

Fishery Data Series No. 02-18

**Smolt Production and Harvest of Coho Salmon from
the Chilkat River, 2000-2001**

by

Randolph P. Ericksen

September 2002

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			confidence interval	C.I.
liter	L			correlation coefficient	R (multiple)
meter	m	east	E	correlation coefficient	r (simple)
metric ton	mt	north	N	covariance	cov
milliliter	ml	south	S	degree (angular or temperature)	$^\circ$
millimeter	mm	west	W	degrees of freedom	df
		Copyright	©	divided by	÷ or / (in equations)
		Corporate suffixes:		equals	=
		Company	Co.	expected value	E
		Corporation	Corp.	fork length	FL
		Incorporated	Inc.	greater than	>
		Limited	Ltd.	greater than or equal to	≥
		et alii (and other people)	et al.	harvest per unit effort	HPUE
		et cetera (and so forth)	etc.	less than	<
		exempli gratia (for example)	e.g.,	less than or equal to	≤
		id est (that is)	i.e.,	logarithm (natural)	ln
		latitude or longitude	lat. or long.	logarithm (base 10)	log
		monetary symbols (U.S.)	\$, ¢	logarithm (specify base)	log ₂ , etc.
		months (tables and figures): first three letters	Jan,...,Dec	mid-eye-to-fork	MEF
		number (before a number)	# (e.g., #10)	minute (angular)	'
		pounds (after a number)	# (e.g., 10#)	multiplied by	x
		registered trademark	®	not significant	NS
		trademark	™	null hypothesis	H_0
		United States (adjective)	U.S.	percent	%
		United States of America (noun)	USA	probability	P
		U.S. state and District of Columbia abbreviations	use two-letter abbreviations (e.g., AK, DC)	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
				standard length	SL
				total length	TL
				variance	var
Weights and measures (English)					
cubic feet per second	ft ³ /s				
foot	ft				
gallon	gal				
Inch	in				
mile	mi				
ounce	oz				
pound	lb				
quart	qt				
yard	yd				
Spell out acre and ton.					
Time and temperature					
day	d				
degrees Celsius	°C				
degrees Fahrenheit	°F				
hour (spell out for 24-hour clock)	h				
minute	min				
second	s				
Spell out year, month, and week.					
Physics and chemistry					
all atomic symbols					
alternating current	AC				
ampere	A				
calorie	cal				
direct current	DC				
hertz	Hz				
horsepower	hp				
hydrogen ion activity	pH				
parts per million	ppm				
parts per thousand	ppt, ‰				
volts	V				
watts	W				

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This investigation was partially financed by the Federal Aid in Sport Fish Restoration Act (16 U.S.C. 777-777K) under Project F-10-15, F-10-16, and F-10-17, Job No. S-1-5.

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This document should be cited as:

Ericksen, Randolph P. 2002. Smolt Production and Harvest of Coho Salmon from the Chilkat River, 2000–2001. Alaska Department of Fish and Game, Fishery Data Series No. 02-18, Anchorage.

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ABSTRACT

The purpose of this study was to estimate smolt production and adult harvest of Chilkat River coho salmon *Oncorhynchus kisutch*. Coho salmon smolt were captured in three locations of the Chilkat River drainage during the spring of 2000, marked with an adipose finclip and a coded wire tag (CWT), and sampled for age, weight, and length. Adult coho salmon were sampled for CWTs in sport and commercial fisheries harvests throughout Southeast Alaska during 2001. In addition, coho salmon were sampled in the Chilkat River to determine the marked fraction to enable us to produce estimates of the 2000 coho smolt emigration and the 2001 harvest of adult coho salmon in sampled fisheries.

We marked and released 25,016 coho salmon smolt ≥ 75 mm during the spring of 2000 with an adipose finclip and a CWT. Most (89.3%, SE = 2.2%) of the smolt emigrating were age 1. We captured a total of 2,369 adult coho salmon aged 1.1 or 2.1 in fish wheels operating in the lower Chilkat River during 2001 and sampled for marks. Forty-nine (49) of these were marked as smolt in 2000. On the basis of these data, we estimated that 1,185,805 (SE = 164,121) coho salmon smolt emigrated from the Chilkat River in 2000.

In 2001, 251 CWTs with Chilkat River tag codes were recovered from coho salmon during the random sampling of various sport and commercial harvests. An estimated 48,043 (SE = 4,566) coho salmon bound for the Chilkat River were harvested in commercial, sport, and subsistence fisheries in 2001. Most (63.7%) of the harvest occurred in the commercial troll fishery (30,624, SE = 3,941), followed (28.5%) by the Lynn Canal drift gillnet fishery (13,709, SE = 2,213). The remainder of the harvests occurred in the recreational (6.1%), commercial seine (1.4%), and subsistence (0.3%) fisheries.

Key words: Mark-recapture, coded wire tag, rotary smolt trap, harvest, contribution, subsistence fishery, recreational fishery, troll fishery, drift gillnet fishery, seine fishery, age composition, size composition, sex composition, length-at-age, weight-length model, coho salmon, *Oncorhynchus kisutch*, Chilkat River, Kelsall River, Haines, Southeast Alaska

INTRODUCTION

The purpose of this study was to monitor smolt production and adult harvest of Chilkat River coho salmon *Oncorhynchus kisutch*. The long-term goal of this study is to gather information needed to manage harvests in accordance with sustained yield management.

The freshwater coho salmon fishery in Haines provides a small but important component of the local economy. In 1988, anglers fishing in Haines and Skagway for coho salmon spent an estimated \$181,000 (Jones and Stokes 1991). This fishery operates late in the year when other fisheries have finished and is popular both with local and non-local anglers. Ninety percent (90%) of anglers who fished in fresh water during 1985 were from out of town (Bethers 1986). The Chilkat River produces most of the coho salmon harvested in Haines area sport fisheries and supports one of the largest freshwater coho fisheries in the Southeast region, with an average annual harvest of about 1,000 coho salmon (Mills 1979–1994, Howe et al. 1995–2001, Walker et al. *In prep.*). This stock also contributes a significant

number (more than 40,000 per year) of fish to the commercial troll, gillnet, and seine fisheries in northern Southeast Alaska (Elliott and Kuntz 1988, Shaul et al. 1991, Ericksen 2001).

The Chilkat River is a large glacial system that originates in British Columbia, Canada, flows through rugged dissected mountainous terrain, and terminates in Chilkat Inlet near Haines, Alaska (Figure 1). The mainstem and major tributaries comprise approximately 350 km of river channel in a watershed covering about 1,600 km² (Bugliosi 1988).

The Chilkat River is the third or fourth largest producer of coho salmon in Southeast Alaska (Scott McPherson, Alaska Department of Fish and Game, Douglas, personal communication). Research conducted during the 1980s on coho salmon stocks in Lynn Canal (including the Chilkat River), concluded that these stocks have, at times, been subjected to very high (over 85%) exploitation rates (Elliott and Kuntz 1988, Shaul et al. 1991).

The current management program for Chilkat River coho salmon relies on monitoring of

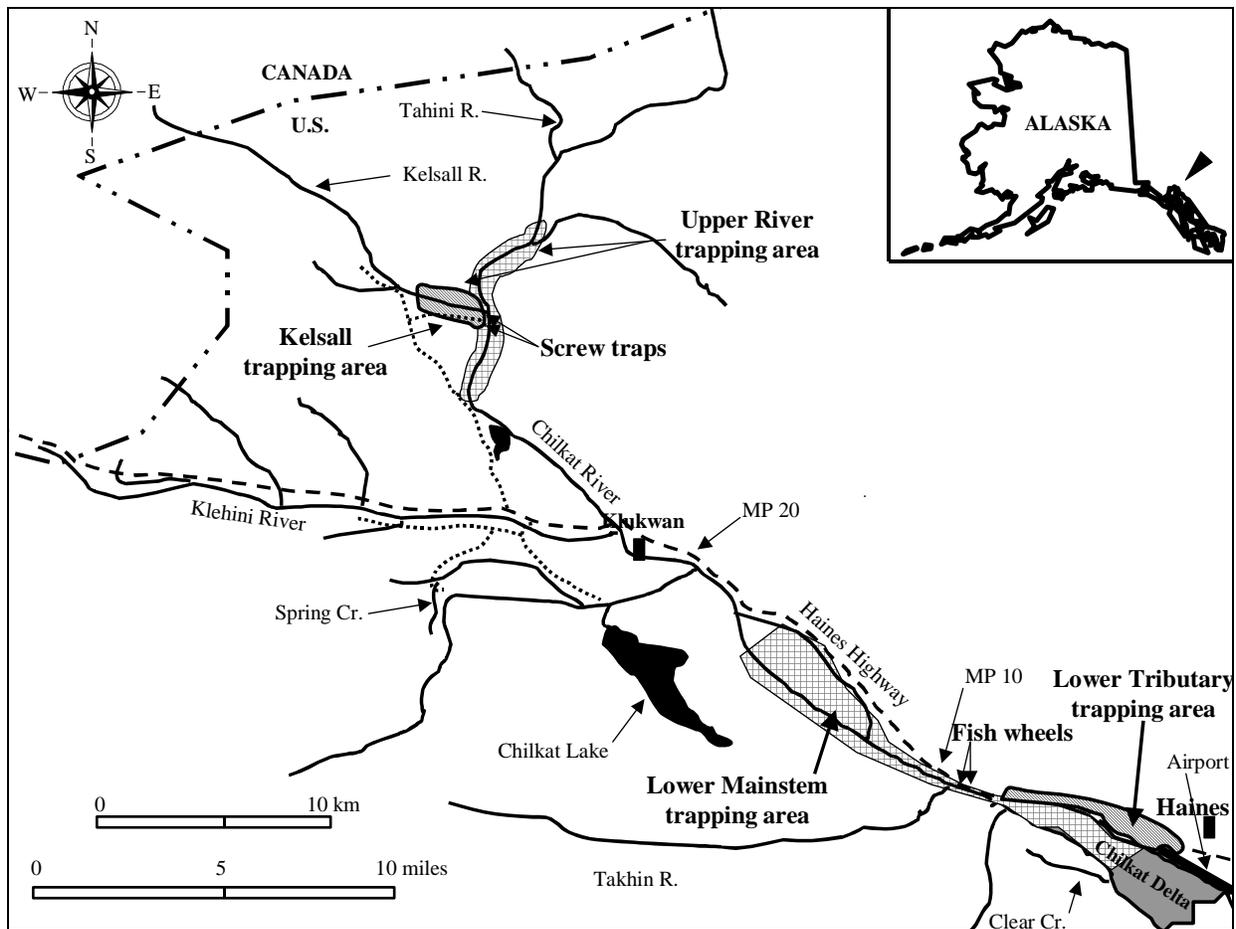


Figure 1.–The Chilkat River drainage showing location of sampling sites.

spawning escapements on four index streams: Clear Creek, Spring Creek, Tahini River, and Kelsall River (Figure 1). Alaska Department of Fish and Game (ADF&G) personnel survey the index streams by foot or boat on a weekly basis during peak spawning and count the number of adult coho salmon. The peak number counted for each stream is used as the index count for that year. The escapement of coho salmon to the Chilkat River drainage has been estimated for two years. The estimated escapement was 80,700 (90% CI = 70,000 – 95,600, Dangel et al. *Unpublished*) in 1980 and 37,132 (SE = 7,432, Ericksen 1999) in 1998. Coho salmon coded wire tag (CWT) studies have also been conducted in the Chilkat River drainage periodically between 1977 and 1984 (Ericksen 2001).

This was the second year of a study designed to monitor smolt production and adult harvest of Chilkat River coho salmon. During the first year of the study, we estimated that 1,237,056 (SE = 219,715) smolt emigrated from the Chilkat River in 1999, and 40,569 (SE = 3,752) Chilkat River coho salmon were harvested in commercial, sport, and subsistence fisheries during 2000 (Ericksen 2001). Research objectives for this study were to:

1. estimate the number of coho salmon smolt leaving the Chilkat River in 2000;
2. estimate the age composition of salmon smolt leaving the Chilkat River in 2000;
3. estimate the age and sex composition of adult coho salmon entering the Chilkat River in 2001; and,

4. estimate the marine harvest of Chilkat River coho salmon in sampled fisheries in 2001.

METHODS

Coho salmon smolt were captured in the Chilkat River during the spring of 2000 and marked with an adipose finclip and a CWT. Adult coho salmon were sampled for CWTs in sport and commercial fisheries harvests throughout Southeast Alaska in 2001. In addition, returning adult coho salmon were sampled in the Chilkat River in 2001 to determine the marked fraction for estimating the 2000 coho smolt emigration and the harvest of adult coho salmon in sampled fisheries in 2001.

SMOLT CAPTURE, CODED WIRE TAGGING, AND SAMPLING

Smolt were captured at three locations in the Chilkat River drainage: the “upper river” which included the Kelsall River and the mainstem of the Chilkat River above Klukwan; the “lower mainstem” that consisted of the mainstem of the Chilkat River from the airport upstream to approximately Haines Highway milepost (MP) 16; and, the “lower tributaries” consisting of tributary streams crossing the Haines Highway from the airport to MP 8, during spring 2000 (Figure 1). Two crews captured smolt in baited minnow traps in the lower mainstem between April 17 and June 6, and in the lower tributaries, between April 17 and May 27. Another crew captured smolt in the upper river between April 30 and May 26, with baited minnow traps and two 8-ft-diameter rotary smolt traps constructed by E.G. Solutions of Corvallis, Oregon.

Two crews of two people fished an average of 52 G-40 minnow traps per day in the lower mainstem, and 50 per day in the lower tributaries. Traps were baited with disinfected salmon roe and checked at least once per day. Crew members immediately released obviously undersized or non-target species at the trapping site. Remaining fish were transported to holding boxes for processing at the tagging site located on the bank of the Chilkat River adjacent to the Haines Highway mile 7.5. Water depth (cm), and temperature (°C) were recorded each morning near MP 8.

Two rotary smolt traps were fished in the Chilkat River downstream of the Kelsall River confluence (upper river). One trap was fished from May 6 to May 26, immediately below the confluence with the Kelsall River (Figure 1). The second trap was fished from April 30 to May 26, about 500 m below the confluence (Figure 1). Each trap consisted of a cone, a live box, two pontoons for flotation, an apparatus to lift the cone from the water, and a mechanism to clean debris from the live box. The cone (8 ft in diameter) faced upriver, and rotary blades within the cone corkscrewed back to a narrow exit and live box; the junction between exit and live box was sealed with a rubber collar to prevent fish from escaping. Both traps were held offshore 2–4 m by boom logs fixed to the bank and tied off by a tag line fixed to the front pontoons. In addition, a safety line of 3/4-in. polypropylene line tied to the inshore pontoon secured each trap. Vexar “wing” panels were used on both sides of each trap to direct smolt toward the cone and increase capture efficiency. Two members of a three-person crew were on duty at each trap to attempt to keep the traps fishing 24 hours a day. However, large debris was a chronic problem during high water periods. At times, the traps were not fished during the day when smolt catches were low to minimize maintenance caused by debris. Each morning and evening, fine debris was removed from the cones by scrubbing them with a brush and rinsing with water. Salmonid smolt and fry were removed from trap live boxes during each visit. Coho and chinook *O. tshawytscha* salmon smolt were separated from other species, and transported to holding boxes at the tagging site located on the west bank of the Chilkat River downstream of the Kelsall River. Other species were identified, counted, and released (Appendix A1 and A2). Minnow traps were also fished in the upper Chilkat and Kelsall rivers (Figure 1) as time allowed.

All healthy juvenile coho ≥ 75 mm fork length (FL) were marked with an adipose finclip and a CWT. Fish were first tranquilized in a solution of tricain-methane sulfanate (MS 222) buffered with sodium bicarbonate. The MS 222 solution was maintained at a constant water temperature by pumping it through a continuous loop containing a coil of aluminum tubing submerged

in the river. Smolt were tagged with a CWT and marked by excision of the adipose fin, following the methods in Koerner (1977). Every 20th coho salmon smolt tagged at the upper site was measured to the nearest mm FL. Every 60th coho salmon smolt tagged at the lower site was measured to the nearest mm FL, weighed to the nearest g, and scale sampled (for age). Twelve to 15 scales were taken two rows above the lateral line on the left side of each sampled smolt just ahead of the adipose fin (Scarnecchia 1979). Scales were mounted individually between two 25 mm × 75 mm glass slides and viewed through a microfiche reader at 70× magnification. Age was determined once for each fish and reported in European notation. All chinook salmon smolt ≥50 mm were also marked as above using a separate tag code.

All marked smolt were held overnight to check for 24-hour tag retention and handling induced mortality. The following morning 100 fish in the previous day's catch were randomly selected and checked for the retention of CWTs and mortality. If tag retention was 98/100 or greater, mortalities were counted and all live fish from that batch were released. If tag retention was less than 98/100, the entire batch of smolt was checked for tag retention and those that tested negative were re-tagged. The number of fish tagged, number of tagging-related mortalities, and number of fish that had shed their tags were compiled and submitted to the Commercial Fisheries Division (CFD) Tag Lab in Juneau at the completion of the field season.

INRIVER ADULT CAPTURE AND SAMPLING

Returning coho salmon were captured in fish wheels operating adjacent to the Haines Highway MP 9 (Figure 1) during 2001. CFD personnel installed two 3-basket aluminum fish wheels in early June to monitor escapement of sockeye salmon *O. nerka* to the Chilkat River. The Division of Sport Fish provided funding for the fish wheels, beginning September 16, to sample coho salmon. One fish wheel operated adjacent to the Haines Highway near highway MP 9, and the other about 300 m downstream of the first. The fish wheels were operated continuously from June 5 through October 7, except for maintenance. The wheels were located along the east bank of the

river where the main flow was constrained primarily to one side of the floodplain. Water depth (cm), and temperature (°C) were recorded each morning near highway MP 8.

Captured coho salmon were visually examined to estimate sex, measured to the nearest mm mideye-to-fork (MEF), and inspected for missing adipose fins. A scale sample was collected from every other coho salmon captured. Four scales were removed from the left side of the fish, along a line 2 to 4 scale rows above the lateral line between the posterior insertion of the dorsal fin and anterior insertion of the anal fin. Ages were determined from patterns of circuli according to protocols in Mosher (1968). Fish that were not assigned an age were classified as 1-ocean-age fish (emigrated as smolt in 2000) if they were 400 mm or greater MEF.

Fish-wheel personnel retained heads from coho salmon missing adipose fins, and a plastic cinch strap with a unique number was inserted through the jaw of the head. Heads and CWT recovery data were sent to the ADF&G CWT Processing Laboratory in Juneau where any tags present were removed, decoded, and corresponding information entered into the lab database.

SMOLT ABUNDANCE

A two-event mark-recapture experiment was used to estimate the abundance of coho salmon smolt emigrating from Chilkat River in 2000. The number of smolt marked during the spring of 2000 defined the first sampling event. Sampling returning adults for missing adipose fins during the fall of 2001 defined the second sampling event.

Abundance (numbers emigrating) of coho salmon smolt was estimated using the Chapman's modified Petersen estimator for a closed population (Seber 1982):

$$\hat{N} = \frac{(n_1 + 1)(n_2 + 1)}{(m_2 + 1)} - 1 \quad (1a)$$

$$\text{var}[\hat{N}] = \frac{(n_1 + 1)(n_2 + 1)(n_1 - m_2)(n_2 - m_2)}{(m_2 + 1)^2(m_2 + 2)} \quad (1b)$$

where n_1 is the number of smolt marked in the spring of 2000, n_2 is the number of age 1.1 and 2.1 coho salmon captured in the Chilkat River fish wheels in 2001, and m_2 is the subset of n_2 which had been marked as coho smolt in 2000.

The validity of the mark-recapture experiment rests on several assumptions: (a) that every fish has an equal probability of being marked during event 1, or that every fish has an equal probability of being captured in event 2, or that marked fish mix completely with unmarked fish; (b) that recruitment and “death” (emigration) do not both occur between sampling events; (c) that marking does not affect catchability (or mortality) of the fish; (d) that fish do not lose marks between sample events; (e) that all recovered marks are reported; and (f) that double sampling does not occur (Seber 1982).

AGE, SEX, AND SIZE COMPOSITIONS

Age composition of coho salmon smolt in 2000 and age and sex compositions of adults in 2001 were estimated from systematically drawn samples.

Age compositions for smolt were tabulated separately for each sampling location. Differences in age composition between areas were investigated by contingency table analysis and data were pooled when no differences were found.

Proportions in the age or sex compositions and their variances were estimated as

$$\hat{p}_a = \frac{n_a}{n} \quad (2a)$$

$$\text{var}[\hat{p}_a] = \frac{\hat{p}_a (1 - \hat{p}_a)}{n - 1} \quad (2b)$$

where n is the number of successfully aged (or sexed) fish and n_a is the subset of n determined to be age (or sex) a .

I also fit an allometric growth model (Quinn and Deriso 1999, pp. 129–131) to estimate the weight to length relationship of coho smolt as an annual measure of relative condition. A multiplicative error structure was used because the variation in weight increased with length. Mean length-at-age, weight-at-age, and variances were calculated using standard normal statistics.

HARVEST

Harvest in 2001 of coho salmon originating from the Chilkat River was estimated from fish sampled for CWTs from catches in commercial and recreational fisheries and in the Chilkat River escapement. Because several fisheries exploited coho salmon over several months in 2001, harvest was estimated over several strata, each a combination of time, area, and type of fishery. Statistics from the commercial troll fishery were stratified by fishing period and by fishing quadrant. Statistics from drift gillnet fisheries were stratified by week and by fishing district. Statistics from the recreational fishery were stratified by fortnight. Oliver (1990) and Hubartt et al. (1997) give details of sampling commercial and recreational fisheries. The fraction of the return to the Chilkat River with tags was estimated as the fraction of the adults sampled in the fish wheels that had valid, decoded CWTs.

Data from the catch and field sampling programs was expanded to estimate harvest \hat{r}_i and the associated variance of coho salmon bound for the Chilkat River for each stratum, using methods and equations from Bernard and Clark (1996: Table 2). Estimates of harvest were summed across strata and across fisheries to obtain an estimate of the total \hat{T} :

$$\hat{T} = \sum_i \hat{r}_i \quad (3a)$$

$$\text{var}[\hat{T}] = \sum_i \text{var}[\hat{r}_i] \quad (3b)$$

Variance of the sum of estimates was estimated as the sum of variances across strata, because sampling was independent across strata and across fisheries.

A subset n_i of the catch in each stratum was counted and inspected to find recaptured fish. Of those inspected, a_i salmon were missing their adipose fin, and had their heads marked and sent to Juneau for dissection. Of the a_i' heads that arrived in Juneau, all were passed through a magnetometer to detect a CWT. Of the t_i tags detected, t_i' were successfully decoded under a microscope, after dissection of which m_{ci} had come from the Chilkat River.

MEAN DATE OF HARVEST

Estimates of the mean dates of harvest for commercial fisheries were calculated from the time series of estimated proportions of catches by strata within a fishery (Mundy 1982). The fraction of Chilkat River coho salmon in a fishery on day d was estimated as

$$\hat{P}_d = \frac{\hat{H}_d}{\sum_i H_i} \quad (4)$$

where \hat{H}_d is the estimated number of Chilkat River coho salmon harvested in a fishery on day d . The mean date of harvest in each fishery over a time interval of n strata was calculated as

$$\hat{d} = \sum_{d=1}^n d\hat{P}_d \quad (5)$$

RESULTS

2000 SMOLT TAGGING, AGE AND SIZE

We marked 25,118 coho salmon smolt ≥ 75 mm during the spring of 2000 with an adipose finclip and a CWT (Table 1). One hundred two (102) of these died within 24 h of tagging, leaving a total marked population of 25,016 (Table 2). An estimated 24 coho smolt shed their tags within 24h. In addition, we tagged 1,998 chinook salmon ≥ 50 mm, 2 of which died within 24h (Tables 1 and 2).

The relative timing of minnow trap coho salmon smolt catches varied considerably by area. The catch of coho salmon peaked in the lower tributaries on the first day of trapping, April 17 (Figure 2). In contrast, the catch in the lower mainstem was the greatest on May 31 (Figure 2), and the upper river on May 13 (Figure 3). However, minnow trapping effort varied over time for each area, and operation of the rotary smolt traps varied over time due to mechanical breakdowns and high debris loads (Appendix A1 and A2). The average catch of coho smolt per minnow trap (CPUE) in the lower tributaries was much higher early in the season peaking on April 17 (Figure 4). The CPUE in the lower mainstem peaked on May 22 (Figure 4). This compares with

minnow trap CPUE of coho smolt in the upper river that peaked on May 9 (Figure 5).

Three hundred seventy-six (376) coho salmon smolt ≥ 75 mm were sampled for age (scales), weight and length in the lower Chilkat River during spring 2000 (Table 3). In addition, 74 were sampled for length from the upper river (Table 3). The length distribution of coho sampled in the lower mainstem was not significantly different from those sampled from the lower tributaries (Figure 6; K-S test, $d_{\max} = 0.075$, $P = 0.679$). However, the age composition of smolt sampled at the lower mainstem (89.3% age 1) was significantly different ($\chi^2 = 7.18$, $df = 1$, $P = 0.007$) from that of those sampled at the lower tributaries (79.3% age 1, Table 3). In addition, smolt sampled from the upper river were significantly larger than those from the lower mainstem (Figure 6, K-S test, $d_{\max} = 0.323$, $P < 0.001$). Those sampled at the upper river averaged 97 mm FL (SE = 1.7 mm) compared to 88 mm (SE = 0.7) for those sampled at the lower mainstem (Table 3). Therefore, only those samples from the lower mainstem (Table 1), which are thought to be most representative of the emigration, were used to estimate age and size composition of smolt leaving the Chilkat River during 2000. Age-1 dominated the emigration (89.3%) of smolt from the Chilkat River. I fit the smolt weight-length model to 376 pairs of weight-length data (Figure 7). Parameter estimates for this model were $\alpha = -10.7$ (SE = 0.304) and $\beta = 2.81$ (SE = 0.068).

SMOLT ABUNDANCE

An estimated 1,185,804 (SE = 164,121) coho salmon smolt emigrated from the Chilkat River in 2000 ($n_1 = 25,016$, $n_2 = 2,369$, $m_2 = 49$). Between August 9 and October 7, 2001, we captured a total of 2,520 adult coho salmon from fish wheels operating in the lower Chilkat River and examined them for missing adipose fins (Figure 8, Table 4). Fifty-two (52) fish had missing adipose fins, and their heads were examined for CWTs (Table 4). Forty-eight (48) contained valid tags: 2 were tagged in 1999; 31 were tagged from the upper river and lower mainstem in 2000, 14 from the lower tributaries in 2000, and 1 had a tag code used for chinook salmon in 2000. In addition, 4 fish (all age 1.1) had no tags (Table 4).

Table 1.—Number of minnow traps checked and smolt caught and tagged in the Chilkat River drainage by time period and area, April 16 through June 6, 2000. (Note that tagging did not occur every day; therefore, fish caught during one time period may be tagged in the next time period.)

Dates	Lower river sites					Upper river									Total tagged	
	Lower mainstem			Lower tributaries		Kelsall River			Chilkat mainstem			Screw traps				
	Traps checked	Number tagged		Traps checked	Coho tagged	Traps checked	Number tagged		Traps checked	Number tagged		Number tagged		Coho	Chinook	
04/16-04/22	237	970	111	284	2,514										3,484	111
04/23-04/29	205	681	58	373	2,014										2,694	58
04/30-05/06	275	982	55	354	1,827	45	109	209	125	312	48	30	219		3,261	531
05/07-05/13	290	1,312	38	377	1,577	39	39	34	148	478	146	271	473		3,677	691
05/14-05/20	278	1,656	32	406	1,680	8	0	0	225	545	99	433	154		4,314	285
05/21-05/27	447	3,110	66	99	369	28	3	24	236	573	78	310	67		4,366	236
05/28-06/03	678	2,756	73												2,756	73
06/04-06/06	224	566	14												566	14
Total	2,634	12,033	447	1,893	9,982	120	151	267	734	1,908	372	1,044	912		25,118	1,998

7

Table 2.—Summary of coded wire tagging data in the Chilkat River drainage during the spring of 2000.

Tag code	Location	Species	Last date	Tagged	24h morts	Marked	Shed tags	Valid CWTs
04-02-60	Lower tributaries	coho	05/25/00	9,982	2	9,980	20	9,960
04-02-61	Lower mainstem	coho	06/03/00	10,778	22	10,756	0	10,756
04-03-61	Lower mainstem	coho	06/07/00	1,255	58	1,197	4	1,193
04-03-61	Upper river	coho	05/26/00	3,103	20	3,083	0	3,083
Coho subtotal				25,118	102	25,016	24	24,992
04-02-62	Lower mainstem	chinook	06/07/00	447	1	446	0	446
04-03-62	Upper river	chinook	05/27/00	1,551	1	1,550	0	1,550
Chinook subtotal				1,998	2	1,996	0	1,996

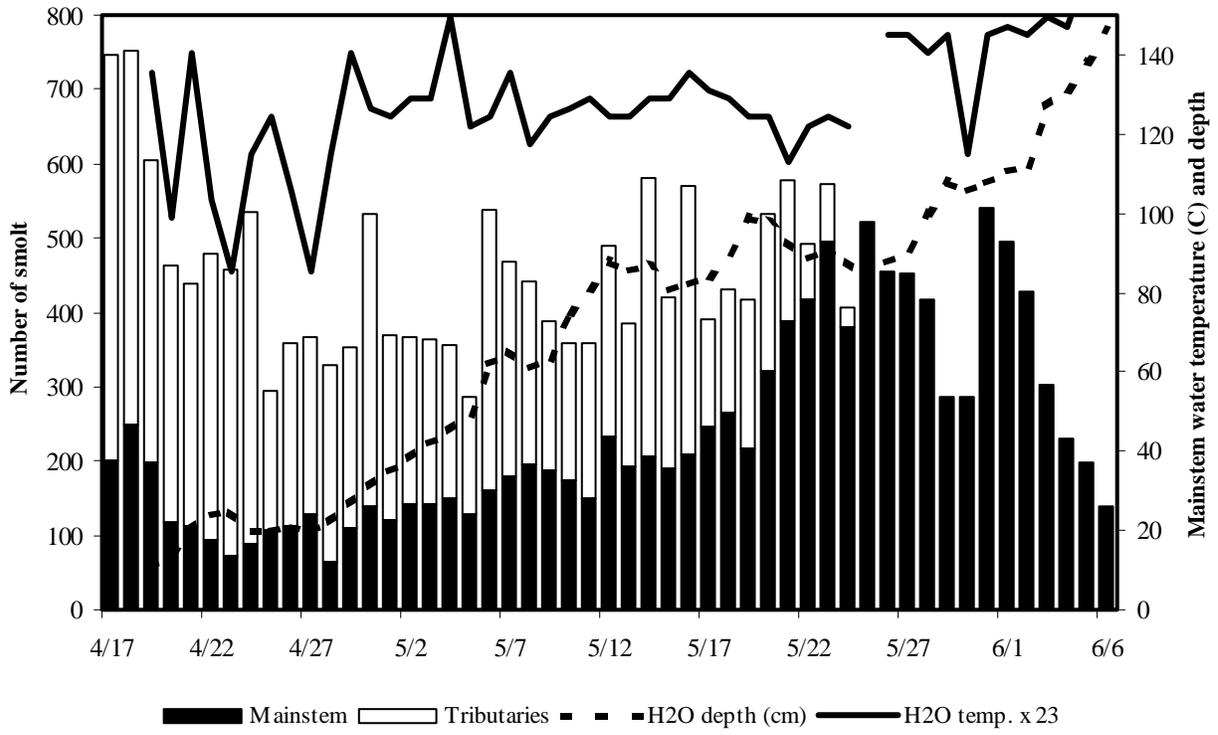


Figure 2.—Daily water depth (cm), temperature (°C) × 23, and minnow trap catches of coho salmon smolt ≥75 mm by area (mainstem or tributaries) in the lower Chilkat River, April 17 through June 6, 2000.

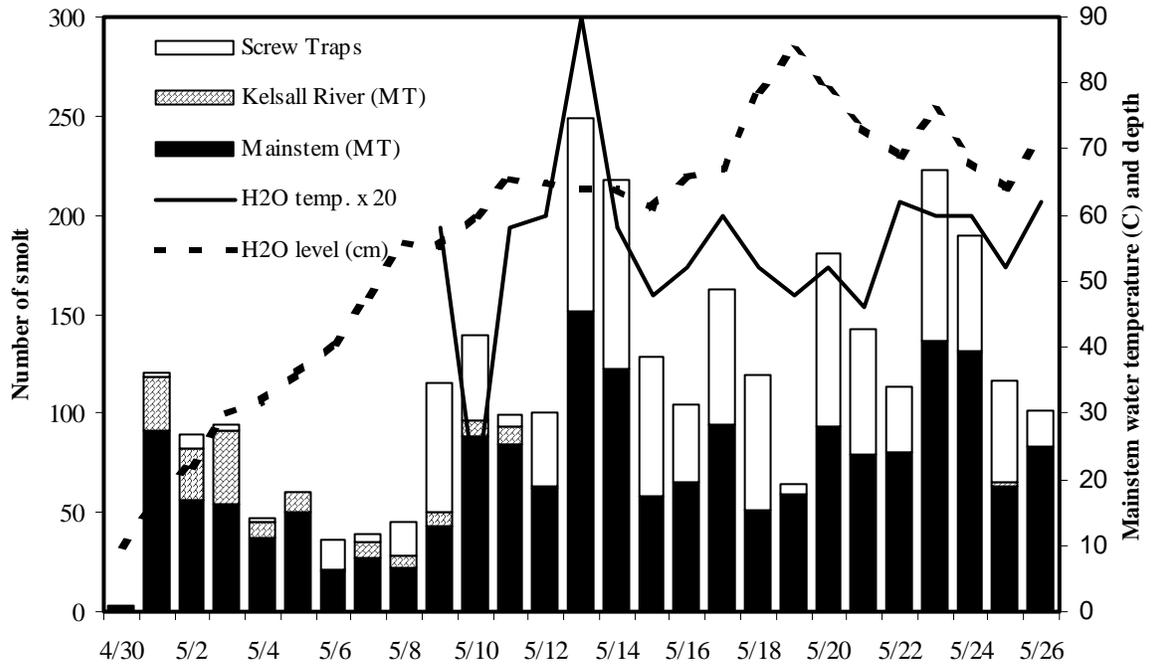


Figure 3.—Daily water depth (cm), temperature (°C) × 20, and catches of coho salmon smolt ≥75 mm in screw and minnow traps (MT) by area in the upper river, April 30 through May 26, 2000.

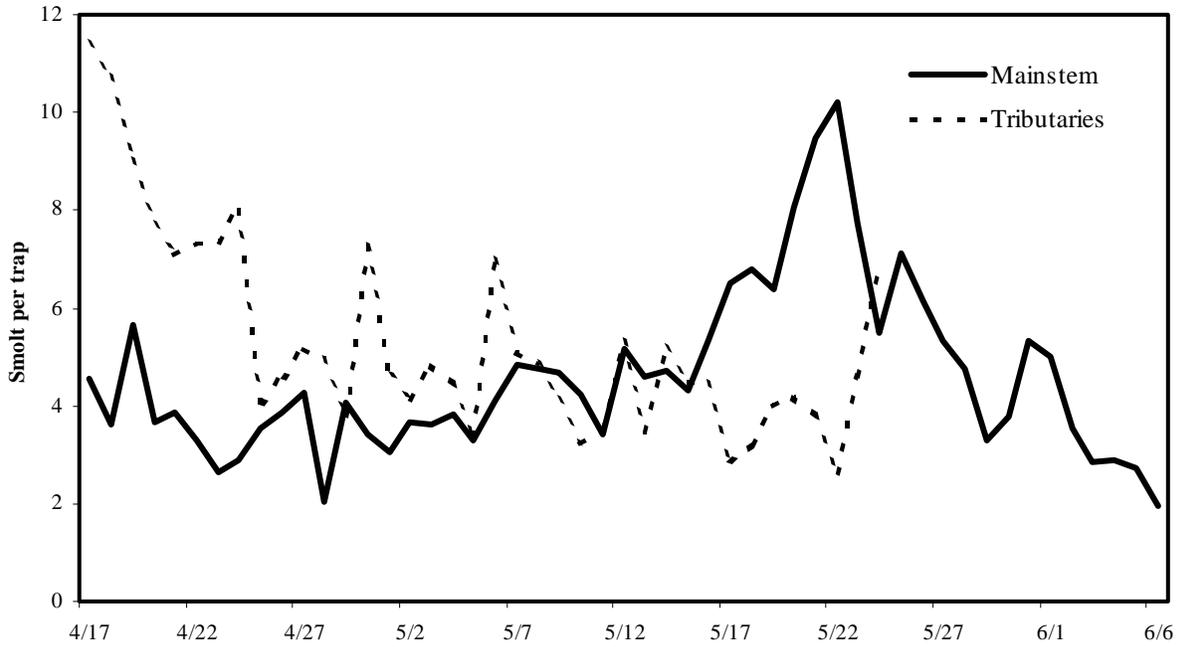


Figure 4.—Average daily catch of coho salmon smolt ≥ 75 mm per minnow trap, by trapping area in the lower river areas, April 17 through June 6, 2000.

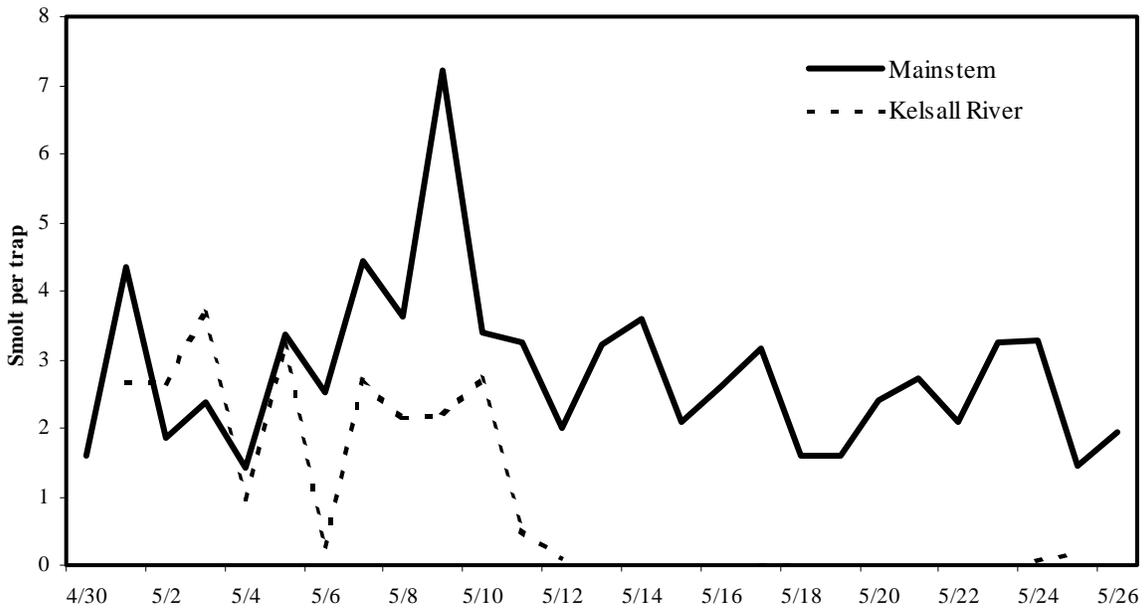


Figure 5.—Average daily catch of coho salmon smolt ≥ 75 mm per minnow trap, by trapping area in the upper river, April 30 through May 26, 2000.

Table 3.—Estimated age and size composition of juvenile coho salmon ≥ 75 mm FL marked in the Chilkat River drainage, by capture site, 2000.

		Age 1	Age 2	Total aged	Total sampled ^a
Lower mainstem	Sample size	184	22	206	208
	Percent (SE)	89.3 (2.2)	10.7 (2.2)		
	Mean length (SE)	(0.6)	102 (2.3)		88 (0.7)
	Mean weight (SE)	6.5 (0.1)	10.4 (0.7)		6.9 (0.2)
Lower tributaries	Sample size	130	34	164	168
	Percent (SE)	79.3 (3.2)	20.7 (3.2)		
	Mean length (SE)	85 (0.7)	96 (0.4)		87 (0.8)
	Mean weight (SE)	6.0 (0.2)	9.0 (0.4)		6.7 (0.2)
Upper river^b	Sample size				74
	Mean length (SE)				97 (1.7)

^a Includes fish that were not assigned an age.

^b Smolt were not sampled for scales (age) or weight at upper river locations.

We sampled 1,277 coho salmon caught at the fish wheels for scales, and 1,086 were successfully aged; 1,076 (99.1%) of these were age-1.1 or -2.1 (1-ocean-age fish) (Table 5). Thus, an estimated 2,369 adults captured in 2001 emigrated as smolt during 2000.

To estimate smolt abundance, all 1-ocean-age fish missing adipose fins except those with 1999 or chinook tag codes were considered marked (49). Thus, the marked fraction θ_s germane to estimating smolt estimate was 0.0209 (SE = 0.0029).

CODED WIRE TAG RECOVERY

In 2001, 251 CWTs with codes from Chilkat River drainage were recovered from coho salmon during the random sampling of various sport and commercial harvests (Table 6, Appendix A3). This includes one coho salmon that was recovered with tag code 04-02-62 used for chinook salmon and seven with 1999 codes (04-01-23 and 04-01-34, Table 6). Most tags (185) were recovered in the NW quadrant commercial troll fishery (Figure 9), followed by recoveries in the Lynn Canal District (115) commercial drift net fishery (52, Table 6). CWTs were also recovered in the NE quadrant troll fishery (4), inside purse seine fisheries (5), and the Sitka and Juneau marine sport fisheries (5).

Coho salmon bearing the different Chilkat River tag codes were recovered with similar relative frequencies in the Lynn Canal drift gillnet fishery from August 12 to October 6, and in the Northwest Quadrant troll fishery from July 1 to September 22 (Table 6). This indicates that tagged fish mixed well in the ocean environment. The percent of tags recovered in these two fisheries was 96% for all tag codes, with 21% recovered in gillnet and 75% in the troll fisheries.

There were eight select and voluntary recoveries of coho salmon bearing 2000 Chilkat River tag codes in 2001 (Appendix A3). One juvenile fish was recovered from the Chilkat River during our first day of tagging in 2001, April 18. Six adult coho salmon were voluntarily turned in from the troll fishery, and one from the Chilkat River sport fishery in 2001. The one freshwater recovery from the Chilkat River indicates that some coho salmon CWT tagged in 2000 held over a second year in fresh water before smolting in 2001.

HARVEST

An estimated 45,658 (SE = 7,194) coho salmon bound for the Chilkat River were harvested in sampled marine commercial and sport fisheries in 2001 (Table 7). An additional 126 coho salmon were harvested in the Chilkat Inlet and Chilkat

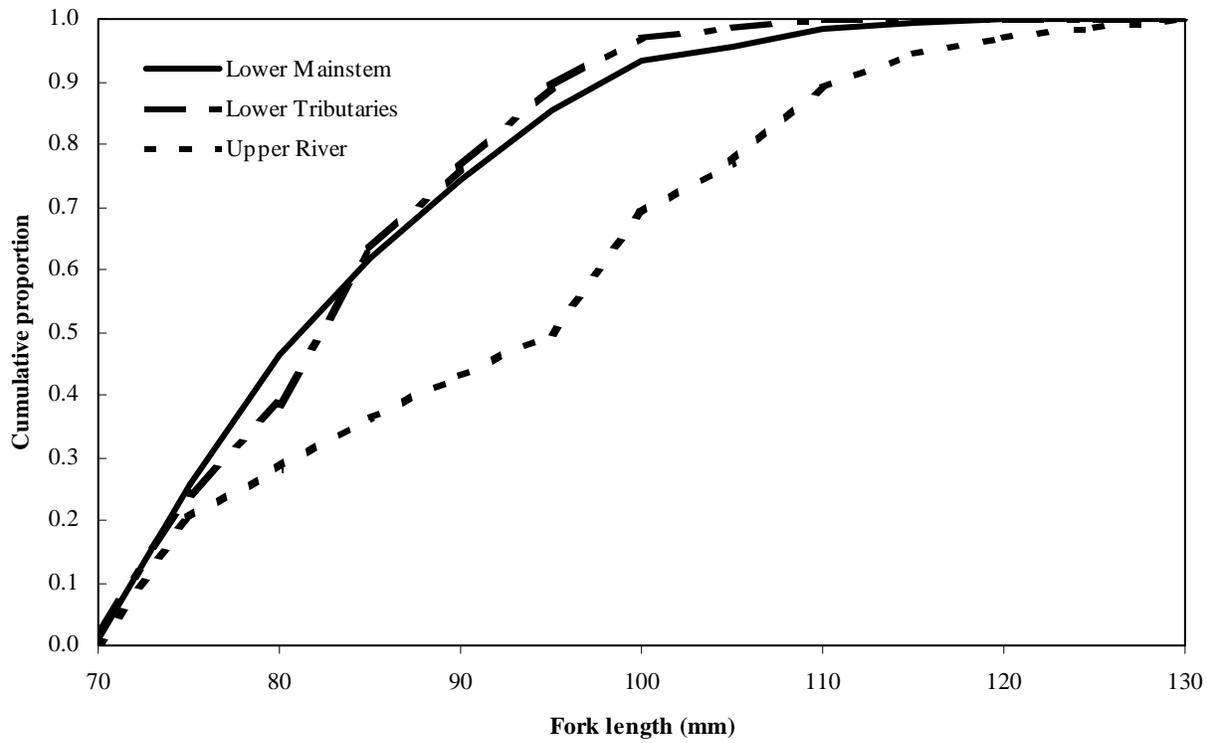


Figure 6.—Cumulative length frequency of coho salmon smolt sampled from Chilkat River locations, 2000.

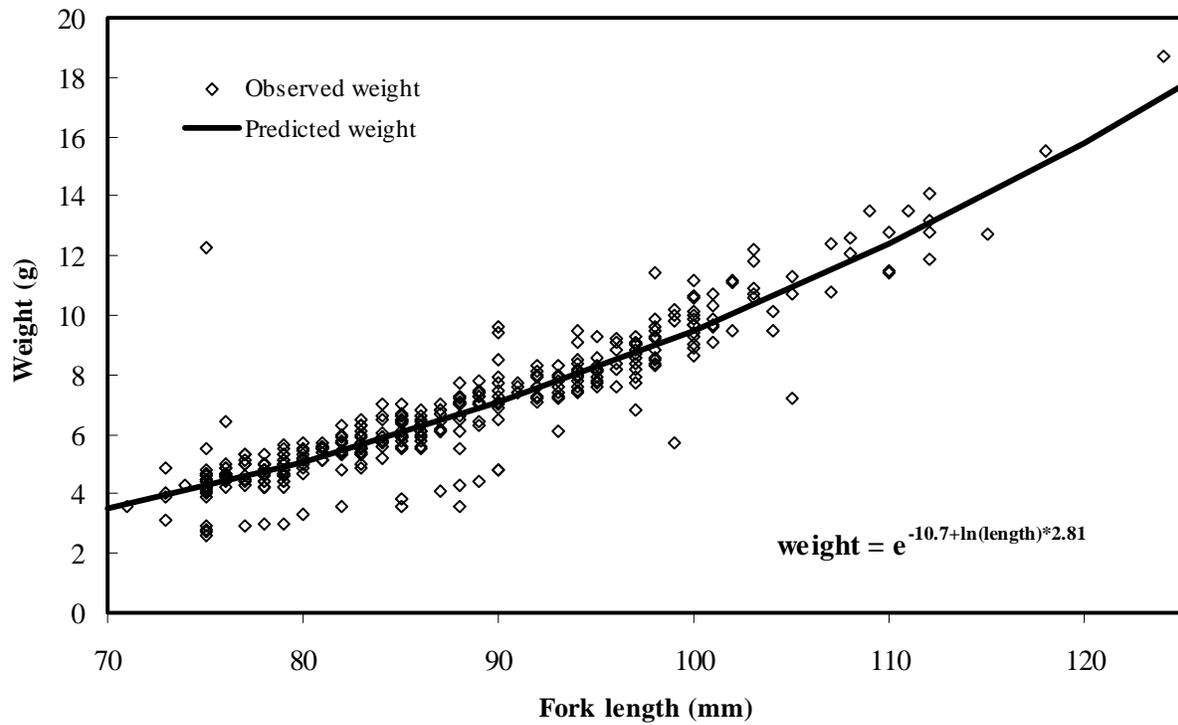


Figure 7.—Sampled weight and length and predicted weight from the weight-length model of Chilkat River coho salmon smolt in 2000.

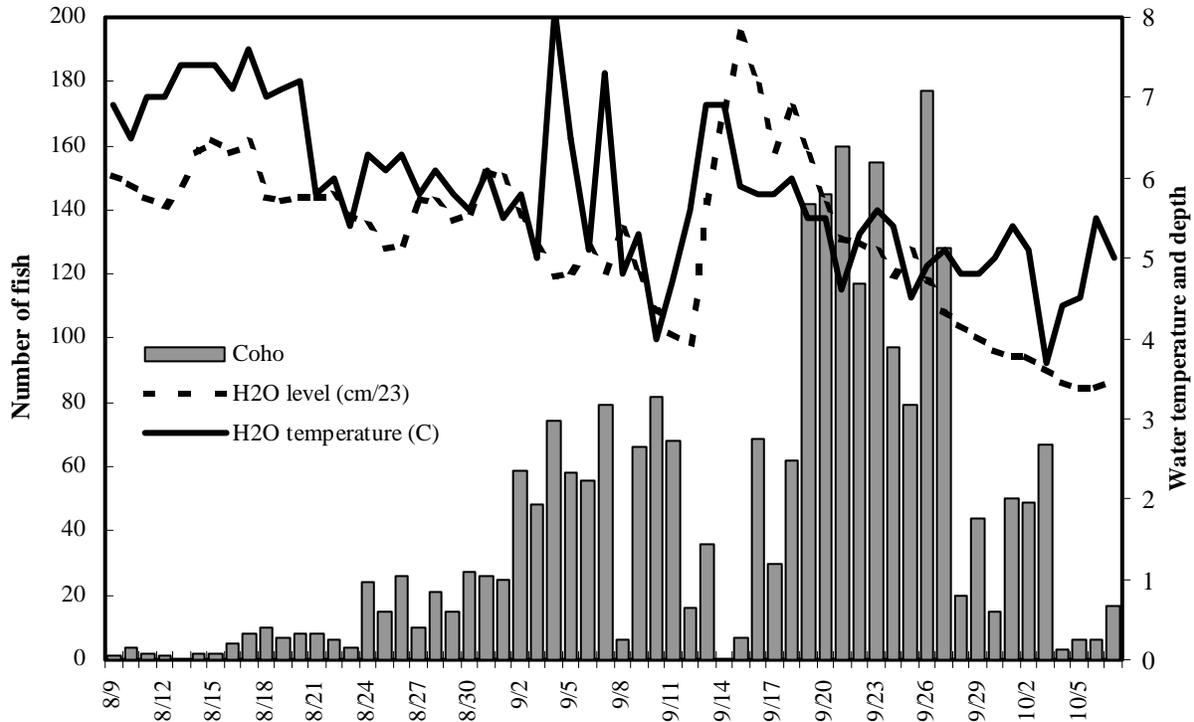


Figure 8.—Daily water depth (cm/23), temperature (°C), and fish wheel catch of adult coho salmon in the lower Chilkat River, August 9 through October 7, 2001.

River subsistence fisheries, and 2,270 (SE = 463) in Haines area recreational fisheries for a total harvest of 48,043 (SE = 4,566, Table 8). Most of the harvest (63.7%; 30,624, SE = 3,941) occurred in the commercial troll fisheries (Table 8), followed by the Lynn Canal drift gillnet fishery (28.5%; 13,709, SE = 2,213). The remainder of the harvest occurred in the recreational (6.1%), commercial seine (1.4%), and subsistence (0.3%) fisheries (Table 8). Harvests in the troll fisheries occurred earlier and over a longer period than in the other fisheries. Harvests in the troll fisheries occurred from early July through the third week of September (Figure 10). In contrast, the harvest in the drift gillnet fishery occurred from mid August through the first week of October, and in the purse seine and Juneau sport fisheries from early August to early September (Figure 10). The estimated mean date of harvest in the Northwest quadrant troll fishery was August 29, compared to September 17 for the Lynn Canal gillnet fishery.

The marked fraction θ_h germane to estimating harvest contributions was 0.0203 (SE = 0.0029).

This estimate is based on fish with decoded tags that were marked (48) by a code of interest and the 2,369 1-ocean adult coho salmon inspected for marks in 2001.

DATA FILES

Data collected during this study (Appendix A4) have been archived in ADF&G offices in Haines, Douglas, and Anchorage.

DISCUSSION

Several assumptions, as noted above, underlie our estimate of smolt abundance. It is unlikely that every smolt had an equal chance of being marked because trapping effort varied by area over the emigration (Table 1). In addition, coho smolt captured and marked from the upper Chilkat River sites were clearly different in size from those marked in the lower river. However, sampling effort for adults in the fish wheels was relatively constant over time, tending to equalize probability of capture during the

Table 4.—Number of adult coho salmon sampled in the Chilkat River fish wheels for missing adipose fins and coded wire tags, 2001.

Statistical week	Coho salmon			Tag location and code						Total ad clips	Percent marked
	0-ocean	1-ocean	Total	1999 code	Lower	Lower	Upper river		No tag		
					mainstem	tributaries	04-03-61 ^a	04-03-62 ^b			
				04-01-23	04-02-61	04-02-60					
32	0	7	7							0	
33	4	23	27							0	0.0
34	8	64	72							0	0.0
35	5	145	150				1	1		2	1.4
36	30	345	375		1	1	4			6	1.7
37	20	253	273		3	1	1		1	6	2.4
38	51	661	712	1	8	6	4		1	20	3.0
39	29	664	693	1	6	4	1		1	13	2.0
40	4	190	194		1	2	1		1	5	2.6
41	0	17	17							0	0.0
Total	151	2,369	2,520	2	19	14	12	1	4	52	2.2

^a This tag code was used primarily to tag coho salmon smolt in the upper river. However, about 28% of the fish tagged on this code were from the lower mainstem (Table 1).

^b This tag code was used to tag chinook salmon smolt in 2000.

Table 5.—Estimated age and size composition of coho salmon captured in the Chilkat River fish wheels, 2001.

	Brood year and age class			Total aged	Total sampled ^a
	1998 2.0	1998 1.1	1997 2.1		
Females					
Sample size	0	400	125	525	632
Percent		76.2	23.8		49.5
SE		1.9	1.9		1.4
Mean length		620	662		
SE		3	4		
Males					
Sample size	10	425	122	557	645
Percent	1.8	76.3	21.9		50.5
SE	0.6	1.8	1.8		1.4
Mean length	342	574	626		
SE	12	5	10		
All fish^b					
Sample size	10	828	248	1,086	1,277
Percent	0.9	76.2	22.8		
SE	0.3	1.3	1.3		
Mean length	342	596	644		
SE	12	3	5		

^a Includes fish that were not assigned an age.

^b Includes fish that were not sexed.

second sampling event. Also, the marked fraction of fish captured in the fish wheels varied very little between the first (prior to statistical week 39) and second half of the run (Table 4; $\chi^2 = 0.106$, $df = 1$, $P = 0.745$). This suggests that marked and unmarked fish mixed completely between sampling events, thus acting to satisfy assumption a. While the population in this experiment was not closed to losses from mortality, it was closed to recruitment (assumption b), because salmon return to their natal stream to spawn. Because different capture gear was used during the first and second sampling events, it is unlikely that marking affected the catchability of fish (assumption c). Other studies have shown that marked coho smolt do not have significantly higher mortality than unmarked fish (Elliott and Sterritt 1990; Vincent-Lang 1993). Because all fish had secondary marks that were not lost, assumption (d) was satisfied. Personnel sampling the fish wheels carefully examined each fish for marks; therefore failure of assumption (e) was unlikely.

One experimental difficulty experienced during this study was that some marked fish held over another year in fresh water. During our first day of tagging in 2001, we examined 434 smolt from

Table 6.–Random recoveries of CWTs from Chilkat River coho salmon by tag code, fishery, and statistical week, 2001.

Statistical week	Dates	Tag code					Total	
		04-01-23 ^a	04-01-34 ^a	04-02-60	04-02-61	04-02-62 ^b		04-03-61
District 115 Gillnet Fishery								
33	08/12–08/18				1		1	
35	08/26–09/01		1		1		2	
36	09/02–09/08			4	4		10	
37	09/09–09/15				2		3	
38	09/16–09/22			6	10		22	
39	09/23–09/29			3	9		13	
40	09/30–10/06			0	1		1	
Gillnet subtotal		0	1	13	28	0	10	52
Northwest Quadrant Troll								
27	07/01–07/07						1	1
28	07/08–07/14						1	1
29	07/15–07/21			2	8	1	1	12
30	07/22–07/28		1	2	3		4	10
31	07/29–08/04		1	3	1		6	11
32	08/05–08/11			2	4		4	10
33	08/12–08/18			4	2		3	9
34	08/19–08/25			5	6		5	16
35	08/26–09/01			5	9		20	34
36	09/02–09/08	1		9	9		5	24
37	09/09–09/15			9	10		9	28
38	09/16–09/22	2		8	14		5	29
NW troll subtotal		3	2	49	66	1	64	185
Northeast Quadrant Troll								
37	09/09–09/15				1		3	4
NE troll subtotal		0	0	0	1	0	3	4
Sitka Marine Sport Fishery								
33	08/12–08/18	1						1
Juneau Marine Sport Fishery								
34	08/19–08/25						2	2
35	08/26–09/01			1				1
36	09/02–09/08				1			1
Marine sport subtotal		1	0	1	1	0	2	5
District 109 Purse Seine Fishery								
32	08/05–08/11						1	1
District 112 Purse Seine Fishery								
31	07/29–08/04				1			1
33	08/12–08/18						2	2
34	08/19–08/25			1				1
Purse seine subtotal		0	0	1	1	0	3	5
Total recoveries		4	3	64	97	1	82	251
Valid tags released		10,029	1,998	9,960	10,756		4,276	
Percent gillnet		0.0	33.3	20.3	28.9	0.0	12.2	20.7
Percent troll		75.0	66.7	76.6	69.1	100.0	81.7	75.3
Percent gillnet & troll		75.0	100.0	96.9	97.9	100.0	93.9	96.0

^a These tag codes were used to tag coho salmon in 1999.

^b This tag code was used to tag chinook salmon smolt in 2000.

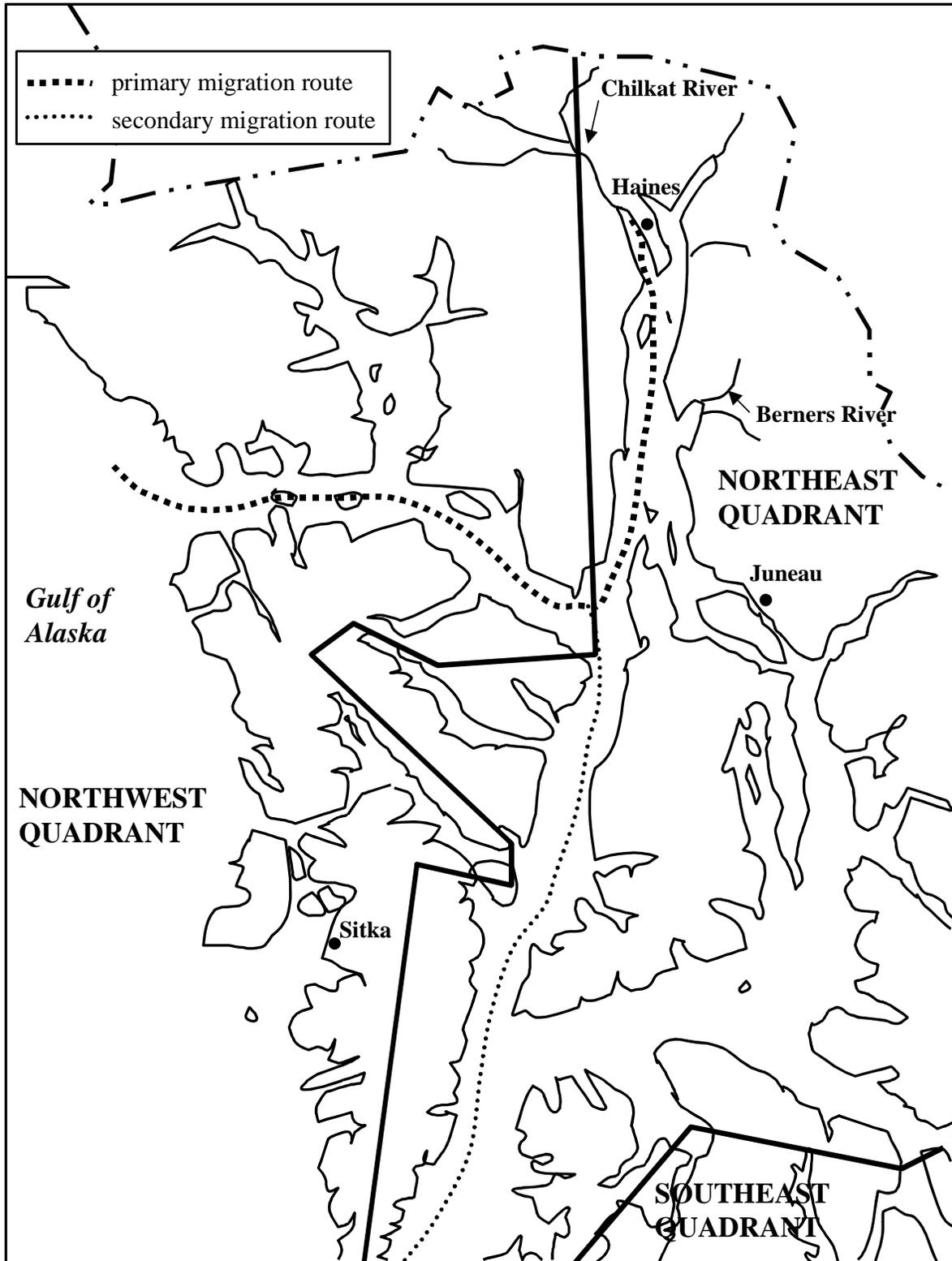


Figure 9.—Commercial troll quadrants and inside fishing districts in, and migration routes of Chilkat River coho salmon through northern Southeast Alaska.

Table 7.—Estimated marine harvest of adult coho salmon bound for the Chilkat River (r) with sampling statistics, by fishery and temporal stratum, 2001. [*n* = subset of the harvest (*H*) in each stratum inspected for CWTs; *a* = subset of *n* missing adipose fins; *a'* = subset *a* for which heads reach the laboratory; *t* = subset of *a'* with CWTs detected at the laboratory; *t'* = subset of *t* for which CWTs are decoded; *m_c* = number of decoded CWTs from the Chilkat River.]

Fishery	Dis- trict	Stat. week ^a	<i>H</i>	v[<i>H</i>]	<i>n</i>	<i>a</i>	<i>a'</i>	<i>t</i>	<i>t'</i>	<i>m_c</i>	<i>r</i>	SE[<i>r</i>]
Lynn Canal gillnet	115	33,34	1,068	0	112	3	3	3	3	1	471	470
Lynn Canal gillnet	115	35	1,789	0	148	5	5	4	4	2	1,193	852
Lynn Canal gillnet	115	36	6,312	0	1,067	27	27	26	26	10	2,920	1,003
Lynn Canal gillnet	115	37	6,124	0	629	35	34	32	32	3	1,484	873
Lynn Canal gillnet	115	38	5,448	0	1,381	36	34	34	33	22	4,673	1,189
Lynn Canal gillnet	115	39	6,960	0	1,712	71	70	70	69	13	2,684	829
Lynn Canal gillnet	115	40	5,327	0	989	76	71	68	68	1	285	284
Lynn Canal gillnet subtotal			33,028	0	6,038	253	244	237	235	52	13,709	2,213
NW troll period 3		27-32	828,146	0	201,968	3,821	3,802	3,199	3,192	45	9,172	1,882
NW troll period 4		33-38	432,752	0	144,857	3,368	3,338	2,926	2,923	140	20,849	3,449
NW troll subtotal			1,260,898	0	346,825	7,189	7,140	6,125	6,115	185	30,021	3,929
NE troll period 4		33-38	73,563	0	24,190	445	443	379	379	4	603	310
NE troll subtotal			73,563	0	24,190	445	443	379	379	4	603	310
Purse seine	109	32	9,660	0	2,163	33	33	29	29	1	220	220
Purse seine	112	31	6,555	0	2,124	51	45	38	38	1	173	172
Purse seine	112	33	2,284	0	1,817	68	68	63	63	2	124	88
Purse seine	112	34	10,297	0	3,263	89	89	73	73	1	156	155
Purse seine subtotal			28,796	0	9,367	241	235	203	203	5	673	331
Sitka marine sport	113	17	16,680	1,275,932	5,340	90	90	81	81	1	154	154
Sitka marine sport subtotal			16,680	1,275,932	5,340	90	90	81	81	1	154	154
Juneau marine sport	111,112	17	6,833	712,536	3,353	142	140	131	131	2	204	146
Juneau marine sport	112	18	3,276	333,278	1,240	62	55	53	53	2	294	212
Juneau marine sport subtotal			10,109	1,045,814	4,593	204	195	184	184	4	498	258
Total all fisheries			1,423,074	2,321,746	396,353	8,422	8,347	7,209	7,197	251	45,658	7,194

^a Statistical week except bi-week in the marine sport fisheries.

the Chilkat River and 1 (0.2%) had previously been tagged in 2000 (Appendix A3). If a significant number of marked fish held over, our smolt estimate is biased high. We will have a better idea on the magnitude of this problem after the 2002 adult return. In 2000, we raised the minimum tagging length from 70 to 75 mm. In 1999, 22% of the coho we marked were less than 75 mm (Figure 6). Raising the minimum length should have reduced the number of holdovers.

One coho salmon recovered in the NW troll fishery and another recovered in the Chilkat River fish wheels were mistakenly tagged with a

chinook salmon code (Table 6, Appendix A3). Chinook and coho salmon smolt are relatively similar in appearance. However, this does not appear to be a significant problem because so few fish were tagged with the chinook tag code and only two fish were recovered with the wrong code despite extensive sampling efforts.

Rotary smolt traps were used in the Chilkat River during 2000 to increase the catch of chinook salmon smolt. Although our numbers did improve from 1999, less than 2,000 were caught over the entire season (Table 1). The traps proved to be very high maintenance because of the amount of

Table 8.—Total coho salmon harvest and estimated Chilkat River coho salmon harvest in Alaska fisheries, by fishery and area, 2001.

Fishery	Area	Coho salmon harvest			Percent of harvest	
		Total	Chilkat	SE	Fishery ^a	Chilkat ^b
Drift gillnet	District 115	34,039	13,709	2,213	40.3	28.5
U.S. troll fishery	NW Quadrant	1,260,898	30,021	3,929	2.4	62.5
	NE Quadrant	218,221	603	310	0.3	1.2
	Subtotal	1,479,119	30,624	3,941	2.1	63.7
Seine fishery	District 109	59,753	220	220	0.4	0.5
	District 112	35,273	453	248	1.3	0.9
	Subtotal	95,026	673	331	0.7	1.4
Recreational	Sitka marine	78,218	154	154	0.2	0.3
	Juneau marine	16,036	498	258	3.1	1.0
	Haines marine ^c	176	165	108	93.8	0.4
	Chilkat River ^c	2,094	2,094	451	100.0	4.4
	Subtotal	96,524	2,911	552	3.0	6.1
Subsistence^d	Chilkat Inlet	44	44	0	100.0	0.1
	Chilkat River	82	82	0	100.0	0.2
	Subtotal	126	126	0	100.0	0.3
Total		1,704,834	48,038	4,566	2.8	100.0

^a Percent of Chilkat River coho salmon in the fishery harvest.

^b Percent of the Chilkat River coho salmon harvest by the fishery.

^c Bingham et al. (*In prep*).

^d Data taken from subsistence harvest reports (Division of Commercial Fisheries).

large debris in the river. As a result, a lot of time was spent keeping the traps running that could have been spent minnow trapping. I do not recommend the future use of rotary smolt traps in the Chilkat River.

The timing of the coho salmon escapement into the Chilkat River was very similar to the mean of other years when the fish wheels were operated into October (1990 and 1997–2000). The mean date of migratory timing in 2001 (Mundy 1984) was September 20. In contrast, the mean date for past years was September 21 (Figure 11).

The percent of Chilkat River coho salmon in the harvest varied greatly depending on the proximity of the fishery to the Chilkat River. Although we estimated that the NW troll fishery harvested the greatest number (30,021) of Chilkat River fish, they represented only 2.4% of this harvest (Table 8). The second largest harvest occurred in the

Lynn Canal drift gillnet fishery (13,709) where Chilkat River fish represented 40.3% of the total harvest. As one might expect, fisheries closer to the Chilkat River had a higher percent of Chilkat River fish in the harvest because the mixture of stocks become less.

The estimates of the total harvest of Chilkat River coho salmon in 2001 should be considered minimum, because not all fisheries were sampled or were not sampled at rates sufficient to detect small harvests. For example, many smaller marine sport fisheries (including those in Icy Straits) were not sampled for coded wire tags. Thus, the contribution of various stocks to these fisheries cannot be estimated.

The exploitation of coho salmon in the Lynn Canal commercial drift gillnet fishery was lower than normal. The price paid for a gillnet-caught coho salmon averaged \$0.35/lb over the season.

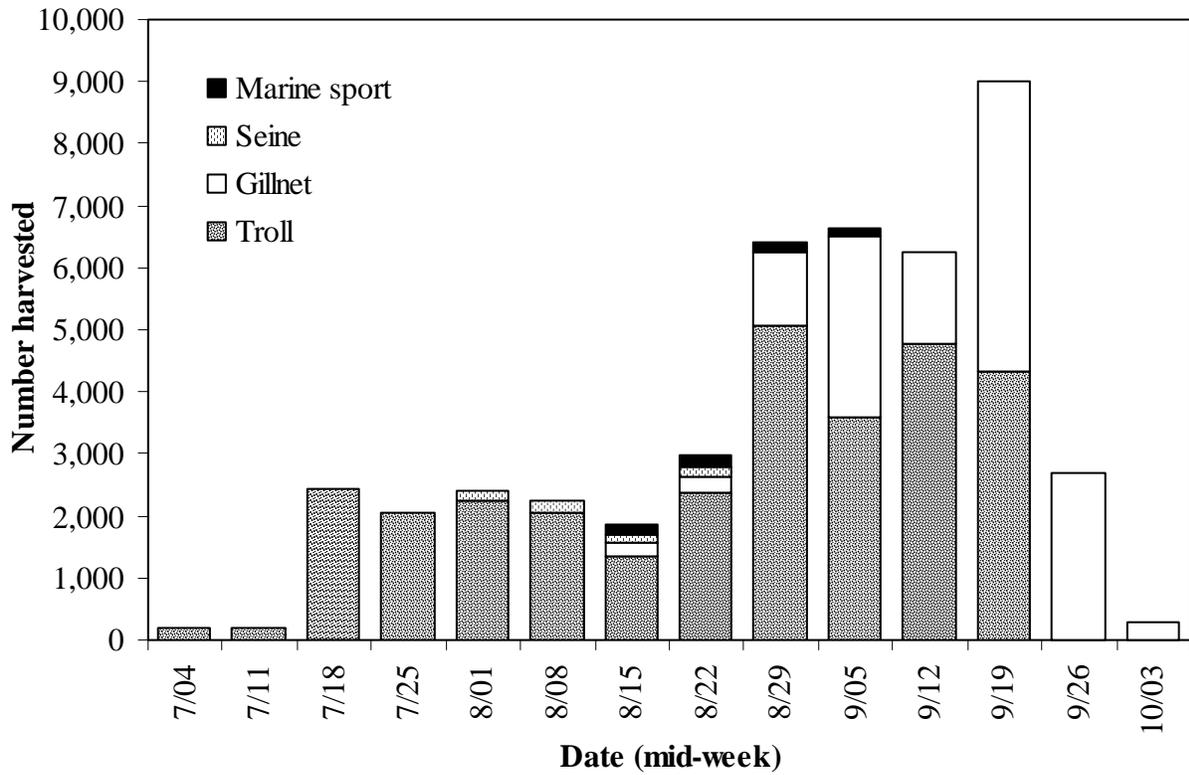


Figure 10.—Estimated marine harvests of coho salmon bound for the Chilkat River, by fishery and statistical week, 2001. Weekly estimates of harvest in the troll (period) and marine sport fisheries (biweek) are approximated.

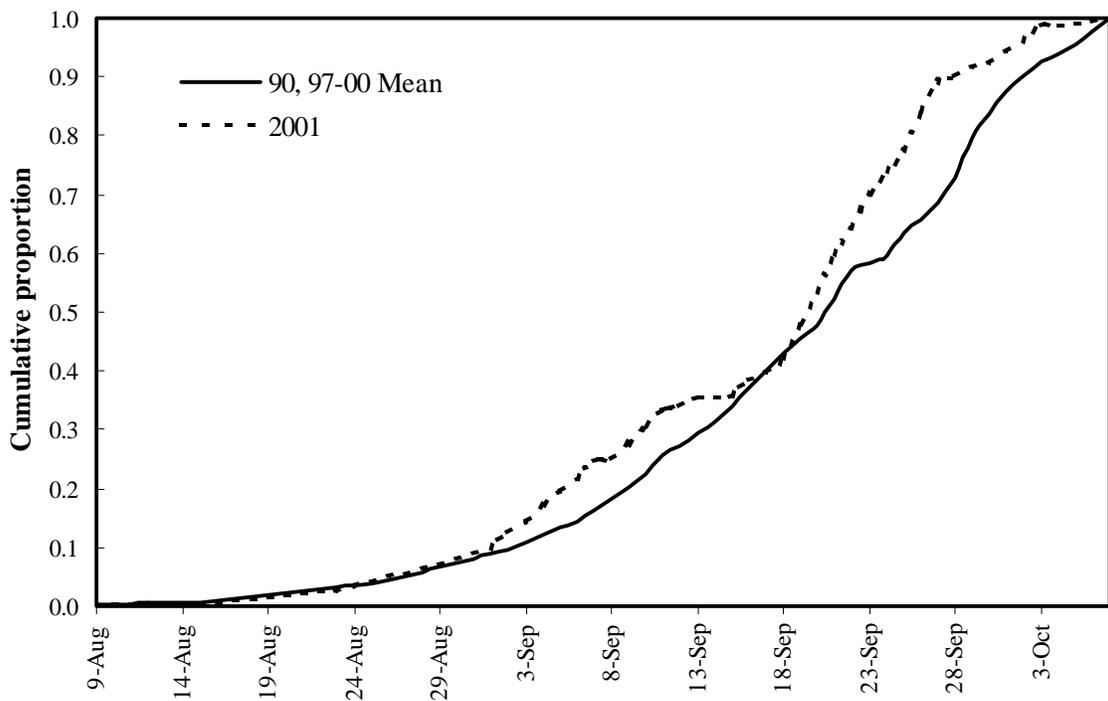


Figure 11.—Cumulative proportion of adult coho salmon captured in Chilkat River fish wheels during 2001 compared to the mean cumulative proportion of 1990, 1997, 1998, 1999 and 2000.

Table 9.–Peak number of coho salmon counted in spawning index tributaries of the Chilkat River, 1987–2001, compared to mark-recapture estimates for the entire drainage in 1990 and 1998.

	Peak surveys					M-R estimate	SE	Ratio
	Spring Creek	Kelsall River	Tahini River	Clear Creek	Combined			
1987	84	184	696	23	987			
1988	83	152	539	35	809			
1989	48	182	981	134	1,345			
1990	79	328	2,448	150	3,005	80,700	9,984	0.0372
1991	176	392	1,707	135	2,410			
1992	174	266	1,077	700	2,217			
1993	95	115	947	460	1,617			
1994	398	440	4,419	381	5,638			
1995	253	178	1,029	177	1,637			
1996	180	157	381	290	1,008			
1997	204	129	643	250	1,226			
1998	264	262	638	275	1,439	37,132	7,432	0.0388
1999	324	202	930	195	1,651			
2000	302	551	1,302	420	2,575			
2001	441	221	1,252	1,285	3,199			
Average	207	251	1,266	327	2,051	58,916		0.0380

This was the lowest average price paid for coho salmon in over 20 years. Many fishers stopped fishing later in the season rather than accept such a low price.

I recommend that we estimate escapement of coho salmon to the Chilkat River during two or more years when CWT tagged fish are returning. This would allow us to estimate marine survival, total run size, and exploitation rates for this stock. At the present time, escapement is monitored through the peak counts of spawning coho salmon in four index tributaries to the Chilkat River (Table 9). Two years of mark-recapture experiments suggest that the proportion of coho salmon counted in the peak index counts (0.0372–0.0388) is similar over time (Table 9). If this proportion held in 2001, about 84,000 coho salmon escaped into the Chilkat River and exploitation rate was about 36%. However, additional studies are needed to better validate these escapement indices. Estimating escapement during years when CWTs are coming back will complete the stock assessment program, provide added validation of the escapement indices, and enable us to develop better management tools for this stock.

ACKNOWLEDGMENTS

Steve McCurdy supervised the smolt tagging field operations and provided necessary logistical support. Patty Kermoian, Mark Battaion, Paula MacKenzie, Sandy Barclay, Jaime Barlow, Dave Folletti, Eric Holle, Betsy Wilson and Brian Elliott worked in the field to capture, mark, and sample smolt during the spring of 2000. John Norton, Scott Duffy, and Lou Cenicola captured and sampled adult coho salmon at the fish wheels during the fall of 2001. Tim Schantz provided technical advice on smolt trapping and tagging techniques. Sue Millard, Division of Sport Fish in Douglas, processed and aged scales from sampled coho salmon. Employees at the ADF&G Tag Lab in Juneau dissected heads from adipose finclipped coho salmon to remove and read coded wire tags. Bob Marshall with RTS in Douglas provided biometric support in the study design, and analysis. Bob Marshall and Scott McPherson provided critical review of this report. Alma Seward prepared the final layout and typesetting of this report for publication.

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APPENDIX A

Appendix A1.–Daily lower rotary smolt trap log with catch by species and type in the upper Chilkat River, 2000.

Date	Chinook		Coho		Sockeye		Dolly Varden				Cut-throat	Stickle-back	White-Sculpin	Lam-fish	Lam-prey	Comments
	Smolt	Parr	Smolt	Parr	Smolt	Parr	Pink	Chum	Large	Small						
04/30	9					3	3	1				3		3		Trap started at 18:00
05/01	60	1	5	3		55	17			2	2		1	1		Spinning in a.m. Debris drum working poorly.
05/02	46		13	15		10	15			3	1	25			1	Spinning in a.m. Debris drum not working.
05/03	34	52	6	14	40	50	40			2		16				Spinning in a.m. Debris drum not working.
05/04	9	30	3	15		20	25			1						Not spinning in a.m. (log). Trap not fished after morning check.
05/05		4														Not fished overnight. Trap started again at 15:15.
05/06	32	7	19	3		2	3	1	1	3	3	63	1			Spinning in a.m. Debris drum working fine.
05/07	15	2	3	6		2	8			1	1	6	2			Not spinning in a.m. (log). Trap not fished for ~ 2 hs. mid day.
05/08	36	8	14	5	3	47	7					9	2			Not spinning in a.m. (log).
05/09	119	11	50						1		2					Spinning in a.m.
05/10	52		35		9					5	1	19			2	Not spinning in a.m. (debris).
05/11	33	3	3	5	28		3				2	36	2			Not spinning in a.m. (debris).
05/12	49	40	21	20	40	30	14	20		1	1	35				Debris drum not turning, box overflowing (not fish tight).
05/13	42	15	71	30		40	5	2	1	2	1	60	5			Not spinning in a.m. (debris). Not fished 13:00 to 21:30.
05/14	26	2	55	4		6						15	5			Not spinning in a.m. (log). Trap not fished during the day.
05/15	27	5	55	5		11	1					19	3	2		Spinning in a.m. Trap not fished during the day.
05/16	24	1	36		4					2		35				Not spinning in a.m. Trap not fished during the day.
05/17	33		65			4				2		20				Spinning in a.m. Trap not fished during the day.
05/18	15	3	49	5		30	3	3		2		8	1			Not spinning in a.m. Trap not fished from 17:00 to 22:00.
05/19	1		2			25										Not fished overnight.
05/20	15		39			15						8	1			Not spinning in a.m.
05/21	13		43				35			1		10	1			Spinning in a.m.
05/22	9	35	24	25		10	10	15				15				Spinning in a.m.
05/23	5	30	35	15						2		10				Spinning in a.m.
05/24	1	25	24	60		3	7			1		5				Spinning in a.m.
05/25	4		28													Spinning in a.m.
05/26	3		19													Not spinning in a.m. (log).
Total	712	274	717	230	124	363	196	42	3	30	14	417	24	4	5	

Appendix A2.–Daily upper rotary smolt trap log with catch by species and type in the upper Chilkat River, 2000.

Date	Chinook		Coho		Sockeye		Pink	Chum	Dolly Varden		Cut-throat	Stickle-back	Sculpin	White-fish		Lamprey	Comments
	Smolt	Parr	Smolt	Parr	Smolt	Parr			Large	Small				fish	Lamprey		
05/06	2	2		3		2	1				1	5					Started at 16:00. Working poorly.
05/07	1		3				2				1	1					Box not fish tight
05/08	13		7									5					Fishing in slow current.
05/09	19		11	2		30	3					5					Moved trap to better location 13:45.
05/10	17		17	6		115	34		1	4	1	10	3				Not turning in a.m. (debris).
05/11	28		5	9	15	10	11			3	2	9	12				Turning in a.m.
05/12	43	60	19	75		105	26	15				46				1	Turning in a.m.
05/13	25	15	34	18		55	6	5			1	55	3				Turning in a.m.
05/14	5	3	47	8	2	12						8	3				Turning in a.m., not fished during day.
05/15	15	2	27		8	8						12	2			1	Turning in a.m., not fished during day.
05/16	7	7	10	7		20	2					8					Turning in a.m., not fished during day.
05/17	5	12	14	16		24	2	2		3		27					Turning in a.m., not fished during day.
05/18	9	9	28	9		18	4			2	1	4	2				Not turning in a.m. Fished all day.
05/19	4		4			12					1	2		1			Not turning in a.m.
05/20	12		59			20				1		4					Not turning in a.m.
05/21	13		28				15			1		6					Turning in a.m.
05/22	2	45	13	50		10	5		10			10					Turning in a.m.
05/23	10	30	61	20		2	3	10			2	20					Turning in a.m.
05/24	2	30	47	50	1	4	5			1		10					Turning in a.m.
05/25	7		34														Turning in a.m.
05/26			3														Not turning in a.m. Quit fishing @ 7:00 a.m..
Total	239	215	471	273	26	447	119	32	11	15	10	247	25	1		2	

Appendix A3.–Random, select, and voluntary recoveries of coho salmon that were coded wire tagged during spring, 2000.

Head number	Tag code	Gear	Port	Recovery date	Stat. week	Quad-rant	District	Sub-dist.	Length
RANDOM RECOVERIES									
504659	40261	Gillnet	Petersburg	8/16/2001	33	NE	115	10	511
25353	40134	Gillnet	Excursion Inlet	8/29/2001	35	NE	115		651
25352	40261	Gillnet	Excursion Inlet	8/29/2001	35	NE	115		831
25952	40260	Gillnet	Excursion Inlet	9/5/2001	36	NE	115		531
71056	40260	Gillnet	Excursion Inlet	9/5/2001	36	NE	115		728
71055	40260	Gillnet	Excursion Inlet	9/5/2001	36	NE	115		748
71059	40260	Gillnet	Excursion Inlet	9/5/2001	36	NE	115		823
25951	40261	Gillnet	Excursion Inlet	9/5/2001	36	NE	115		604
71070	40261	Gillnet	Excursion Inlet	9/5/2001	36	NE	115		652
71069	40261	Gillnet	Excursion Inlet	9/5/2001	36	NE	115		670
71060	40261	Gillnet	Excursion Inlet	9/5/2001	36	NE	115		814
71064	40361	Gillnet	Excursion Inlet	9/5/2001	36	NE	115		685
71066	40361	Gillnet	Excursion Inlet	9/5/2001	36	NE	115		776
71138	40261	Gillnet	Excursion Inlet	9/11/2001	37	NE	115		612
71135	40261	Gillnet	Excursion Inlet	9/11/2001	37	NE	115		651
71136	40361	Gillnet	Excursion Inlet	9/11/2001	37	NE	115		707
512838	40260	Gillnet	Juneau	9/18/2001	38	NE	115		695
512841	40260	Gillnet	Juneau	9/18/2001	38	NE	115		724
512828	40261	Gillnet	Juneau	9/18/2001	38	NE	115		618
512836	40261	Gillnet	Juneau	9/18/2001	38	NE	115		624
512833	40261	Gillnet	Juneau	9/18/2001	38	NE	115		682
512832	40361	Gillnet	Juneau	9/18/2001	38	NE	115		672
512894	40260	Gillnet	Juneau	9/19/2001	38	NE	115		609
512882	40260	Gillnet	Juneau	9/19/2001	38	NE	115		612
512881	40260	Gillnet	Juneau	9/19/2001	38	NE	115		718
512880	40260	Gillnet	Juneau	9/19/2001	38	NE	115		741
512889	40261	Gillnet	Juneau	9/19/2001	38	NE	115		616
512887	40261	Gillnet	Juneau	9/19/2001	38	NE	115		646
512876	40261	Gillnet	Juneau	9/19/2001	38	NE	115		714
512884	40261	Gillnet	Juneau	9/19/2001	38	NE	115		742
512888	40261	Gillnet	Juneau	9/19/2001	38	NE	115		743
512878	40261	Gillnet	Juneau	9/19/2001	38	NE	115		749
512982	40261	Gillnet	Juneau	9/19/2001	38	NE			698
512877	40361	Gillnet	Juneau	9/19/2001	38	NE	115		622
512883	40361	Gillnet	Juneau	9/19/2001	38	NE	115		690
512891	40361	Gillnet	Juneau	9/19/2001	38	NE	115		761
512874	40361	Gillnet	Juneau	9/19/2001	38	NE	115		761
512885	40361	Gillnet	Juneau	9/19/2001	38	NE	115		776
88152	40260	Gillnet	Juneau	9/25/2001	39	NE	115		658
88143	40260	Gillnet	Juneau	9/25/2001	39	NE	115		696
88147	40260	Gillnet	Juneau	9/25/2001	39	NE	115		752
88119	40261	Gillnet	Juneau	9/25/2001	39	NE	115		615
88107	40261	Gillnet	Juneau	9/25/2001	39	NE	115		617
88131	40261	Gillnet	Juneau	9/25/2001	39	NE	115		629
88141	40261	Gillnet	Juneau	9/25/2001	39	NE	115		676
88165	40261	Gillnet	Juneau	9/25/2001	39	NE	115		714
88149	40261	Gillnet	Juneau	9/25/2001	39	NE	115		719
88142	40261	Gillnet	Juneau	9/25/2001	39	NE	115		756
88139	40261	Gillnet	Juneau	9/25/2001	39	NE	115		773
88153	40261	Gillnet	Juneau	9/25/2001	39	NE	115		805
88145	40361	Gillnet	Juneau	9/25/2001	39	NE	115		644

-continued-

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Head number	Tag code	Gear	Port	Recovery date	Stat. week	Quad-rant	District	Sub-dist.	Length
88180	40261	Gillnet	Juneau	10/2/2001	40	NE	115		690
14813	40261	Seine	Excursion Inlet	8/3/2001	31	NE	112		615
14826	40361	Seine	Excursion Inlet	8/6/2001	32	NE	109	51	483
479	40361	Seine	Excursion Inlet	8/15/2001	33	NE	112		471
1497	40361	Seine	Excursion Inlet	8/16/2001	33	NE	112		759
5612	40260	Seine	Excursion Inlet	8/20/2001	34	NE	112		612
149484	40123	Sport	Sitka	8/14/2001	33	NW	113	45	720
189159	40361	Sport	Juneau	8/21/2001	34	NE			710
84247	40361	Sport	Juneau	8/25/2001	34	NE	112	16	620
84042	40260	Sport	Juneau	8/31/2001	35	NE	111	50	730
84052	40261	Sport	Juneau	9/8/2001	36	NE	112	15	760
190307	40361	Troll	Hoonah	7/5/2001	27	NW	113		675
190569	40361	Troll	Hoonah	7/14/2001	28	NW	116	11	710
3788	40261	Troll	Excursion Inlet	7/15/2001	29	NW			503
4712	40261	Troll	Excursion Inlet	7/15/2001	29	NW			545
3773	40261	Troll	Excursion Inlet	7/15/2001	29	NW			583
4713	40261	Troll	Excursion Inlet	7/15/2001	29	NW			590
153405	40260	Troll	Sitka	7/15/2001	29	NW	113	22	587
192225	40261	Troll	Pelican	7/16/2001	29	NW	113	91	558
192252	40261	Troll	Pelican	7/17/2001	29	NW	113	91	607
190604	40260	Troll	Hoonah	7/18/2001	29	NW	113		710
192261	40262	Troll	Pelican	7/18/2001	29	NW			520
17918	40261	Troll	Excursion Inlet	7/19/2001	29	NW			610
17924	40361	Troll	Excursion Inlet	7/19/2001	29	NW			600
192273	40261	Troll	Pelican	7/19/2001	29	NW	113	91	622
3822	40261	Troll	Excursion Inlet	7/22/2001	30	NW			663
192334	40261	Troll	Pelican	7/22/2001	30	NW	114	21	619
151563	40261	Troll	Sitka	7/23/2001	30	NW	113		581
189741	40260	Troll	Elfin Cove	7/24/2001	30	NW	114	21	527
189772	40361	Troll	Elfin Cove	7/26/2001	30	NW	114	21	692
189771	40361	Troll	Elfin Cove	7/26/2001	30	NW	114	21	810
1916	40134	Troll	Excursion Inlet	7/27/2001	30	NW			565
1934	40361	Troll	Excursion Inlet	7/27/2001	30	NW			610
190767	40260	Troll	Hoonah	7/27/2001	30	NW	113	91	680
190824	40361	Troll	Hoonah	7/28/2001	30	NW	113		715
192442	40260	Troll	Pelican	7/30/2001	31	NW	116	12	625
192451	40361	Troll	Pelican	7/30/2001	31	NW	116	12	647
189779	40261	Troll	Elfin Cove	7/31/2001	31	NW	114	21	620
1874	40260	Troll	Excursion Inlet	7/31/2001	31	NW			748
1884	40361	Troll	Excursion Inlet	7/31/2001	31	NW			452
1871	40361	Troll	Excursion Inlet	7/31/2001	31	NW			702
192541	40134	Troll	Pelican	7/31/2001	31	NW			757
192537	40260	Troll	Pelican	7/31/2001	31	NW			635
192509	40361	Troll	Pelican	7/31/2001	31	NW	113	81	625
1835	40361	Troll	Excursion Inlet	8/2/2001	31	NW			705
190920	40361	Troll	Hoonah	8/3/2001	31	NW	114	23	725
190988	40260	Troll	Hoonah	8/5/2001	32	NW	113		775
190978	40261	Troll	Hoonah	8/5/2001	32	NW	113		645
14859	40361	Troll	Excursion Inlet	8/6/2001	32	NW			638
192624	40261	Troll	Pelican	8/6/2001	32	NW	116	12	681
192627	40361	Troll	Pelican	8/6/2001	32	NW	116	12	666
190998	40361	Troll	Hoonah	8/7/2001	32	NW	114		520
14888	40261	Troll	Excursion Inlet	8/6/2001	32	NW			506

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Head number	Tag code	Gear	Port	Recovery date	Stat. week	Quad-rant	District	Sub-dist.	Length
192660	40260	Troll	Pelican	8/7/2001	32	NW	116	12	614
28749	40361	Troll	Excursion Inlet	8/8/2001	32	NW			742
204038	40261	Troll	Elfin Cove	8/10/2001	32	NW	114	21	628
204054	40361	Troll	Elfin Cove	8/12/2001	33	NW	114	21	584
192726	40261	Troll	Pelican	8/12/2001	33	NW			581
192727	40361	Troll	Pelican	8/12/2001	33	NW			632
204069	40361	Troll	Elfin Cove	8/13/2001	33	NW	114	21	760
191098	40260	Troll	Hoonah	8/13/2001	33	NW	113	91	625
152617	40261	Troll	Sitka	8/13/2001	33	NW			545
1477	40260	Troll	Excursion Inlet	8/14/2001	33	NW			624
1479	40260	Troll	Excursion Inlet	8/14/2001	33	NW			756
192817	40260	Troll	Pelican	8/14/2001	33	NW	116	12	660
191141	40260	Troll	Hoonah	8/19/2001	34	NW	113		710
5684	40261	Troll	Excursion Inlet	8/20/2001	34	NW			681
5695	40361	Troll	Excursion Inlet	8/20/2001	34	NW			716
192879	40261	Troll	Pelican	8/20/2001	34	NW			662
204100	40261	Troll	Elfin Cove	8/21/2001	34	NW	114	21	630
206903	40361	Troll	Elfin Cove	8/21/2001	34	NW	114	21	660
187886	40260	Troll	Sitka	8/21/2001	34	NW	113	81	664
5645	40261	Troll	Excursion Inlet	8/23/2001	34	NW			589
5647	40261	Troll	Excursion Inlet	8/23/2001	34	NW			688
5736	40261	Troll	Excursion Inlet	8/23/2001	34	NW			804
5720	40361	Troll	Excursion Inlet	8/23/2001	34	NW			684
192952	40260	Troll	Pelican	8/23/2001	34	NW	113	91	532
192918	40260	Troll	Pelican	8/23/2001	34	NW			648
192937	40361	Troll	Pelican	8/23/2001	34	NW	113		720
191271	40260	Troll	Hoonah	8/24/2001	34	NW	113	95	710
191256	40361	Troll	Hoonah	8/24/2001	34	NW	114	25	720
193181	40361	Troll	Pelican	8/26/2001	35	NW			678
206931	40361	Troll	Elfin Cove	8/27/2001	35	NW	114	21	505
191324	40261	Troll	Hoonah	8/27/2001	35	NW	114	25	565
25743	40260	Troll	Excursion Inlet	8/28/2001	35	NW			629
24573	40260	Troll	Excursion Inlet	8/28/2001	35	NW			743
25747	40260	Troll	Excursion Inlet	8/28/2001	35	NW			757
24577	40261	Troll	Excursion Inlet	8/28/2001	35	NW			558
25745	40361	Troll	Excursion Inlet	8/28/2001	35	NW			616
24551	40361	Troll	Excursion Inlet	8/28/2001	35	NW			714
193264	40361	Troll	Pelican	8/28/2001	35	NW	113	91	452
193272	40261	Troll	Pelican	8/29/2001	35	NW	114	21	553
25358	40261	Troll	Excursion Inlet	8/30/2001	35	NW			580
25859	40261	Troll	Excursion Inlet	8/30/2001	35	NW			665
25371	40361	Troll	Excursion Inlet	8/30/2001	35	NW			601
25364	40361	Troll	Excursion Inlet	8/30/2001	35	NW			616
25386	40361	Troll	Excursion Inlet	8/30/2001	35	NW			651
25373	40361	Troll	Excursion Inlet	8/30/2001	35	NW			664
25367	40361	Troll	Excursion Inlet	8/30/2001	35	NW			791
191403	40260	Troll	Hoonah	8/30/2001	35	NW			675
191436	40261	Troll	Hoonah	8/30/2001	35	NW			610
191398	40361	Troll	Hoonah	8/30/2001	35	NW	114	25	760
191404	40361	Troll	Hoonah	8/30/2001	35	NW			640
191429	40261	Troll	Hoonah	8/31/2001	35	NW	114	23	670
191437	40361	Troll	Hoonah	8/31/2001	35	NW	114	23	675
191427	40361	Troll	Hoonah	8/31/2001	35	NW	114	23	820

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Head number	Tag code	Gear	Port	Recovery date	Stat. week	Quad-rant	District	Sub-dist.	Length
191443	40361	Troll	Hoonah	8/31/2001	35	NW	114	27	755
23817	40260	Troll	Excursion Inlet	9/1/2001	35	NW			590
23835	40261	Troll	Excursion Inlet	9/1/2001	35	NW			625
25674	40361	Troll	Excursion Inlet	9/1/2001	35	NW			630
23815	40361	Troll	Excursion Inlet	9/1/2001	35	NW			671
25695	40361	Troll	Excursion Inlet	9/1/2001	35	NW			677
23850	40361	Troll	Excursion Inlet	9/1/2001	35	NW			682
25896	40361	Troll	Excursion Inlet	9/1/2001	35	NW			727
193461	40261	Troll	Pelican	9/1/2001	35	NW	113	91	680
24541	40261	Troll	Excursion Inlet	9/3/2001	36	NW			635
23939	40361	Troll	Excursion Inlet	9/3/2001	36	NW			682
23986	40361	Troll	Excursion Inlet	9/3/2001	36	NW			734
191467	40260	Troll	Hoonah	9/3/2001	36	NW	114	21	575
191500	40260	Troll	Hoonah	9/3/2001	36	NW			605
191508	40261	Troll	Hoonah	9/3/2001	36	NW			665
191469	40361	Troll	Hoonah	9/3/2001	36	NW	114	21	700
191485	40261	Troll	Hoonah	9/4/2001	36	NW	114	25	645
191511	40361	Troll	Hoonah	9/4/2001	36	NW	114		740
25980	40123	Troll	Excursion Inlet	9/5/2001	36	NW			720
25988	40260	Troll	Excursion Inlet	9/5/2001	36	NW			676
25968	40260	Troll	Excursion Inlet	9/5/2001	36	NW			691
25976	40260	Troll	Excursion Inlet	9/5/2001	36	NW			720
71008	40260	Troll	Excursion Inlet	9/5/2001	36	NW			771
71007	40261	Troll	Excursion Inlet	9/5/2001	36	NW			630
25998	40261	Troll	Excursion Inlet	9/5/2001	36	NW			644
71033	40261	Troll	Excursion Inlet	9/5/2001	36	NW			682
25990	40261	Troll	Excursion Inlet	9/5/2001	36	NW			730
191579	40260	Troll	Hoonah	9/5/2001	36	NW			575
191586	40260	Troll	Hoonah	9/7/2001	36	NW	114	25	695
191595	40261	Troll	Hoonah	9/7/2001	36	NW	113	95	665
191667	40260	Troll	Hoonah	9/8/2001	36	NW			745
191643	40261	Troll	Hoonah	9/8/2001	36	NW			655
191656	40361	Troll	Hoonah	9/8/2001	36	NW			730
71121	40260	Troll	Excursion Inlet	9/9/2001	37	NW			731
71122	40361	Troll	Excursion Inlet	9/9/2001	37	NW			770
191605	40261	Troll	Hoonah	9/9/2001	37	NW	114	25	560
191609	40261	Troll	Hoonah	9/9/2001	37	NW	114	25	720
191602	40361	Troll	Hoonah	9/9/2001	37	NW	114	21	760
191612	40361	Troll	Hoonah	9/9/2001	37	NW	114	23	650
191615	40361	Troll	Hoonah	9/9/2001	37	NW	114	25	715
191617	40261	Troll	Hoonah	9/9/2001	37	NE	112	63	655
191630	40361	Troll	Hoonah	9/9/2001	37	NE	112	63	670
206976	40260	Troll	Elfin Cove	9/10/2001	37	NW	114	21	675
191633	40261	Troll	Hoonah	9/10/2001	37	NW	114		710
206981	40260	Troll	Elfin Cove	9/11/2001	37	NW	114	21	740
191711	40260	Troll	Hoonah	9/11/2001	37	NW	114	25	575
191722	40261	Troll	Hoonah	9/11/2001	37	NW	114	25	720
193605	40260	Troll	Pelican	9/11/2001	37	NW	114	21	730
193575	40260	Troll	Pelican	9/11/2001	37	NW			712
193579	40261	Troll	Pelican	9/11/2001	37	NW	113	91	538
191724	40261	Troll	Hoonah	9/12/2001	37	NW	114	23	700
191723	40361	Troll	Hoonah	9/12/2001	37	NW	114	23	605
193615	40260	Troll	Pelican	9/12/2001	37	NW			677

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Head number	Tag code	Gear	Port	Recovery date	Stat. week	Quad-rant	District	Sub-dist.	Length
191691	40361	Troll	Hoonah	9/10/2001	37	NW	114	25	585
191634	40361	Troll	Hoonah	9/10/2001	37	NW	114		650
193554	40261	Troll	Pelican	9/10/2001	37	NW			690
191675	40361	Troll	Hoonah	9/10/2001	37	NE	112	63	605
191677	40361	Troll	Hoonah	9/10/2001	37	NE	112	63	655
193644	40361	Troll	Pelican	9/12/2001	37	NW	114	21	704
71174	40260	Troll	Excursion Inlet	9/13/2001	37	NW			612
71162	40260	Troll	Excursion Inlet	9/13/2001	37	NW			691
71166	40261	Troll	Excursion Inlet	9/13/2001	37	NW			749
71147	40261	Troll	Excursion Inlet	9/13/2001	37	NW			774
71177	40361	Troll	Excursion Inlet	9/13/2001	37	NW			770
193678	40261	Troll	Pelican	9/13/2001	37	NW	113	91	478
191757	40260	Troll	Hoonah	9/16/2001	38	NW			760
191761	40260	Troll	Hoonah	9/16/2001	38	NW			795
191768	40261	Troll	Hoonah	9/16/2001	38	NW			595
191751	40261	Troll	Hoonah	9/16/2001	38	NW			630
191760	40261	Troll	Hoonah	9/16/2001	38	NW			795
191762	40361	Troll	Hoonah	9/16/2001	38	NW			490
207001	40261	Troll	Elfin Cove	9/17/2001	38	NW	114	21	636
206993	40361	Troll	Elfin Cove	9/17/2001	38	NW	114	21	640
191776	40261	Troll	Hoonah	9/17/2001	38	NW	114	27	715
191796	40261	Troll	Hoonah	9/18/2001	38	NW	114	25	610
191789	40361	Troll	Hoonah	9/18/2001	38	NW	114	25	650
193735	40260	Troll	Pelican	9/18/2001	38	NW			644
193745	40261	Troll	Pelican	9/18/2001	38	NW	113	91	640
191809	40123	Troll	Hoonah	9/19/2001	38	NW			725
191814	40261	Troll	Hoonah	9/19/2001	38	NW			750
191841	40260	Troll	Hoonah	9/20/2001	38	NW	114	25	590
191844	40260	Troll	Hoonah	9/20/2001	38	NW	114	25	635
191843	40260	Troll	Hoonah	9/20/2001	38	NW	114	25	695
191849	40260	Troll	Hoonah	9/20/2001	38	NW	114	25	715
191837	40261	Troll	Hoonah	9/20/2001	38	NW	114	25	580
191903	40261	Troll	Hoonah	9/20/2001	38	NW	114	25	645
191905	40261	Troll	Hoonah	9/20/2001	38	NW	114	25	765
191829	40361	Troll	Hoonah	9/20/2001	38	NW	114	25	740
191922	40260	Troll	Hoonah	9/21/2001	38	NW	114	25	655
193851	40261	Troll	Pelican	9/21/2001	38	NW	113	91	544
186541	40123	Troll	Sitka	9/21/2001	38	NW	113	41	720
186365	40261	Troll	Sitka	9/21/2001	38	NW	114	21	633
186364	40261	Troll	Sitka	9/21/2001	38	NW	114	21	785
195169	40361	Troll	Yakutat	9/21/2001	38	NW	183	30	707
182274	40361	Fish wheels	Chilkat River	8/27/2001	35	NE	115	32	670
182261	40362	Fish wheels	Chilkat River	9/1/2001	35	NE	115	32	550
182263	40361	Fish wheels	Chilkat River	9/2/2001	36	NE	115	32	505
182262	40361	Fish wheels	Chilkat River	9/2/2001	36	NE	115	32	700
182277	40260	Fish wheels	Chilkat River	9/3/2001	36	NE	115	32	630
182276	40361	Fish wheels	Chilkat River	9/3/2001	36	NE	115	32	685
182279	40261	Fish wheels	Chilkat River	9/8/2001	36	NE	115	32	485
182278	40361	Fish wheels	Chilkat River	9/8/2001	36	NE	115	32	535
182281	40261	Fish wheels	Chilkat River	9/9/2001	37	NE	115	32	540
182280	40261	Fish wheels	Chilkat River	9/9/2001	37	NE	115	32	690
182246	40261	Fish wheels	Chilkat River	9/10/2001	37	NE	115	32	455
182284	40260	Fish wheels	Chilkat River	9/12/2001	37	NE	115	32	620

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Head number	Tag code	Gear	Port	Recovery date	Stat. week	Quad-rant	District	Sub-dist.	Length
182248	40361	Fish wheels	Chilkat River	9/12/2001	37	NE	115	32	585
182287	40261	Fish wheels	Chilkat River	9/18/2001	38	NE	115	32	530
182286	40361	Fish wheels	Chilkat River	9/18/2001	38	NE	115	32	630
182285	40361	Fish wheels	Chilkat River	9/18/2001	38	NE	115	32	680
182290	40123	Fish wheels	Chilkat River	9/19/2001	38	NE	115	32	650
182293	40260	Fish wheels	Chilkat River	9/19/2001	38	NE	115	32	560
182289	40261	Fish wheels	Chilkat River	9/19/2001	38	NE	115	32	435
182294	40261	Fish wheels	Chilkat River	9/19/2001	38	NE	115	32	460
182291	40261	Fish wheels	Chilkat River	9/19/2001	38	NE	115	32	510
182292	40361	Fish wheels	Chilkat River	9/19/2001	38	NE	115	32	600
182288	40361	Fish wheels	Chilkat River	9/19/2001	38	NE	115	32	660
182295	40261	Fish wheels	Chilkat River	9/20/2001	38	NE	115	32	390
182299	40260	Fish wheels	Chilkat River	9/21/2001	38	NE	115	32	380
189403	40260	Fish wheels	Chilkat River	9/21/2001	38	NE	115	32	455
189402	40260	Fish wheels	Chilkat River	9/21/2001	38	NE	115	32	490
182300	40260	Fish wheels	Chilkat River	9/21/2001	38	NE	115	32	575
182297	40261	Fish wheels	Chilkat River	9/21/2001	38	NE	115	32	430
182298	40261	Fish wheels	Chilkat River	9/21/2001	38	NE	115	32	610
189404	40260	Fish wheels	Chilkat River	9/22/2001	38	NE	115	32	660
189405	40261	Fish wheels	Chilkat River	9/22/2001	38	NE	115	32	660
189408	40123	Fish wheels	Chilkat River	9/23/2001	39	NE	115	32	670
189406	40260	Fish wheels	Chilkat River	9/23/2001	39	NE	115	32	720
189407	40261	Fish wheels	Chilkat River	9/23/2001	39	NE	115	32	530
189411	40260	Fish wheels	Chilkat River	9/24/2001	39	NE	115	32	570
189410	40260	Fish wheels	Chilkat River	9/24/2001	39	NE	115	32	580
189412	40261	Fish wheels	Chilkat River	9/24/2001	39	NE	115	32	470
189414	40261	Fish wheels	Chilkat River	9/26/2001	39	NE	115	32	515
189413	40261	Fish wheels	Chilkat River	9/26/2001	39	NE	115	32	685
189416	40261	Fish wheels	Chilkat River	9/27/2001	39	NE	115	32	450
189417	40261	Fish wheels	Chilkat River	9/27/2001	39	NE	115	32	630
189415	40361	Fish wheels	Chilkat River	9/27/2001	39	NE	115	32	695
189418	40260	Fish wheels	Chilkat River	9/29/2001	39	NE	115	32	680
189420	40260	Fish wheels	Chilkat River	10/1/2001	40	NE	115	32	425
189421	40261	Fish wheels	Chilkat River	10/1/2001	40	NE	115	32	645
189422	40260	Fish wheels	Chilkat River	10/2/2001	40	NE	115	32	615
189423	40361	Fish wheels	Chilkat River	10/3/2001	40	NE	115	32	620

SELECT RECOVERIES

90666	40260	Smolt study	Chilkat River	4/18/2001	16	NE	115	32	101
152304	40260	Troll	Sitka	8/1/2001	31	NW	113	91	
162135	40260	Troll	Yakutat	8/13/2001	33	NW	189	40	
162169	40260	Troll	Yakutat	8/13/2001	33	NW			
162145	40261	Troll	Yakutat	8/13/2001	33	NW	189	40	
195143	40260	Troll	Yakutat	8/31/2001	35	NW	181	60	
186466	40261	Troll	Sitka	9/4/2001	36	NW	113	91	

VOLUNTARY RECOVERIES

189432	40260	Sport	Chilkat River	10/14/2001	42	NE	115	32	720
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Appendix A4.–Computer files used in the analysis of data for this report.

FILE NAME	DESCRIPTION
00trapsum.xls	Excel workbook containing 2000 Chilkat River coho salmon smolt trapping and coded wire tagging data.
00smoltawl.xls	Excel workbook containing 2000 Chilkat River coho salmon smolt age-weight-length data.
00smoltest.xls	Excel workbook used to estimate 2000 Chilkat River coho salmon smolt emigration.
KatCohoFW01.xls	Excel workbook containing 2001 Chilkat River fish wheel coho salmon catch and age-length sample data.
Allcwtrecoveries2001.xls	Excel workbook containing recovery data and harvest estimates of Chilkat River coho salmon tagged as smolt during 2000.
