk River are governed by a management plan to meet an escapement goal of 450 to 750 large chinook salmon. After several weeks of monitoring inseason escapement during 1998, managers determined that the chinook salmon escapement goal would be met and set the sport bag and possession limit at 2 fish 16 inches (41 cm) or more in total length. An additional 10 chinook salmon <16 inches in length could also be taken. There was an annual limit of 4 chinook salmon, 28 inches (71 cm) or more in length, for nonresidents. In order to harvest the chinook salmon surplus above the escapement goal while providing protection for upstream resident rainbow trout *Oncorhynchus mykiss* stocks, use of bait was allowed downstream from the Middle Situk Airstrip from 10 July through 15 August, when coho salmon were expected to begin returning.

During 1999, Situk River returns also allowed a sport bag limit of 2 chinook salmon, 16 inches or more in total length, per day and in possession with an additional 10 under 16 inches. There again was an annual limit of 4 chinook salmon, 28 inches or more in length, for nonresidents. The use of bait was allowed downstream of the Middle Situk Airstrip beginning on 28 June and extending until 15 August.

In 1998, the bag limit for sockeye salmon in the Situk River was 6 fish per day and 12 in possession until low weir counts resulted in issuance of an Emergency Order requiring sport anglers to immediately release all sockeye salmon beginning on 4 July. Following this restriction, weir counts for sockeye salmon increased substantially, and the department projected a seasonal escapement of greater than 45,000 sockeye in the Situk River. This number of fish is near the middle of the escapement goal range. Therefore, the sport fishery for sockeye salmon in the Situk River drainage was subsequently opened

to 2 fish per day and 4 fish in possession from 10 July through 15 August, 1998.

During 1999, sport regulations for sockeye salmon in the Situk River allowed 6 fish per day and 12 in possession.

YAKUTAT MARINE WATERS

Regulations for chinook salmon in marine waters were changed inseason to meet total harvest allocations set under the Southeast Alaska Chinook Salmon Management Plan. Sport anglers were limited to 2 chinook salmon per day, 2 in possession with a minimum total length of 28 inches from 1 January through 2 July 1998 and 1 January through 2 July 1999. In 1998, the bag and possession limit was increased to 3 from 3 July through 8 September and then reduced to 1 from 9 September through 31 December. In 1999, the chinook bag limit was reduced to 1 per day and in possession from 3 July through 31 December. There was an annual limit of 4 chinook salmon for nonresidents in both 1998 and 1999, and charter vessel operators and crew members were also prohibited from retaining chinook salmon while clients were on board.

The marine bag limit for coho salmon was 6 per day, 12 in possession, while the Pacific halibut bag limit was 2 per day, 4 in possession. The bag limit for lingcod was 2 per day, 4 in possession during the open season from 1 May through 30 November.

METHODS

SITUK RIVER CREEL SURVEY

Harvest and Effort Estimates

A two-stage survey was conducted from 8 June to 26 July 1998 and from 12 June to 30 July 1999 to estimate Situk River sport effort and harvest of chinook and sockeye salmon. Residency and transportation data were also collected at the time of interview and allowed for class specific estimates of effort and harvest. In 1998, chinook salmon were classified as either large (≥ 16 inches TL) or small (<16 inches TL). In 1999, the large and small classifications were changed to ≥ 28 inches TL and <28 inches TL, respectively, to conform with regional size

standards for adult and jack chinook salmon. Harvests of chinook salmon were also estimated by location (above and below a weir located about 1.5 miles upstream) so that escapements above the weir could be better estimated for stock-recruitment analysis.

One sampler was stationed at the Situk River Lower Landing (Figure 1) to interview anglers completing fishing trips. This is the primary exit point from the river for anglers floating downstream from the Nine-mile Bridge about 13.5 miles upstream, and many anglers also fish this area on foot or from boats launched here. Although there were several exit sites at the lower river, including a new trailhead located several hundred yards up the road from the river during 1999, the technician took great care to intercept and interview all exiting anglers. A few anglers also fish the river from two USFS cabins located upstream as well as near the Nine-mile Bridge. Personal observations indicated that a relatively small proportion of the sockeye and chinook fishing effort exits from the Nine-mile Bridge.

Time of day (TOD) stratification was used in both 1998 and 1999. In 1998, 3 TOD strata were used: early-day (0600 to 1200 hours), mid-day (1200 to 1800 hours), and late-day (1800 to 2400 hours). Since so few anglers were encountered in the early-day TOD stratum in 1998, only 2 TOD strata were used in 1999: mid-day (1100 to 1730 hours) and late-day (1730 to 2400 hours). It was thought that by adjusting the mid-day stratum to start an hour earlier, nearly all of the fishery would still be monitored. Each of these TOD strata ("days") were sampled in their entirety on a systematic basis. In 1998, the late-day stratum was sampled every 3rd day and the early-day and mid-day strata were sampled every 6th day. In 1999, the 7 early-day samples were reassigned to the mid-day (4 samples) and late-day (3 samples) strata.

Estimates of angler effort, and catch and harvest of chinook and sockeye salmon for each stratum were obtained by the procedures appropriate to a stratified two-stage sample survey with "days" (sampled systematically) as first stage sampling units and anglers as second stage sampling units. Point estimates were calculated as outlined in Bernard et al. (1998, Table 2.1, equation 2.1).

Variances were then calculated using equation 2.5 from Bernard et al. (1998, Table 2.4), in which the systematically selected first stage sampling unit version of the estimation equations were used. This approach to obtaining estimates of catch and harvest above and below the weir is similar to treating the "above" and "below" weir fish as different species.

Scale Sampling for Age Determination

Four scales were sampled near the preferred area on each chinook salmon, at a point on a diagonal line from the posterior insertion of the dorsal fin to the anterior insertion of the anal fin, two rows above the lateral line (Welander 1940). If the scales in the preferred location could not be obtained, another set of scales was taken from as close to the preferred scale area as possible. However, scales were only taken from the area bounded dorsally by the fourth row of scales above the lateral line, ventrally by the lateral line, and between lines drawn vertically from the posterior insertion of the dorsal fin and the anterior insertion of the anal fin. If no scales were available in the preferred area on the left side of the fish, scales were collected from the preferred area on the right side of the fish. Scales were then mounted on gum cards, and impressions made in cellulose acetates (Clutter and Whitesel 1956). The scales were then aged using procedures from Olsen (1995). Mid-eye to fork of tail (MEF) lengths in millimeters of sampled chinook salmon were also recorded, and sex was determined when possible.

YAKUTAT MARINE SPORT HARVEST SAMPLING

Sampling of Salmon Harvests

One technician sampled fish harvested by anglers returning to both the docks and boat ramp at the Yakutat small boat harbor and the dock located immediately adjacent to the harbor which services a lodge and private boat moorings. Data collected from each boat-party exiting the Yakutat marine sport fishery included the number of chinook and coho salmon checked for adipose finclips. Heads from adipose finclipped fish were collected and identified with a uniquely numbered cinch strap. Cinch-strapped heads collected from adipose

finclipped chinook and coho salmon along with CWT Recovery Sampling forms were shipped to the ADF&G Tag Lab in Juneau where any tags present were removed and decoded. The tag recovery information from each head was then entered into the tag lab database. In conjunction with tag lab personnel, the numbers of fish sampled for adipose finclips were also entered into a related database so that hatchery contribution estimates could be generated directly.

Scale samples were also taken from chinook salmon for age analysis using methods described above for Situk River chinook salmon. Fork lengths of the chinook salmon were measured, but usually sex could not be determined.

Relative Contribution Estimates

Relative contributions by coded wire tag code for hatchery (or tagged wild-stock) fish in the Yakutat marine fishery were estimated by utilizing the approach outlined in Bernard and Clark (1996). Details of the methodology used for analysis of both hatchery and wild stock recoveries are provided in Hubartt et al. (1999, see Appendix A4).

Unbiased estimates of contributions will be obtained only if the total harvest of chinook salmon is sampled proportionally throughout the season or the contributions do not vary within the season. The sampling design used should have ensured approximately proportional sampling throughout the season.

Pacific Halibut Mean Weight Estimates

Since it was not practical or possible to weigh the harvested Pacific halibut, the IPHC length-weight relationship (Clark 1992) was employed to estimate the mean net weight and round weight of all measured Pacific halibut. Mean net and round weight of the harvest were estimated for both guided and non-guided anglers (as well as all anglers) as the mean of the predicted weights of all n sampled fish from each group (Nielsen and Schoch 1980):

$$\bar{w} = \frac{\sum_{i=1}^n aL_i^b}{n} \quad (1)$$

where L_i = the observed length (cm) of the i^{th} fish, $a = 6.921 \times 10^{-6}$ for net weight in pounds and 9.205×10^{-6} for round weight in pounds, and $b = 3.24$ (Clark 1992). Variances of the mean predicted weights were estimated using standard normal procedures but should be considered minimum estimates because variation inherent in the length-weight relationship was not incorporated. Mean weight estimates for Pacific halibut are presented in pounds because that is the standard unit used by Pacific halibut management agencies.

Lingcod Mean Weight Estimates

Estimates of the mean round weight of lingcod harvested in Yakutat were calculated as the mean of the predicted weights of all n sampled fish as for Pacific halibut in equation 1 above where L_i = the observed length (cm) of the i^{th} lingcod, $a = 7.9 \times 10^{-6}$ for round weight in kilograms, and $b = 3.07$. The constants a and b are those used by the Commercial Fisheries Division (D. Carlisle, ADF&G, Juneau, personal communication) for converting lingcod lengths to weights. Weights in kilograms were then converted to pounds by multiplying by 2.2046. Variances of the mean predicted weights were estimated by using standard procedures but should be considered minimum estimates because variation inherent in the length-weight relationship is not incorporated.

RESULTS

SITUK RIVER CREEL SURVEY

Effort and Harvest

Effort for chinook and sockeye salmon in the Situk River totaled 18,839 (SE = 1,875) and 19,820 (SE = 1,917) angler-hours during 1998 and 1999, respectively (Table 1). Angler-days of effort increased from 2,516 (SE = 238) in 1998 to 3,913 (SE = 352) in 1999.

Class specific estimates of angler-days of effort showed that non-residents accounted for 93%, and 94% of the effort in 1998 and 1999, respectively (Table 1). A breakdown of transportation used by anglers finishing their fishing trips during 1998 estimated that 25% (SE = 4%) of the angler-days

Table 1.—Summary of estimated angler-hours and angler-days of effort by angler type or by transportation type at the Situk River Lower Landing fishery during 8 June to 26 July 1998 and 12 June to 30 July 1999.

Angler or transportation type	8 June to 26 July 1998				12 June to 30 July 1999			
	Angler-hours		Angler-days		Angler-hours		Angler-days	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
All anglers	18,839	1,875	2,516	238	19,820	1,917	3,913	352
Resident anglers	1,399	252	183	28	667	108	194	29
Nonresident anglers	17,439	1,785	2,333	225	19,000	1,878	3,670	341
Guided anglers	5,450	751	646	96	4,635	533	813	91
Unguided anglers	13,388	1,558	1,870	212	15,170	1,677	3,097	311
Jet boats	2,138	684	262	86	1,135	240	194	38
Non-jet motor boats	3,007	671	419	105	3,653	460	714	82
Unpowered boats	5,606	962	623	124	3,663	556	727	103
On foot	8,088	1,260	1,211	176	11,368	1,302	2,277	245

fished were from unpowered boats, 17% (SE = 4%) from motorized (non-jet) boats, 10% (SE = 3%) from jet boats, and 48% (SE = 5%) from accessing the river by foot. During 1999, 19% (SE = 3%) of angler-days were from unpowered boats, 18% (SE = 2%) from motorized (non-jet) boats, 5% (SE = 1%) from jet boats, and 58% (SE = 3%) from accessing the river by foot.

An estimated 807 (SE = 167) large chinook salmon at least 16 inches in length, and 5,289 (SE = 703) sockeye salmon were harvested from the Situk River during 1998 (Table 2). Of these, 415 (SE = 97) large chinook and 1,297 (SE = 217) sockeye salmon were harvested above the Situk River weir. During 1999, 1,046 (SE = 155) large chinook salmon at least 28 inches in length, and 6,393 sockeye were harvested from the Situk River. Of these, 553 (SE = 115) large chinook and 813 (SE = 170) sockeye were harvested above the Situk River weir. Additionally, 543 (SE = 105) small chinook salmon <16 inches in length were harvested in 1998, and 299 (SE = 71) small chinook salmon <28 inches in length were harvested during 1999.

Class-specific estimates of harvest showed that nonresidents accounted for more than 90% of the

chinook and sockeye salmon harvested at the site in both 1998 and 1999 (Table 2).

Detailed sampling information, including angler counts and numbers of completed interviews for overall estimates by sampling period, is presented in Appendices A1 and A2, for 1998 and 1999, respectively.

Chinook Salmon Age Data

Scale samples from 194 and 304 chinook salmon taken in 1998 and 1999, respectively, during the Situk creel survey were aged (Tables 3 and 4). The sex of relatively few (28 in 1998, 94 in 1999) chinook salmon were determined during the survey, so age class classifications by sex were poorly estimated. For both sexes combined, age 0.3 was the dominant age class in both years: 48% (SE = 4%) in 1998 and 62% (SE = 3%) in 1999.

YAKUTAT MARINE SPORT HARVEST SAMPLING

Sampling Effort

During 1998, 1,800 marine anglers were interviewed at the Yakutat Small Boat Harbor, and

Table 2.—Summary of estimated total catch and harvest of salmon by location, angler type and/or transportation type at the Situk River Lower Landing fishery during 8 June to 26 July 1998 and 12 June to 30 July 1999.

Location of harvest	Angler or transportation Type	Salmon species	8 June to 26 July 1998				12 June to 30 July 1999			
			Total catch		Harvest		Total catch		Harvest	
			Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Above and below weir	All anglers	All chinook	1,732	301	1,351	227	1,815	269	1,345	195
	All anglers	Large chinook ^a	1,013	226	807	167	1,415	212	1,046	155
	All anglers	Small chinook ^b	719	147	543	105	401	93	299	71
	All anglers	Sockeye	8,740	1,032	5,289	703	8,710	998	6,393	756
Above and below weir	Resident anglers	All chinook	233	75	178	67	128	34	84	23
	Nonresident anglers	All chinook	1,500	286	1,173	223	1,682	264	1,256	190
	Guided anglers	All chinook	936	176	667	135	997	157	764	121
	Unguided anglers	All chinook	796	173	683	141	818	162	581	115
	Jet boats	All chinook	460	175	366	137	352	88	255	61
	Non-jet motor boats	All chinook	130	72	70	28	448	90	306	62
	Unpowered boats	All chinook	642	174	508	144	457	78	360	57
	Anglers on foot	All chinook	500	188	406	120	558	131	423	102
	Resident anglers	Sockeye	371	105	285	88	400	139	192	55
	Nonresident anglers	Sockeye	8,369	1,013	5,004	677	8,293	1,001	6,183	757
	Guided anglers	Sockeye	1,495	260	1,025	188	1,466	231	1,172	194
	Unguided anglers	Sockeye	7,245	869	4,264	619	7,232	966	5,209	718
Above weir	All anglers	Large chinook ^a	521	137	415	97	742	150	553	115
		Small chinook ^b	173	63	101	33	242	49	187	46
		Sockeye	2,322	714	1,297	217	1,288	297	813	170
Below weir	All anglers	Large chinook ^a	492	180	392	108	673	97	493	71
		Small chinook ^b	546	144	442	103	159	58	112	36
		Sockeye	6,418	726	3,991	604	7,422	899	5,580	693

^a Large chinook salmon were those ≥ 16 inches in 1998 and ≥ 28 inches in 1999.

^b Small chinook salmon were those < 16 inches in 1998 and < 28 inches in 1999.

Table 3.—Estimated age composition of chinook salmon taken in the Situk River sport fishery, 1998.

SEX ^a		BROOD YEAR AND AGE CLASS							Total	R ^b	
		1996 0.1	1995 0.2	1994 0.3	1993 0.4	1995 1.1	1994 1.2	1993 1.3			
Female	n	0	3	6	4	0	1	0	14	3	
	%	0.0	21.4	42.9	28.6	0.0	7.1	0.0	50.0		
	SE of %	0.0	11.4	13.7	12.5	0.0	7.1	0.0	6.1		
	MEF length	0	653	763	873	0	700	0	747		741
	SD of length	0	63.4	40.3	39.7	0	0	0	47.8		70.1
	SE of length	0	36.6	16.4	19.8	0	0	0	24.3		40.4
	Harvest	0	145	290	193	0	48	0	676		
	SE of harvest	0	80	106	91	0	48	0	127		
Male	n	0	5	8	1	0	0	0	14	2	
	%	0.0	35.7	57.1	7.1	0.0	0.0	0.0	50.0		
	SE of %	0.0	13.3	13.7	7.1	0.0	0.0	0.0	6.1		
	MEF length	0	633	767	830	0	0	0	743		735
	SD of length	0	64.3	40.0	0	0	0	0	52.1		127.3
	SE of length	0	28.8	14.1	0	0	0	0	21.4		90.0
	Harvest	0	241	386	48	0	0	0	676		
	SE of harvest	0	42	70	0	0	0	0	127		
Sexes combined	n	10	51	93	28	2	8	2	194	37	
	%	5.2	26.3	47.9	14.4	1.0	4.1	1.0	100.0		
	SE of %	0.4	1.4	1.8	0.9	0.1	0.3	0.1	0.7		
	MEF length	335	639	767	833	295	660	730	608		705
	SD of length	27.0	81.5	49.3	54.9	7.1	62.2	127.3	58.5		130.4
	SE of length	8.5	11.4	5.1	10.4	5.0	22.0	90.0	21.8		21.4
	Harvest	70	355	648	195	14	56	14	1,351		
	SE of harvest	24	73	119	47	10	21	10	227		

^a Only 28 chinook salmon were sexed.

^b Scale samples from 37 chinook salmon were regenerated (R), and scales from 7 chinook salmon (mean = 749 mm, SE = 25 mm) were unreadable.

109 chinook salmon, 2,472 coho salmon, 683 lingcod, and 2,231 Pacific halibut were inspected. All chinook and coho salmon were sampled for presence or absence of a CWT. Length measurements were taken from 615 lingcod and 2,087 Pacific halibut.

During 1999, 2,474 marine anglers were interviewed at the Yakutat Small Boat Harbor and 153 chinook salmon, 3,588 coho salmon, 817 lingcod, and 2,406 Pacific halibut were inspected. All 153 chinook and 3,588 coho salmon were sampled for presence/absence of a CWT, and 242 lingcod and 863 Pacific halibut were measured.

Sampling information by week for the marine harvest sampling program is detailed in Appendices A3 and A4 for 1998 and 1999, respectively.

CWT Recoveries

In 1998, CWT sampling recovered 1 tagged chinook salmon and 5 tagged coho salmon. The single tagged chinook salmon recovered during 1998 originated from the Nitinat Hatchery in British Columbia and expanded to an imprecise estimate of 46% (SE = 46%) of the harvest (Table 5). The 5 tagged coho salmon recovered during

Table 4.—Estimated age composition of chinook salmon taken in the Situk River sport fishery, 1999.

		BROOD YEAR AND AGE CLASS							Total	R ^b	
		1997 0.1	1996 0.2	1995 0.3	1994 0.4	1995 1.2	1994 1.3	1993 1.4			
Female	n	0	2	8	1	0	0	1	12	8	
	%	0.0	16.7	66.7	8.3	0.0	0.0	8.3	17.4		
	SE of %	0.0	11.2	14.2	8.3	0.0	0.0	8.3	4.6		
	MEF length	0	660	774	870	0	0	710	758		811
	SD of length	0	14.1	46.6	0	0	0	0	68.4		61.7
	SE of length	0	10.0	16.5	0	0	0	0	19.7		21.8
	Harvest	0	39	156	19	0	0	19	234		
	SE of harvest	0	28	56	19	0	0	19	70		
Male	n	13	27	13	1	1	0	2	57	17	
	%	22.8	47.4	22.8	1.8	1.8	0.0	3.5	82.6		
	SE of %	5.6	6.7	5.6	1.8	1.8	0.0	2.5	4.6		
	MEF length	333	560	760	730	390	0	770	561		597
	SD of length	25.3	77.2	78.6	0	0	0	14.1	167.6		155.9
	SE of length	7	14.9	21.8	0	0	0	10.0	22.2		37.8
	Harvest	253	526	253	19	19	0	39	1,111		
	SE of harvest	73	110	73	19	19	0	28	172		
Sexes combined	n	18	55	187	33	1	5	5	304	112	
	%	5.9	18.1	61.5	10.9	0.3	1.6	1.6	100		
	SE of %	1.4	2.2	2.8	1.8	0.3	1.6	1.6	0.0		
	MEF length	331	587	776	835	390	778	770	721		717
	SD of length	26.7	75.5	52.0	57.4	0	28.6	40.0	138.5		139.8
	SE of length	6.3	10.2	3.8	10	0	12.8	17.9	7.9		13.2
	Harvest	80	243	827	146	4	22	22	1,345		
	SE of harvest	21	46	126	32	4	10	10	195		

^a Only 94 chinook salmon were sexed.

^b Scale samples from 112 chinook salmon were regenerated (R).

1998 included fish that originated from hatchery releases at Medveje, Nakat Inlet, and Gastineau facilities as well as a wild tagged coho salmon from Berners River north of Juneau. In aggregate, only about 1% of the 1998 coho harvest was of hatchery origin.

Seven chinook and 21 coho CWT recoveries occurred during 1999 sampling (Table 6). Relative contributions for hatchery produced chinook and coho salmon totaled 3% and 4% of the harvest, respectively. Tagged Alaska wild-stock coho salmon composed an estimated 3% of the harvest.

Chinook Salmon Age Data

Age 0.3 chinook salmon composed 61% of the harvested chinook during 1998, while about half (48%) were age 0.4 during 1999 (Tables 7 and 8). Overall, age 0. stocks composed about 85% of the chinook salmon harvested.

Mean Weights of Bottomfish

Summaries of Pacific halibut and lingcod sampling statistics for 1998 and 1999 are presented in Tables 9 and 10. The average length of Pacific halibut sampled during 1998 was 111.2 cm (SE = 0.6). The average net

Table 5.–Estimated contributions of hatchery-produced and wild-tagged stocks to 109 chinook salmon and 2,472 coho salmon sampled from the Yakutat marine sport fishery, 13 April–27 September 1998.

Region	Agency ^a	Hatchery/ release site	Tag code	Rec ^b	Con ^c	Variance ^d	Relative contribution
CHINOOK SALMON - HATCHERY STOCKS							
British Columbia	CDFO	Nitinat River	18-18-32	1	50	2,424	46% ^e
		B.C. total		1	50	2,424	46% ^e
Chinook hatchery total				1	50	2,424	46% ^e
COHO SALMON - HATCHERY STOCKS							
Alaska	NSRA	Medvejie	04-47-21	1	5	19	<0.5%
		Nakat Inlet	04-48-07	2	19	166	1%
	DIPC	Gastineau	50-04-16	1	10	86	<0.5%
		Alaska total		4	34	271	1%
Coho hatchery total				4	34	271	1%
COHO SALMON - WILD STOCKS^f							
Alaska	ADFG	Berners River	04-46-47	1	8	60	<0.5%
		Alaska total		1	8	60	<0.5%
Wild stock coded wire tagged coho total				1	8	60	<0.5%

^a CDFO = Canada Department of Fisheries and Oceans, SSRA = Southern Southeast Regional Aquaculture Association, NSRA = Northern Southeast Regional Aquaculture Association, ADFG = Alaska Department of Fish and Game.

^b Rec = Recovered number of fish of noted tag code from the sampled harvest.

^c Con = Contribution to the sampled harvest of the release of the noted tag code.

^d Variance = Variance of the estimated contribution of the release of the noted tag code.

^e Note that this estimate has very poor precision as the coefficient of variation is 98%.

^f Alaska wild stock contribution estimates were expanded by using tagging fractions estimated from the ratio of marked to total adults on the spawning grounds.

weight of Pacific halibut sampled during 1998 was 35 lbs. Sampled lingcod in 1998 averaged 97.2 cm (SE = 0.5) in length with an estimated weight of 23.4 lbs.

The average length of Pacific halibut sampled in 1999 was 113.6 cm (SE = 1.1). Sport-harvested Pacific halibut averaged 41 lb during 1999. Sampled lingcod averaged 96.7 cm (SE = 1.2) in length; estimated average weight was 24.2 lb. Average lengths and weights of both Pacific halibut and lingcod taken by guided anglers were substantially higher than those taken by unguided anglers.

DATA FILES

Appendix A5 contains a listing of the archived final data sets used during the analysis.

DISCUSSION

Harvests of both chinook salmon and sockeye salmon at the Lower Landing as estimated from the creel survey were considerably higher than when the last comparable on-site creel survey was conducted in 1988 (Suchanek et al. 1989), when 1,202 angler-days and 4,468 angler-hours were spent during roughly the same time period

Table 6.– Estimated contributions of hatchery-produced and wild-tagged stocks to 154 chinook salmon and 3,542 coho salmon sampled from the Yakutat marine sport fishery, 12 April–19 September 1999.

Region	Agency ^a	Hatchery/ release site	Tag code	Rec ^b	Con ^c	Variance ^d	Relative contribution	
CHINOOK SALMON - HATCHERY STOCKS								
Oregon	ODFW	McKenzie	07-10-46	1	1	0	1%	
		Oregon total		1	1	0	1%	
British Columbia	CDFO	Tofino PIP	18-22-51	2	2	0	1%	
		B.C. total		2	2	0	1%	
Alaska	ADFG	Elmendorf	31-25-11	1	2	4	1%	
		Alaska total		1	2	4	1%	
Chinook hatchery total				4	5	4	3%	
COHO SALMON - HATCHERY STOCKS								
Alaska	NSRA	Medvejie	04-47-08	1	6	29	<0.5%	
		Hidden Falls	04-49-09	1	34	1,126	1%	
	SSRA	Neets Bay	04-49-47	1	23	500	1%	
		Whitman Lake	04-49-48	1	13	156	<0.5%	
	DIPC	Gastineau	50-04-29	50-04-29	1	11	115	<0.5%
			50-04-30	50-04-30	1	11	117	<0.5%
			50-04-34	50-04-34	2	20	177	1%
			50-04-36	50-04-36	1	10	88	<0.5%
	Alaska total				9	128	2,308	4%
	Coho hatchery total				9	128	2,308	4%
COHO SALMON - WILD STOCKS ^e								
Alaska	ADFG	Hugh Smith Lake	04-43-48	1	1	1	0%	
		Taku River	04-46-42	1	62	3,735	2%	
		Berners River	04-45-30	3	21	133	1%	
			04-46-49	4	28	177	1%	
		Alaska total				9	112	4,046
Wild stock coded wire tagged coho total				9	112	4,046	3%	

^a ODFW = Oregon Department of Fish and Wildlife, CDFO = Canada Department of Fisheries and Oceans, ADFG = Alaska Department of Fish and Game, NSRA = Northern Southeast Regional Aquaculture Association, SSRA = Southern Southeast Regional Aquaculture Association.

^b Rec = Recovered number of fish of noted tag code from the sampled harvest.

^c Con = Contribution to the sampled harvest of the release of the noted tag code.

^d Variance = Variance of the estimated contribution of the release of the noted tag code.

^e Alaska wild stock contribution estimates were expanded by using tagging fractions estimated from the ratio of marked to total adults on the spawning grounds.

to catch 135 chinook salmon. This compares with the 1998–1999 averages of 3,214 angler-days, 19,329 angler-hours, and 1,773 chinook salmon.

Harvest estimates from the Situk River onsite surveys were compared with SWHS estimates for both chinook and sockeye salmon in 1998 and 1999 (Table 11). Because the creel survey

did not include harvests taken at the Nine-mile Bridge or at two USFS cabins, the creel survey estimates were expected to be negatively biased in comparison to the SWHS estimates (although the bias was believed to be small). The 95% confidence intervals for the SWHS estimates were obtained by bootstrapping.

Table 7.–Estimated age composition of chinook salmon taken in the Yakutat marine sport fishery, 1998.

		BROOD YEAR AND AGE CLASS						Total
		1995 0.2	1994 0.3	1993 0.4	1994 1.2	1993 1.3	1992 1.4	
Sample size	n	3	52	17	1	8	4	85
Percent of sample	Estimate	3.5	61.2	20.0	1.2	9.4	4.7	
	SE of %	2.0	5.3	4.4	1.2	3.2	2.3	
Mean FL (mm)	Estimate	762	846	897	761	852	890	
	SD	26.7	9.2	16.6	–	23.0	27.6	
	SE	2.9	1.0	1.8	–	2.5	3.0	

Table 8.–Estimated age composition of chinook salmon taken in the Yakutat marine sport fishery, 1999.

		BROOD YEAR AND AGE CLASS							Total
		1996 0.2	1995 0.3	1994 0.4	1993 0.5	1995 1.2	1994 1.3	1993 1.4	
Sample size	n	5	44	63	1	3	9	6	131
Percent of sample	Estimate	3.8	33.6	48.1	0.8	2.3	6.9	4.6	
	SE of %	1.7	4.1	4.4	0.8	1.3	2.2	1.8	
Mean FL (mm)	Estimate	749	800	861	878	791	818	852	
	SD	42.3	10.3	11.4	-	66.4	27.5	42.3	
	SE	3.7	0.9	1.0	-	5.8	2.4	3.7	

Estimates were considered to be different if confidence levels did not overlap (Table 11). The only difference between overall estimates was for the 1998 sockeye harvest (5,289 onsite, 9,448 mail-in). Perhaps anglers could not accurately recall the number of fish harvested and overestimated this statistic on their mail surveys. It is also possible that sockeye harvests at the Nine-mile Bridge were substantially higher than thought, although the amount of effort observed in that area does not seem to support that level of harvest. The number of anglers using the USFS cabins during sockeye season is also relatively small. In both 1998 and 1999, SWHS estimates of sockeye harvests above the weir were significantly higher than for the creel survey. This was in part due to harvests taken by anglers fishing near the Nine-mile bridge or at USFS cabins which were not covered by the creel survey, but the differences were larger than expected. Estimated sockeye harvests below the weir were not significantly different. It would

seem that the on-site survey would be more accurate since the harvest was directly observed from those anglers interviewed. All of the chinook estimates compared were not significantly different.

Few chinook salmon sampled from the Situk River were sexed due to the inability of the technician to determine sex of generally ocean-bright chinook salmon with any certainty. Thus, the combined Situk sample for each year gives the most useful indication of age class composition for each of the two years. The 1-ocean, and 4-ocean age classes are probably not represented proportionally in the harvest statistics due to low retention rates for the small jacks (1-ocean) and the general inability of anglers to land the largest (4-ocean) chinook salmon in such a small stream.

The finding that about 85% of the marine sport chinook harvest for both years was of the zero freshwater age component predominant in the

Table 9.–Pacific halibut average lengths and net weights for all anglers during 1998, and for guided, unguided and all anglers during 1999.

	1998	1999		
	All	Guided	Unguided	All
Sample size	2,078	762	101	863
Mean length (cm)	111.2	116.3	93.5	113.6
SD length	25.4	30.4	27.5	31.0
SE mean length	0.6	1.1	2.7	1.1
Mean net weight (lb)	35.4	43.2	22.5	40.8
SE mean weight	0.4	1.4	2.3	1.3

Table 10.–Lingcod average lengths and round weights for all anglers during 1998, and for guided, unguided and all anglers during 1999.

	1998	1999		
	All	Guided	Unguided	All
Sample size	615	206	39	245
Average length (cm)	97.2	102.2	67.6	96.7
SD length	13.4	12.9	21.7	19.3
SE mean length	0.5	0.9	3.5	1.2
Average round weight (lb)	23.4	27.0	9.7	24.2
SD weight	9.2	9.6	9.4	11.5
SE mean weight	0.4	0.7	1.5	0.7

Situk River suggests that local stocks play an important role in supporting the marine sport chinook fishery. Since many non-Alaskan chinook stocks are also of zero freshwater age, it is difficult to determine the contributions of the local freshwater stocks to the fishery. The CWT recoveries of both chinook and coho salmon show that a diverse mix of stocks is present in and around Yakutat Bay. Although the poorly

estimated chinook hatchery contribution of 46% in 1998 was due to only one tag recovery, the Nitinat hatchery was a very prolific contributor in Southeast Alaska during 1998 as it contributed about 31% of the Craig and 17% of the Sitka chinook sport harvests (Hubartt et al. 1999).

Yakutat average weights for Pacific halibut are impressive, weighing in at nearly double the average size of those landed by sport anglers in other ports in IPHC Area 3A (the North Gulf of Alaska, Prince William Sound, Cook Inlet, and Kodiak areas) during 1998 and 1999 (Meyer *In prep*). The great difference in the weights of both Pacific halibut and lingcod between guided and non-guided anglers in 1999 can probably be attributed to the difference in areas fished by the two groups of anglers. Guided anglers tend to fish on the far shore of Yakutat Bay and on the seaward edge of the reef across Yakutat Bay. Non-guided anglers generally fish much closer to town.

CONCLUSIONS AND RECOMMENDATIONS

The creel survey of Situk River chinook and sockeye salmon harvests should be continued to document increasing sport harvest of Situk River chinook and sockeye salmon in-season. This survey allows management of the Situk River under terms of the Situk River Chinook Management Plan, which also addresses management of the Situk River sockeye stock. Age composition data gathered also allows better analysis of stock-recruit relationships. Effort and harvest occurring near the Nine-mile Bridge and Situk River USFS cabins should be monitored in future seasons to determine if current use-level assumptions are correct.

Sampling of marine sport harvests in the Yakutat area should also be continued because of the opportunity to document and manage what has been a relatively unexploited lingcod and Pacific halibut fishery resource that is now experiencing a relatively rapid expansion of effort and harvest. Similarly, chinook and coho salmon stock composition data should also be gathered from the marine sport fishery to provide for more effective management of these species in Southeast Alaska.

Table 11.—Comparison of onsite creel survey and statewide harvest survey (SWHS) estimates of chinook and sockeye salmon harvests for the Situk River sport fishery, 1998–1999. Harvests which appear to be significantly different (non-overlapping confidence intervals) are highlighted in **bold**. The 1998 SWHS estimates are from Howe et al. (2001b) while 1999 SWHS estimates are from Howe et al. (2001c).

Year	Location of harvest	Species	Onsite survey		Statewide harvest survey (SWHS)	
			Estimate	95% CI ^a	Estimate	95% CI
1998	Above & below weir	Large chinook salmon ^b	807	480–1,134	1,156	701–1,669
	Above & below weir	Sockeye salmon	5,289	3,911–6,667	9,448	6,685–12,237
	Above weir	Large chinook salmon ^b	415	225–605	635	297–1,055
	Below weir	Large chinook salmon ^a	392	180–604	521	275–827
	Above weir	Sockeye salmon	1,297	872–1,722	4,468	2,664–6,794
	Below weir	Sockeye salmon	3,991	2,801–5,175	4,980	3,147–6,880
1999	Above & below weir	All chinook salmon	1,345	963–1,727	1,545	900–2,300
	Above & below weir	Large chinook salmon ^c	1,046	742–1,350	1,160	752–1,617
	Above & below weir	Sockeye salmon	6,393	4,911–7,874	7,199	4,851–9,805
	Above weir	Large chinook salmon ^c	553	328–778	598	286–984
	Below weir	Large chinook salmon ^c	493	354–632	562	321–834
	Above weir	Sockeye salmon	813	480–1,146	2,912	1,487–4,841
	Below weir	Sockeye salmon	5,580	4,222–6,938	4,287	2,616–6,203

^a 95% confidence intervals calculated as estimate $\pm 1.96 \times$ SE.

^b Large chinook salmon in 1998 onsite survey and in SWHS were those 16 inches or more in length.

^c Large chinook salmon in 1999 onsite survey were those 28 inches or more in length, while in the SWHS survey were those 16 inches or more in length.

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APPENDIX A

Appendix A1.–Summary of creel survey sampling results by interview period and date at the Lower Landing access location on the Situk River, 1998.

Date	Interview period ^a	Anglers observed	Anglers interviewed	Reported chinook ^b catch	Observed chinook ^b harvest	Reported hours of effort
06/10/98	3	10	10	0	0	75
06/11/98	1	1	1	0	0	4
06/12/98	2	27	27	0	0	140
06/16/98	3	33	33	3	3	212
06/17/98	1	3	3	0	0	11
06/18/98	2	28	28	1	1	207
06/19/98	3	50	50	5	5	324
06/22/98	3	46	46	10	10	374
06/23/98	1	10	10	1	1	47
06/24/98	2	48	47	10	8	362
06/25/98	3	40	40	3	3	282
06/28/98	3	40	40	7	7	382
06/29/98	1	5	5	0	0	21
06/30/98	2	20	20	11	9	172
07/01/98	3	38	38	67	51	343
07/04/98	3	65	65	26	15	625
07/05/98	1	5	5	0	0	20
07/06/98	2	23	23	48	31	192
07/07/98	3	8	8	2	2	66
07/10/98	3	37	37	80	70	285
07/11/98	1	0	0	0	0	0
07/12/98	2	11	11	30	21	50
07/13/98	3	28	28	52	48	227
07/16/98	3	16	16	38	38	129
07/17/98	1	0	0	0	0	0
07/18/98	2	9	9	11	3	61
07/19/98	3	15	15	31	25	124
07/22/98	3	4	4	7	6	32
07/23/98	1	0	0	0	0	0
07/24/98	2	0	0	0	0	0
07/25/98	3	0	0	0	0	0
Total		620	619	443	357	4,767

^a 1 = Early-day (0600 to 1200 hours), 2 = Mid-day (1200 to 1800 hours), 3 = Late-day (1800 to 2400 hours).

^b Chinook salmon of all sizes.

Appendix A2.–Summary of creel survey sampling results by interview period and date at the Lower Landing access location on the Situk River, 1999.

Date	Interview period ^a	Anglers observed	Anglers interviewed	Reported chinook ^b catch	Observed chinook ^b harvest	Reported hours of effort
06/09/99	3	0	0	0	0	0
06/10/99	2	0	0	0	0	0
06/11/99	2	0	0	0	0	0
06/12/99	2	29	29	0	0	158
06/15/99	2	35	35	4	4	167
06/16/99	2	18	18	0	0	64
06/17/99	2	40	40	0	0	203
06/18/99	2	59	59	5	5	280
06/21/99	2	55	55	13	13	311
06/22/99	2	59	59	8	8	266
06/23/99	2	38	38	28	27	184
06/24/99	3	66	66	6	4	303
06/27/99	3	82	82	24	24	491
06/28/99	3	80	80	9	6	466
06/29/99	2	51	51	33	28	285
06/30/99	3	69	69	43	27	367
07/03/99	3	60	60	11	10	343
07/04/99	2	52	52	59	37	300
07/05/99	2	64	64	57	43	274
07/06/99	3	66	66	14	10	401
07/09/99	3	75	75	34	20	424
07/10/99	3	44	44	15	14	247
07/11/99	3	48	48	18	14	176
07/12/99	2	35	35	39	29	176
07/14/99	2	31	31	21	8	111
07/15/99	3	26	26	23	17	136
07/16/99	2	31	31	22	14	179
07/18/99	3	16	16	20	6	75
07/20/99	3	16	16	10	8	72
07/21/99	3	29	29	21	19	105
07/23/99	2	10	10	11	6	47
07/24/99	3	21	21	9	9	87
07/26/99	2	10	10	11	11	57
07/27/99	3	19	19	0	0	67
07/28/99	2	6	6	4	4	20
07/30/99	3	10	10	0	0	38
Total		1,350	1,350	572	425	6,880

^a 2 = Mid-day (1100 to 1730 hours), 3 = Late-day (1730 to 2400 hours).

^b Chinook salmon of all sizes.

Appendix A3.–Summary of sampling results by week at Yakutat Small Boat Harbor, 1998.

Week	Boats surveyed	No. of anglers	Chinook salmon	Coho salmon	Lingcod	Pacific halibut
04/13-04/19	0	0	0	0	0	0
04/20-04/26	7	15	1	0	0	30
04/27-05/03	9	35	2	0	7	66
05/04-05/10	11	37	1	0	8	35
05/11-05/17	12	58	9	0	22	98
05/18-05/24	7	24	14	0	7	33
05/25-05/31	5	20	0	0	6	33
06/01-06/07	23	101	35	0	45	150
06/08-06/14	22	70	5	0	28	103
06/15-06/21	22	87	1	0	43	149
06/22-06/28	34	140	20	0	69	209
06/29-07/05	23	94	8	0	38	138
07/06-07/12	24	89	0	0	28	131
07/13-07/19	11	39	0	0	18	68
07/20-07/26	27	108	4	100	4	128
07/27-08/02	22	79	4	180	14	72
08/03-08/09	18	64	2	154	15	53
08/10-08/16	35	132	0	697	72	145
08/17-08/23	32	144	3	676	60	169
08/24-08/30	26	111	0	295	27	84
08/31-09/06	31	141	0	274	26	83
09/07-09/13	23	92	0	51	47	125
09/14-09/20	13	59	0	39	42	77
09/21-09/27	13	61	0	6	57	52
Total	450	1,800	109	2,472	683	2,231

Appendix A4.–Summary of sampling results by week at Yakutat Small Boat Harbor, 1999.

Week	Boats surveyed	No. of anglers	Chinook salmon	Coho salmon	Lingcod	Pacific halibut
04/12-04/18	5	12	2	0	0	21
04/19-04/25	4	13	11	0	0	21
04/26-05/02	5	19	5	0	0	25
05/03-05/09	10	39	8	0	6	42
05/10-05/16	11	35	9	0	4	27
05/17-05/23	12	40	6	0	11	47
05/24-05/30	14	51	21	0	4	60
05/31-06/06	23	87	25	0	33	108
06/07-06/13	17	65	18	0	21	90
06/14-06/20	31	127	16	0	59	199
06/21-06/27	40	167	3	0	107	271
06/28-07/04	41	182	14	18	138	202
07/05-07/11	39	150	1	27	50	149
07/12-07/18	30	130	1	16	50	143
07/19-07/25	19	90	1	8	44	132
07/26-08/01	24	93	2	115	16	94
08/02-08/08	31	97	4	190	43	88
08/09-08/15	26	99	0	280	33	125
08/16-08/22	69	267	1	1,053	30	227
08/23-08/29	46	158	5	596	23	28
08/30-09/05	102	343	0	839	97	215
09/06-09/12	35	147	0	307	44	66
09/13-09/19	16	63	1	93	4	26
Total	650	2,474	154	3,542	817	2,406

Appendix A5.–Major computer data files used for analysis of Yakutat marine and Situk River fisheries in 1998 and 1999. Custodians of data files listed below include the author and the Alaska Department of Fish and Game, Division of Research and Technical Services, Anchorage, Alaska. File archive name is “Yakutat9899.zip”

File name	File type	File description
Situk 98 Creel.zip	WinZip file	1998 Situk River creel analysis
Situk 99 Creel.zip	WinZip file	1999 Situk River creel analysis
FINAL 98 Marine Boat CS.xls	Excel workbook	1998 Marine boat sample data
FINAL 99 Marine Boat CS.xls	Excel workbook	1999 Marine boat sample data
Yakutat_AWL data.zip	WinZip file	Lingcod, halibut, and chinook awl data
Situk_SWHS_SE's for 98-99.doc	Word document	Standard errors from SWHS
CWT_Yak_98-99.zip	WinZip File	CWT data analysis for 1998 and 1999