Fishery Data Series Report No. 06-30

Chilkoot River Weir Results 1999–2003

by

Randall L. Bachman

and

Mark M. Sogge

June 2006

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

Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used without definition in the following reports by the Divisions of Sport Fish and of Commercial Fisheries: Fishery Manuscripts, Fishery Data Series Reports, Fishery Management Reports, and Special Publications. All others, including deviations from definitions listed below, are noted in the text at first mention, as well as in the titles or footnotes of tables, and in figure or figure captions.

Weights and measures (metric)

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

Weights and measures (English)

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

Time and temperature

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

Physics and chemistry

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

General

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

Measures (fisheries)

fork length	FL
mideye-to-fork	MEF
mideye-to-tail-fork	METF
standard length	SL
total length	TL

Mathematics, statistics

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

FISHERY DATA SERIES REPORT NO. 06-30

CHILKOOT RIVER WEIR RESULTS 1999–2003

by
Randall L. Bachman,
and
Mark M. Sogge,
Alaska Department of Fish and Game, Division of Commercial Fisheries, Haines

Alaska Department of Fish and Game
Division of Sport Fish, Research and Technical Services
333 Raspberry Road, Anchorage, Alaska, 99518-1565

June 2006

The Division of Sport Fish Fishery Data Series was established in 1987 for the publication of technically oriented results for a single project or group of closely related projects. Since 2004, the Division of Commercial Fisheries has also used the Fishery Data Series. Fishery Data Series reports are intended for fishery and other technical professionals. Fishery Data Series reports are available through the Alaska State Library and on the Internet: http://www.sf.adfg.state.ak.us/statewide/divreports/html/intersearch.cfm This publication has undergone editorial and peer review.

Randall L. Bachman,
and
Mark M. Sogge
Alaska Department of Fish and Game, Division of commercial Fisheries,
Mile 1 Haines Highway, P.O. Box 330, Haines, AK 99827-0330, USA

This document should be cited as:
Bachman, R. L., and M. M. Sogge. 2006. Chilkoot River weir results 1999–2003. Alaska Department of Fish and Game, Fishery Data Series Report No. 06-30, Anchorage.

TABLE OF CONTENTS

Page

TABLE OF CONTENTS (Continued)

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

ABSTRACT

The Alaska Department of Fish and Game, Division of Commercial Fisheries has operated the adult salmon enumeration weir below the outlet of Chilkoot Lake since 1976. Mark-recapture studies of adult sockeye salmon, *Oncorhynchus nerka*, have been performed in conjunction with weir operations from 1996 through 2003. The objectives of the mark-recapture program were to validate the accuracy of the weir count and to estimate the total sockeye escapement (postseason) if fish were suspected to have passed the weir uncounted. In 1999, the visual weir count for sockeye salmon was 19,284 fish and the abundance estimate from mark–recapture was 62,000 (SE 6,000, 95% confidence interval (CI) of 50,000–74,000). In 2000, the visual weir count for sockeye salmon was 43,555 fish and the abundance estimate from mark–recapture was 60,000 (SE 5,000, 95% CI of 50,000–70,000). In 2001, the visual weir count for sockeye salmon was 76,283 fish and the abundance estimate from mark–recapture was 100,000 (SE 10,000, 95% CI of 81,000–119,000). In 2002, the visual weir count for sockeye salmon was 58,361 fish and the abundance estimate from mark–recapture was 61,000 (SE 4,000, 95% CI of 52,000–70,000). In 2003, the visual weir count for sockeye salmon was 74,459 fish and the abundance estimate from mark–recapture was 177,000 (SE 39,000, 95% CI of 99,000–254,000). The commercial gillnet harvest of Chilkoot Lake sockeye salmon was estimated to be: 4,258 fish in 1999; 14,133 fish in 2000; 67,502 fish in 2001; 24,275 fish in 2002; and 32,324 fish in 2003.

Key words: enumeration weir, Chilkoot River, sockeye salmon, *Oncorhynchus nerka*, mark–recapture, abundance estimate, commercial harvest.

INTRODUCTION

The Alaska Department of Fish and Game (ADF&G), Division of Commercial Fisheries (CF) has operated a weir on the Chilkoot River to estimate the escapement of sockeye *Oncorhynchus nerka*, coho *O. kisutch*, pink *O. gorbuscha*, and chum *O. keta* salmon into Chilkoot Lake from 1976 through 2003 (Bergander 1985; Kelley and Bachman 1999; Anne Beesley, former ADF&G employee, unpublished data). The primary species of interest is sockeye salmon; other species are counted incidentally while enumerating the sockeye salmon escapement to Chilkoot Lake. Reliable estimates of the sockeye salmon escapement and the monitoring of changes in escapement trends over time are necessary for responsive management of the District 115 (Figure 1) commercial drift gillnet fishery. Escapement information from this project is used to determine if escapement goals are being attained, to assess the effects of various management decisions on the escapement levels, and to provide data needed to reconstruct the run size of Chilkoot Lake (Figure 2) sockeye salmon stocks. Age and sex compositions of the escapements are monitored for any changes over the years that would give insight into the status of these stocks and would allow assessment of management strategies pertaining to these stocks. Run reconstruction conducted over a number of years provides a time series of data useful in the development of spawner-recruit relationships, estimation of maximum sustainable yield, determination of optimum escapement, and forecasting of returns.

Historical weir counts for sockeye salmon have ranged from 7,209 in 1995 to 102,973 in 1982 (Tables 1 and 2; Figure 3). Biological escapement goals were established for two separate stocks, early and late-run, in Chilkoot Lake (McPherson 1990). The overall escapement goal is 50,500 to 91,500 sockeye salmon. For the early-stock, the escapement goals are 16,500 to 31,500 fish. For the late-run stock, the escapement goals are 34,000 to 60,000.

Chilkoot Lake sockeye salmon are traditionally harvested in a commercial drift gillnet fishery in Lynn Canal, a subsistence fishery in Chilkoot Inlet and a sport fishery in the Chilkoot River and Chilkoot Lake. The commercial sockeye salmon harvest in the Lynn Canal (District 115) fishery is comprised of a mixture of Chilkoot Lake, Chilkat Lake, Chilkat River, and other, smaller, Lynn Canal sockeye salmon stocks. Scale pattern analysis (SPA) is used to estimate the contribution of these stocks of sockeye salmon to this fishery each season (Marshall et al. 1982; McPherson et

al. 1983, 1992; McPherson and Marshall 1986; McPherson 1987, 1989). Scale samples used as standards for Chilkoot Lake sockeye salmon stocks are collected at the Chilkoot River weir. Commercial drift gillnet harvests of Chilkoot sockeye salmon have ranged from approximately 2,000 in 1998 to 335,000 in 1987 (Table 3). The total return of Chilkoot Lake sockeye salmon has ranged from an estimated 15.6 thousand fish in 1995 to 433 thousand fish in 1987 (Table 4). The estimated exploitation rate for Chilkoot sockeye has varied from 7.8% in 1998 to 84.3% in 1989. The average annual subsistence harvest of Chilkoot Lake sockeye salmon in the last 5 years is 1,022 fish and the estimated 2000 to 2002 average annual sport fish harvest of Chilkoot Lake sockeye salmon is 1,410 fish (Table 5). The 1998 and 1999 sport fishing effort data were not included in this average since emergency closures were in place during those years to improve escapement of Chilkoot Lake sockeye salmon (Suchanek et al. 2001 a and 2001 b).

At this time, the Chilkoot River weir provides the best method of estimating the sockeye escapement into Chilkoot Lake. Because of the relatively short time lag between the commercial fishery and the weir, this project serves as a highly effective management tool by providing the timely information acquisition necessary to facilitate fishery decision making. The glacially turbid nature of this system precludes the use of aerial or foot surveys to evaluate the salmon escapement into this watershed. Foot surveys are conducted annually in significant inlet spawning streams to assess the spawning abundance and distribution of sockeye salmon to this system. However, these surveys are incidental in nature and are not applicable for indexing the total sockeye escapement as a significant proportion of Chilkoot sockeye salmon spawn in murky waters along the beach shoals and small inlet tributaries within Chilkoot Lake.

Because simple weir counts may not give a true representation of total escapement (McGregor and Bergander 1993; Shaul 1994; Kelley and Josephson 1997), mark-recapture experiments were initiated for Chilkoot Lake sockeye salmon beginning in 1996 and have continued each year since that time (Kelley and Bachman 1999). This technique is used to verify the weir counts and will provide an alternative means to estimate escapement abundance of sockeye salmon if the weir ever becomes inoperable.

LYNN CANAL DRIFT GILLNET HARVEST MANAGEMENT OVERVIEW

The Lynn Canal drift gillnet fishery targets stocks of sockeye, chum, and coho salmon. Chinook *O. tshawytscha* and pink salmon are harvested incidentally in the fishery. The overall management goal for the Chilkoot Lake sockeye salmon is the achievement of escapement that meets the biological escapement goals set for this system while harvesting the available surplus for a long-term maximum sustainable yield. The annual total Lynn Canal commercial gillnet harvest of Chilkoot Lake sockeye salmon between 1976 and 2003 has averaged 104,000 fish (Table 3). Annual harvests during the most recent 10-year period inclusive of 2003 (1994 to 2003) averaged 23,000 Chilkoot Lake sockeye salmon. The 1999 harvest of 4,300 fish was the second lowest on record. The 2000 harvest of 14,000 Chilkoot sockeye salmon was also substantially below the long-term harvest. In 2001, the commercial harvest of Chilkoot sockeye salmon increased to 68,000 fish, approximately 65% of the long-term average. The 2002 harvest of 24,000 sockeye salmon and the 2003 harvest of 32,000 sockeye salmon were both above the recent 10-year average, but significantly below the long-term average harvest.

The commercial fishing exploitation rate is kept to the level necessary to achieve escapement goals, when run strength allows. For the period of 1976 to 2003, the highest total return of sockeye salmon to Chilkoot Lake was the 1987 estimated 433,000 sockeye salmon (Table 4;

Figure 3). The commercial fishing exploitation rate in 1987 was 78%, the second highest on record. In contrast, the 1995 total return of 15,600 sockeye salmon, the lowest return in the 1976 to 2003 period, was managed with a commercial exploitation rate of 53.9%. The average total return for Chilkoot Lake sockeye salmon is 173,000 fish for the 1976 to 2003 period (commercial exploitation average rate 50.0%), and 66,800 sockeye salmon for the recent 10-year period inclusive of 2003 (1994 to 2003), the commercial exploitation rate averaged 34.1% (Table 4). The 1999 estimated total return of 66,400 Chilkoot Lake sockeye salmon was only 6.7% of the 1976 to 2003 average total return and the 1999 commercial exploitation rate of 6.7% was 37% of the 1976 to 2003 average rate. In 2000, the total return was an estimated 75,300 sockeye salmon and was managed with a 20.3 % exploitation rate, 41% of the long-term (1976 to 2003) average exploitation rate. The 2001 total return of 170,200 Chilkoot Lake sockeye salmon was 86% of the long-term average total return. The 2001 commercial exploitation rate of 41.2% was 94% of the 1976 to 2003 average rate. In 2002 the sockeye total return was 88,000 fish, 48% of the 1976–2003 average and was commercially exploited at the rate of 30.7%, which is 59% of the 1976–2003 average rate. The 2003 Chilkoot Lake total sockeye salmon return was 213.8 fish, just over the long-term average total return. Similarly, the 2003 commercial exploitation rate of 17.2% was 36% of the long-term average exploitation rate.

The management of the Lynn Canal gillnet fishery is conducted primarily through time and area restrictions, with mesh size restrictions utilized where it is necessary to differentially target harvest on different salmon species. The sockeye fishery is a mixed-stock fishery, with the Chilkoot Lake sockeye salmon blending with the Chilkat Lake sockeye salmon, the Chilkat River mainstem sockeye salmon and, to a lesser extent, the Berners Bay sockeye salmon.

The Lynn Canal (District 115) is divided into three sections (Figure 1). In the northernmost section, 15-A, the primary method of limiting the harvest of the Chilkoot Lake sockeye salmon is to restrict the gillnet fleet to an area along the western shoreline or within Chilkat Inlet. In the 1999 to 2003 period covered by this report, this restriction was employed through statistical week 29 in all years except 2002. The apparent strength of the early-stock sockeye salmon in 2002 (Table 2) resulted in the opening of the eastern shoreline of section 15-A, south of Seduction Point, in statistical week 27. In 1999 and 2000 the weakness of the Chilkoot Lake sockeye salmon return resulted in the continued closure of the east shore of section 15-C through statistical week 34, when, on average, the majority of Chilkoot Lake sockeye salmon have already passed through the area south of Seduction Point. When information from scale pattern analysis, harvest rates and weir counts indicate a strong return of Chilkoot Lake sockeye salmon, ADF&G has opened areas within Chilkoot and Lutak Inlets on extended periods to harvest this stock. While this situation did not occur for the early-run segment of Chilkoot Lake sockeye salmon during the years covered by this report, Chilkoot Inlet was opened in 2001, 2002, and 2003 to provide opportunity to harvest late-run Chilkoot Lake sockeye salmon.

The southernmost section, 15-C, is subject to an intensive early season gillnet fishery focused on the harvest of hatchery summer chum salmon. The timing of Chilkoot sockeye salmon migration through area 15-C is very similar to the return timing of the summer chum salmon (Figure 4). The temporal and spatial overlap of the summer chum salmon and Chilkoot sockeye salmon returns requires inseason assessment of the strength of the sockeye return. ADF&G samples commercially harvested sockeye salmon and monitors sockeye stock composition through scale pattern analysis. Stock specific harvest information and Chilkoot weir sockeye escapement data are used to determine commercial fishing openings that allow for the harvest of the enhanced

chum salmon while assuring that wild-stock Chilkoot sockeye escapement goals are met. In addition to time and area restrictions, the gillnet fishery in this area is also managed by specifying the minimum gillnet mesh size. If ADF&G determines that time, area or mesh size restrictions are necessary to minimize the harvest of either Chilkoot or Chilkat sockeye salmon, then the restrictions are implemented.

For the years 1999 to 2003, ADF&G imposed mesh size restrictions and area restrictions in section 15-C. In addition, the number of days fished per week was also limited. From the start of the season through statistical week 30, the gillnet fleet was limited to the area south of Point Bridget and allowed to fish a minimum of 6 inch mesh nets. The mesh restriction did not apply to the Boat Harbor fishing area, where sockeye harvest is usually minimal and a high percentage of the sockeye are Chilkat Lake in origin. In 1999 and 2000, the 6 inch mesh restriction and the Point Bridget south area restriction was continued through statistical week 31, and then 15-C was closed (except Boat Harbor area) through week 34 to protect the weak Chilkoot Lake sockeye return. The stronger Chilkoot Lake sockeye return in 2001 resulted in the lifting of the mesh restriction and the opening of all of section 15-C in statistical week 32. In 2002 and 2003, the mesh restriction was lifted in statistical week 31 and all of section 15-C was opened, with fishing time still limited. In an attempt to allow for the harvesting of enhanced chum salmon while further protecting the wild stocks of sockeye salmon, ADF&G opened a small area south and east of Vanderbilt Reef to commercial drift gillnet fishing in 2003. This area extended the regular opening by one or two days during statistical weeks 27, 28, and 29. The 6 inch mesh size restriction remained in effect in this area.

GOALS

1. Estimate the number of adult sockeye salmon escaping into Chilkoot Lake through mark-recapture methods.
2. Estimate the age, sex, and length composition of sockeye salmon captured at the Chilkoot Lake weir site each week.
3. Estimate the annual commercial harvest of Chilkoot Lake sockeye salmon in the Lynn Canal drift gillnet fishery.

OBJECTIVES

1. Enumerate sockeye, pink, chum, and coho salmon as they are passed through the weir, and communicate this information to fishery managers.
2. Mark 20% of the enumerated sockeye salmon as they are passed through the weir during the 1999 season, and 10% of the enumerated sockeye salmon during the 2000–2003 seasons.
3. Obtain representative scale, length, and sex data from at least 635 sockeye salmon throughout the run.

METHODS

STUDY AREA DESCRIPTION

Chilkoot Lake (59° 21′ 16” N, 135°35′ 42” W) is glacially turbid, has a surface area of 7.0×10^6 m^2 (1,734 acres), mean depth of 54.5 meters, a maximum depth of 89 meters and a total volume of 382.4×10^6 m^3. The lake outlet is at the head of Lutak Inlet located approximately 16 kilometers northeast of the city of Haines, Alaska and about 1 kilometer from tide line (Figure 2).

Chilkoot Lake and associated inlet rivers and streams drain approximately 332 km^2 of land. The lake is located within the northern temperate rainforest that dominates the Pacific Northwest coast of North America. The climates of this area are characterized by cold winters and cool, wet summers. Average precipitation for the study area is ~165 cm/yr (Bugliosi 1988). Sitka spruce, Western hemlock, and Sitka alder dominate this forested watershed.

WEIR OPERATION AND BIOLOGICAL SAMPLING

Escapement enumeration, marking, and sampling at the Chilkoot River weir typically begin in the first week of June and run into the second week of September (Table 6).

The installation of the weir involved the placement of pickets in the existing supporting structure and the installation of a weir trap, sampling stations, and a recovery pen. The Chilkoot weir is a 360-foot wide steel structure built in 1976 and supported by 8 inch steel pilings driven approximately 7 m into the bottom of the Chilkoot River channel. Schedule 40 black iron pipe, 25.4 mm-outside diameter, is used for pickets and is placed vertically along the face of the weir at 63.5 mm center to center intervals. The maximum spacing of the pickets was designed to be 38.1 mm. Following installation, the weir was inspected for gaps regularly. Weir personnel donned neoprene stocking-foot waders and walked across the face of the weir feeling for gaps with their feet at least once per day. When conditions (river level and clarity) permitted, the weir was examined using snorkel gear and dry suits. Any suspected fish sized gaps were blocked using sandbags or plastic coated wire mesh.

Migrating salmon were enumerated by removing three pickets, which allowed fish to pass upstream unimpeded. Weir personnel sat above the opening in the weir and tallied fish by species as they passed through the weir during daylight hours. Lengths of ¾ inch plywood that were painted white for contrast were placed on the front of the weir at the bottom of the gap in the pickets. With these plywood pieces in place, the fish were much easier to enumerate and identify. Migrating fish were also enumerated by removing pickets on the downstream side of a fish trap located at the apex of the weir and allowing fish to passively emigrate into the trap. Trapped fish were dip netted, enumerated and released immediately upstream of the weir. Hookless fishing lures were suspended at the opening of the weir trap to attract salmon into it. Sockeye salmon captured in the trap or dip netted from the opening in the weir fencing was sampled for scales, sex determination and length. One scale per fish was taken from the preferred area of the fish (ADF&G 1994). Lengths were measured from mid-eye to fork-of-tail (MEF) to the nearest 5 millimeters. Sex was determined by examining external dimorphic sexual maturation characteristics, such as kipe development, belly shape and trunk depth. Date of sample, sex, length, and data regarding the condition of each fish was recorded on mark-sense or OPSCAN forms. A daily record of stream height and temperature was taken at approximately 0600 each day. Stream height was measured in centimeters on a stadia rod and temperatures were taken with a mounted thermometer to the nearest degree Celsius.

The scale data was used for the Lynn Canal sockeye salmon marine stock composition project to develop stock identification standards. Sampling frequency was based primarily on daily abundance. During days of peak fish movement, a larger number of fish were sampled to achieve the seasonal goal of 635 scales, lengths, and sex composition of Chilkoot sockeye salmon. The weekly passage of sockeye salmon is compared to the previous 10-year averages as a measure of relative run timing.

SOCKEYE SALMON RUN TIMING

Stock-specific run timing for sockeye salmon to Chilkoot Lake was analyzed by the cumulative numbers of fish passage through the weir between certain dates. The early sockeye salmon stock run is characterized by the number of fish observed through the weir from the start of the season through statistical week 28. The late portion of this run is the observed numbers of fish passing through the weir from statistical week 29 through the end of the run.

MARK-RECAPTURE METHODS

Sockeye salmon were removed from the trap or dip netted as they passed through the gap in the weir fencing and marked. Sockeye less than or equal to 360 mm MEF were not marked. Marking rates were adjusted on a daily basis depending on daily weir counts to ensure that the marking objective (20% in 1999, 10% in 2000 to 2003) of the sockeye salmon observed at the weir was achieved. With the exception of the first stratum of 2003, all sockeye salmon greater than 360 mm MEF captured at the weir received a primary mark of an adipose fin clip and a secondary fin clip to allow temporal stratification of the abundance estimate if necessary (Table 7). In 1999 and 2000 each release or timing stratum was established to correspond to approximately 33.3% of the Chilkoot Lake sockeye salmon run counted through the weir. This was determined by identifying the weeks that 33.3%, 66.6%, and 100% of the historic (1976–1998 average), cumulative Chilkoot Lake sockeye salmon runs were counted through the weir. In 2001, the strata were adjusted to extend the first marking stratum an additional week to more accurately reflect the early and late-stock composition of the Chilkoot Lake sockeye run. The number of differentiated marking strata was further expanded in 2002, with different marks applied for each two week period of weir operation. This schedule was continued in 2003. The increased number of strata within each season allowed for more options for the pooling of data to generate reliable estimates of sockeye abundance.

Once the marking and sampling procedures were completed, sockeye salmon were released into a holding recovery box upstream of the weir. The holding box was a 2x2-m plywood structure with a hole large enough for a sockeye salmon to swim through cut into one side. This box was placed against the upstream face of the weir in approximately 0.5-m of water. Fish were allowed to recover from handling stress while in the box and out of the main current force of the river. The fish would later exit the box on their own volition. This method was designed to reduce mortality encountered during the marking and sampling procedures.

Recovery efforts were conducted once or twice per week depending on fish abundance beginning in mid-July. Recovery events were located on inlet tributaries and spawning areas along Chilkoot Lake. Sampling fish on spawning grounds occurred once or a maximum of twice each week to minimize disturbance of spawning fish. Sockeye salmon were captured by means of a 20-meter by 2.7-meter beach seine and a 5-meter by 2.7-meter linen 12-cm mesh size gillnet. Sockeye salmon were typically concentrated on spawning beaches on the western shore of Chilkoot Lake and at Bear Creek. Bear Creek is a small tributary located approximately 3 km upstream of the river inlet to Chilkoot Lake. Floating sockeye salmon carcasses were also examined. All fish examined in the recovery event were marked with a hole punch made to the left opercule to prevent future sampling of the same fish. Each fish was measured from mid-eye to fork of tail. All sockeye salmon captured were examined initially for the presence of a left opercule punch mark. If the mark was absent, the fish was then examined for the presence of a primary mark (adipose clip). If an adipose fin was missing, the type of secondary mark was noted. Live fish were then gently released.

Marking and mark recovery data were organized by ADF&G statistical week for analysis. Statistical weeks began at 00:01 a.m. Sunday and ended the following Saturday at midnight, with weeks being numbered sequentially beginning with the week encompassing the first Saturday in January. Inclusive dates for the 1999–2003 statistical weeks are shown in Appendix A1.

LYNN CANAL DRIFT GILLNET HARVESTS

Estimates of Chilkoot Lake sockeye stock contribution in the Lynn Canal drift gillnet fishery were derived from scale pattern analysis. Scale samples were collected each week from the commercial catch. Commercial catches of sockeye salmon were tabulated during and after each fishery opening using fish ticket information collected from processors and commercial fishing vessels. Commercial catch was reported by fishing period and assigned to a statistical week. ADF&G employees collected sockeye salmon scales from fish sampled on fishing vessels and tenders on the fishing grounds during open fishing periods. Scales were also collected at the port of Excursion Inlet during time of delivery by processor tenders. Scales were obtained from the preferred area of the left side of the fish as shown in ADF&G (1994). Scale samples collected from each fishing period were sent to the scale lab in the Region I, ADF&G office in Douglas, Alaska for analysis.

Based on SPA, sockeye salmon harvested in Lynn Canal were assigned to one of three different stock groupings. These groups were Chilkat Lake, Chilkoot Lake, and "others." The "others" group is comprised primarily of Chilkat River mainstem and Berners Bay rivers sockeye salmon but also includes other smaller Lynn Canal stocks. These stock proportions were applied to the total weekly commercial harvest of sockeye salmon. Estimates of the total catch by stock group and age class were made by applying each age and stock proportion to the catch during each fishing period, and summing the estimates across periods (Bachman and McGregor 2001). Scale samples collected from the Chilkoot River weir project form the standards to which comparisons can be made to those samples collected from the commercial fishery.

STATISTICAL METHODS

The assumptions necessary to form consistent stratified mark–recapture estimates in this study include:

1. All fish that passed Chilkoot weir during the period of interest had a non-zero probability of recovery on the spawning grounds and all fish counted by the weir had a non-zero probability of being marked (i.e., the population is closed).
2. There was no mark-induced mortality, mark misidentification, or non-reporting. Should any of these occur, they were to be estimated and adjustments made to this information.
3. All fish, marked or not, were independently caught with the same probability in any given recovery stratum.
4. All fish, marked or not, moved from a given release stratum to the recovery strata independently with the same probability distribution.
5. There were no release strata or recovery strata where no marks were released or found, respectively, and there were no rows or columns of the release-recovery matrix which were linear combinations of other rows or columns, respectively.

Mark–recapture data were compiled into a matrix summarized by marking and recapture periods. Sockeye salmon less than or equal to 360 mm MEF were excluded from the analysis. The

mark-recapture matrices were then analyzed using a statistical program called "Stratified Population Analysis System" (SPAS; Arnason et al. 1996). This program provides stratified and pooled population estimates using maximum likelihood techniques (Plante 1990) and associated variances where *s* (the number of tagging strata) and *t* (number of recovery strata) are not equal. For cases in which $s=t$, the model provides stratified population estimates based on Chapman and Junge (1956) and Darroch (1961). Stratified methods can be used as it allowed the probabilities of capture in marking and recovery strata to vary across time.

The SPAS program also provides results for two tests for appropriateness of pooling the data. If the initial analysis of the data resulted in negative probabilities of capture, mark–recovery data was pooled for analysis. The Pooled Petersen Estimate (PPE) was used when pooling tests performed by the SPAS program confirmed the validity of this model for the Chilkoot Lake mark-recapture data.

If either of the following conditions is met, then full pooling of the data is considered appropriate for a PPE:

1. The recovery probabilities are constant across strata (i.e., probability of recapture is the same regardless of strata origin).
2. The expected ratio of marked to unmarked fish is constant across all recovery strata.

The test labeled "complete mixing" (condition #1) is a test of the hypothesis that the probability of recovering a released animal is independent of its stratum of origin. The test labeled "equal proportions" at the beginning of the analysis results tests for condition #2. If either test is not statistically significant ($P>0.05$), then Arnason et al. (1996) recommend that the PPE is the appropriate estimator. If both tests failed, we used the alternate method that Arnason et al. recommend. This situation occurred in 2003.

A necessary assumption of the population estimation technique used is that all fish in a particular recovery stratum, whether marked or unmarked, have the same capture probability. One factor that could violate this assumption is if tagging and recapture gear is selective for different sized fish. To test for this selectivity, cumulative distribution functions (CDF) of length for fish marked at the weir and fish sampled on the spawning grounds (combined strata) were compared for each year. The inspection of the CDF can show significant size differences between weir or marking samples and the spawning ground or recovery samples. If this occurs it indicates that probabilities of capture were not equal for fish of all sizes during marking or recovery events. Even so, because of the substantial sample sizes, the tests for different size distributions may indicate a statistically significant difference when no practical difference exists.

Scale samples were aged in the Region 1 aging Laboratory in Douglas, Alaska. Length, sex, and age results were recorded on mark-sense data forms (ADF&G 1994). When complete, the forms were then scanned and a computer file was generated and saved onto disk. That file was then analyzed using two (M. Olsen ADF&G Division of Commercial Fisheries, Juneau) computer programs. One program summarized age data by statistical week and sex. The other summarized length information by statistical week and sex.

RESULTS

WEIR COUNTS

In general, weir counts for coho and chum salmon were not representative of the total abundance. The weir was removed prior to the peak of the return for both chum and coho salmon. Additionally, the weir count did not represent the total abundance of the pink salmon spawning population in the Chilkoot River. As the weir was pulled each year, thousands of pink salmon were actively spawning below the weir. The Chinook salmon counted at the Chilkoot River weir are likely strays from enhancement projects in upper Lynn Canal. There is no endemic run of Chinook salmon to the Chilkoot River.

1999

A total of 19,284 sockeye, 11 coho, 62,370 pink, 747 chum, and 27 Chinook salmon were enumerated at the Chilkoot River weir between June 2 and September 13, 1999 (Table 1; Appendix B1). There were no high water level events that required the removal of picket fencing from the weir to prevent possible weir and riverbed scour damage.

The cumulative weir count for the early segment (statistical weeks 23 through 28) of the Chilkoot Lake sockeye return was 3,588 fish, 20% of the 1976 to 2003 average of 17,793 fish (Table 2). Based on the weir count, the escapement objective of the early-run was not met. The weir count of the early-run sockeye salmon was 22% of the lower bound goal of 16,500 fish (Table 8; Figure 5).

The total weir count for the late segment (statistical weeks 29 through the end of the run) of the Chilkoot Lake sockeye return was 15,696 fish, 32% of the 1976 to 2003 average of 48,584 fish (Table 2). Escapement goals for this segment of the run were also not met. The cumulative late-run weir count was 46% of the lower bound goal of 34,000 fish (Table 8; Figure 5).

The combined early and late Chilkoot Lake sockeye total weir count of 19,284 fish was 29% of the 1976 to 2003 average of 66,376 fish and 45% of the 1994 to 2003 average escapement of 42,389 sockeye (Table 2; Figure 6). The 1999 weir count was 38.2% of the lower bound management goal of 50,500 fish (Table 8; Figures 3 and 5).

The pink salmon weir count of 62,370 was 3.3 times the 1976 to 2003 average and higher than any pink escapement previously counted through the weir (Table 1). An additional 20,000 to 30,000 pink salmon were observed spawning below the weir at time the weir was being removed.

2000

A total of 43,555 sockeye, 47 coho, 23,636 pink, 1,050 chum, and 10 Chinook salmon were enumerated at the Chilkoot River weir between June 3 and September 12, 2000 (Table 1; Appendix B2). No high water level events occurred requiring the removal of picket fencing from the weir.

The cumulative weir count for the early segment (statistical weeks 23 through 28) of the Chilkoot Lake sockeye return was 7,847 fish, 44% of the 1976 to 2003 average of 17,793 fish (Table 2). Based on the weir count, the escapement objective of the early-run was not met. The weir count of the early-run sockeye salmon was 48% of the lower bound goal of 16,500 fish (Table 8; Figure 5).

The total weir count for the late segment (statistical weeks 29 through the end of the run) of the Chilkoot Lake sockeye return was 35,708 fish, 74% of the 1976 to 2003 average of 48,584 fish (Table 2). The weir count closely tracked the lower bound of the escapement goal for this segment of the run. The cumulative late-run weir count was 5% over the lower bound goal of 34,000 fish (Table 8; Figure 5).

The combined early and late Chilkoot Lake sockeye total weir count of 43,555 fish was 66% of the 1976 to 2003 average of 66,376 fish and just over the 1994–2003 average escapement of 42,389 sockeye (Table 2; Figure 6). This weir count was 86% of the lower bound management goal of 50,500 fish (Table 8; Figures 3 and 5).

The pink salmon weir count of 23,636 was 24% greater than the 1976 to 2003 average (Table 1).

2001

A total of 76,283 sockeye, 103 coho, 32,294 pink, 810 chum, and 24 Chinook salmon were enumerated at the Chilkoot River weir between June 7 and September 12, 2001 (Table 1; Appendix B3). There were no high water level events that required the removal of picket fencing from the weir to prevent possible weir and riverbed scour damage.

The cumulative weir count for the early segment (statistical weeks 23 through 28) of the Chilkoot Lake sockeye salmon return was 13,544 fish, 76% of the 1976–2003 average of 17,793 fish (Table 2). Based on the weir count, the escapement objective of the early-run was not met. The weir count of the early-run sockeye salmon was 82% of the lower bound goal of 16,500 fish (Table 8; Figure 5).

The total weir count for the late segment (statistical weeks 29 through the end of the run) of the Chilkoot Lake sockeye return was 62,739 fish, 1.3 times the 1976 to 2003 average of 48,584 fish (Table 2). A strong surge of fish during statistical weeks 29 through 32 contributed to a cumulative total escapement for the late-run that was 5% over the upper bound escapement goal of 60,000 fish (Table 8; Figure 5).

The combined early and late Chilkoot Lake sockeye total weir count of 76,283 fish was approximately 1.2 times the 1976 to 2003 average of 66,376 fish and 1.8 times the 1994 to 2003 average of 42,389 (Table 2; Figure 6). This weir count was 1.2 times the management point goal of 62,000 fish but still well under the upper bound goal of 91,500 sockeye (Table 8; Figures 3 and 5).

The pink salmon weir count of 32,294 fish, was 1.7 times the 1976 to 2003 average (Table 1).

2002

A total of 58,361 sockeye, 304 coho, 79,639 pink, 352 chum, and 36 Chinook salmon were enumerated at the Chilkoot River weir between June 8 and September 11, 2002 (Table 1; Appendix B4). There were no high water level events that required the removal of picket fencing from the weir to avoid damage.

The cumulative weir count for the early segment of the Chilkoot Lake sockeye return was 13,760 fish, 77% of the 1976 to 2003 average of 17,793 fish (Table 2). Based on the weir count, the escapement objective of the early-run was not met. The weir count of the early-run sockeye salmon was 83% of the lower bound goal of 16,500 fish (Table 8; Figure 5).

The total weir count for the late segment of the Chilkoot Lake sockeye return was 44,601 fish, 92% of the 1976 to 2003 average of 48,584 fish (Table 2). Escapement goals for this segment of the run were met. The cumulative late-run weir count was approximately 1.1 times the total late-stock goal of 40,000 fish (Table 8; Figure 5).

The combined early and late Chilkoot Lake sockeye total weir count of 58,361 fish was 88% of the 1976 to 2003 average of 66,376 fish and 1.4 times the 1994–2003 average escapement of 42,389 sockeye (Table 2; Figure 6). This weir count was 94% of the total Chilkoot Lake escapement management point goal of 62,000 fish (Table 8; Figures 3 and 5).

The pink salmon weir count of 79,639 was 4.2 times the 1976 to 2003 average and the highest on record (Table 1).

2003

A total of 74,459 sockeye, 15 coho, 55,424 pink, 498 chum, and 12 Chinook salmon were enumerated at the Chilkoot River weir between June 6 and September 9, 2003 (Table 1; Appendix B5). One high water flood event required the removal of picket fencing from the weir to prevent possible weir and riverbed scour damage. Pickets were removed at 21:00 on August 15, and the weir was not fish tight once again until 17:00 on August 17. It was not possible to enumerate fish passing through the weir during this 44-hour period but sockeye were observed below the weir prior to the removal of the pickets.

The cumulative weir count for the early segment (statistical weeks 23 through 28) of the Chilkoot Lake sockeye return was 8,849 fish, 50% of the 1976 to 2003 average of 17,793 fish (Table 2). Based on the weir count, the escapement objective of the early-run was not met. The weir count of the early-run sockeye salmon return was 54% of the lower bound goal of 16,500 fish (Table 8; Figure 5).

The total weir count for the late segment (statistical weeks 29 through the end of the run) of the Chilkoot Lake sockeye return was 65,610 fish, 1.4 times the 1976 to 2003 average of 48,584 fish (Table 2). This weir count is double the recent 10-year average of 32,851 sockeye. The late-stock escapement goal upper bound of 60,000 fish was exceeded by 9% (Table 8; Figure 5).

The combined early and late Chilkoot Lake sockeye total weir count of 74,459 fish was 1.1 times the 1976 to 2003 average of 66,376 fish and 1.8 times the 1994 to 2003 average of 42,389 (Table 2; Figure 6). This weir count was 1.2 times the management point goal of 62,000 fish but still well under the upper bound goal of 91,500 sockeye (Table 8; Figures 3 and 5).

The pink salmon weir count of 55,424 was 2.9 times the 1976 to 2003 average and the third highest on record (Table 1).

SOCKEYE SALMON STOCK TIMING

The graph of the long-term (1976–2003) timing of the Chilkoot Lake sockeye shows a distinctly bimodal run timing pattern, with peaks at statistical week 25 and statistical week 31 (Figure 7). Results of the Chilkoot Lake sockeye salmon migration run timing are discussed by each year.

1999

The passage of early-run Chilkoot Lake sockeye in 1999 peaked through the lower river in late June through early July (statistical week 27; Figure 7). There were two distinct peaks of fish movement during the late sockeye salmon run. The first peak occurred in late July through early

August (statistical weeks 30 to 32) and a larger second peak during late August through early September (statistical weeks 35 to 37). The late-run stock initially peaked similar in timing to the long-term average. The second peak of the late-run was unusual in comparison to the long-term (1976 to 2003) average run timing.

2000

The early-stock escapement timing in 2000 was initially later than the long-term average but peaked during the third week in June (statistical week 26), matching this average. The late-run component of the Chilkoot sockeye stock peaked during the first two weeks of August (statistical weeks 32 to 33), one week later than the long-term average. The late-run also exhibited a second minor peak in the last week of August (statistical week 36; Figure 7).

2001

The escapement of Chilkoot Lake sockeye in 2001 showed a distinctive bimodal pattern. The early-run peaked in late June (statistical week 26), approximately one week later than the long-term average. The late sockeye salmon run was more compressed than average, with 58% of the run returning during the 3-week period from July 22 to August 11 (statistical weeks 30 to 32; Figure 7).

2002

The early-stock escapement in 2002 exhibited timing similar to the long-term average, peaking during the last week in June (statistical week 26). There were two distinct peaks of fish movement during the late sockeye salmon run. The first peak was strongest, and occurred from mid July through early August (statistical week 29 to 31). This peak was one week earlier than the long-term average. The second peak in the run timing occurred in the third week of August (statistical week 34; Figure 7).

2003

The 2003 Chilkoot Lake sockeye early-run showed a slow increase through statistical week 27, without a distinctive peak. The late-stock sockeye run timing was compressed in a manner similar to the 2001 run timing. A total of 63% of the entire Chilkoot Lake sockeye run returned between July 20 and August 9 (statistical weeks 30 to 32). A small, secondary peak in the late-run sockeye return occurred in statistical week 35 (Figure 7).

MARK–RECAPTURE ABUNDANCE

1999

A total of 3,952 sockeye salmon were marked and released at the Chilkoot River weir with an adipose fin clip and secondary mark (Table 9). The marking fraction represented 20.5% of the total escapement counted through the weir. During recapture efforts at Chilkoot Lake and inlet tributaries, 1,410 sockeye salmon were examined in these areas for marks originating at the weir (Table 10). Eighty-nine sockeye salmon with missing adipose fins were recovered. Overall, 6.8% of the sockeye salmon recovered in Chilkoot Lake were marked. The percentage of marked fish recovered, analyzed by marking strata, varied from 0.90% to 6.20% (Table 11).

Because an initial analysis of the data resulted in negative probabilities of capture, mark–recovery strata were pooled, reducing the recovery strata from 15 to 4 to increase the number of mark recoveries in each stratum. Because χ^2–test for equal proportions was non-significant

(*P*-val=0.38), we reported the pooled Petersen estimate of 62,000 (SE 6,000), (95% confidence interval: 50,000 to 74,000) Chilkoot Lake sockeye salmon (Table 15). The pooled Petersen estimate was used because pooling tests performed by the SPAS program confirmed the validity of this model for the Chilkoot Lake mark–recapture data in 1999.

The CDF of length for fish marked at the weir and fish sampled on the spawning grounds (combined strata) in 1999 were significantly different (Figure 8, top). Inspection of the CDF clearly shows that large fish were relatively more prevalent in weir or marking samples than in the spawning ground or recovery samples and indicates that probabilities of capture were not equal for fish of all sizes during marking and/or recovery events.

2000

A total of 4,386 sockeye salmon were marked and released at the Chilkoot River weir with an adipose fin clip and secondary mark (Table 9). The marking fraction represented 10.1% of the total escapement counted through the weir. During recapture efforts at Chilkoot Lake and inlet tributaries, 1,781 sockeye salmon were examined in these areas for marks originating at the weir (Table 10). A total of 128 sockeye salmon with missing adipose fins were recovered. Overall, 7.0% of the sockeye salmon recovered in Chilkoot Lake were marked. The percentage of marked fish recovered, analyzed by marking strata, varied from 0.89% to 10.60% (Table 11).

Because an initial analysis resulted in negative probabilities of capture, mark–recovery strata were pooled, reducing the recovery strata from 16 to 14 to increase the number of recoveries in each stratum. Additionally, the tagging strata were pooled into two strata. This pooled data set is displayed in Table 12. Because the χ^2-test for equal proportions was non-significant (*P*-val=0.10), we reported the pooled Petersen estimate of 60,000 (SE=5,000), (95% confidence interval: 50,000–70,000) Chilkoot Lake sockeye salmon.

The CDF of length for fish marked at the weir and fish sampled on the spawning grounds (combined strata) in 2000 were significantly different (Figure 8, middle). Inspection of the CDF clearly shows that large fish were relatively more prevalent in weir or marking samples than in the spawning ground or recovery samples and indicates that probabilities of capture were not equal for fish of all sizes during marking and/or recovery events.

2001

A total of 6,368 sockeye salmon were marked and released at the Chilkoot River weir with an adipose fin clip and secondary mark (Table 9). The marking fraction represented 8.3% of the total escapement counted through the weir. During recapture efforts at Chilkoot Lake and inlet tributaries, 1,480 sockeye salmon were examined in these areas for marks originating at the weir (Table 10). Ninety-two sockeye salmon with missing adipose fins were recovered. Overall, 6.3% of the sockeye salmon recovered in Chilkoot Lake were marked. The percent of marked fish recovered, analyzed by marking strata, varied from 0.32% to 4.26% (Table 11).

Mark–recovery data were pooled for analysis. It was not necessary to reduce the number of recovery strata in order to increase the number of mark recoveries in each stratum. Because an initial analysis of the data resulted in negative probabilities of capture, we reduced the tagging strata from 3 to 2 by combining the last two tagging strata. This pooled data set is displayed in Table 12. Because the χ^2-test for equal proportions was non-significant (*P*-val=0.74), we reported the pooled Petersen estimate of 100,000 (SE 10,000), (95% confidence interval: 81,000 to 119,000) Chilkoot Lake sockeye salmon.

The CDF of length for fish marked at the weir and fish sampled on the spawning grounds (combined strata) in 2001 were significantly different (Figure 8, bottom). However, the results were the reverse of comparisons conducted for 1999 and 2000. This year, inspection of the CDF clearly showed that small fish were relatively more prevalent in weir or marking samples than in the spawning ground or recovery samples. It is still indicated that probabilities of capture were not equal for fish of all sizes during marking or recovery events.

2002

A total of 5,419 sockeye salmon were marked and released at the Chilkoot River weir with an adipose fin clip and secondary mark (Table 9). The marking fraction represented 9.3% of the total escapement counted through the weir. During recapture efforts at Chilkoot Lake and inlet tributaries, 1,887 sockeye salmon were examined in these areas for marks originating at the weir (Table 10). A total of 166 sockeye salmon with missing adipose fins were recovered. Overall, 9.5% of the sockeye salmon recovered in Chilkoot Lake were marked. The percent of marked fish recovered, analyzed by marking strata, varied from 1.45% to 8.08% (Table 11).

Because an initial analysis resulted in negative probabilities of capture, mark-recovery data were pooled, reducing the recovery strata from 16 to 15 to increase the number of recoveries in each stratum. Additionally, the tagging strata were pooled into six strata. This pooled data set is displayed in Table 12. Because the χ^2-test for equal proportions was non-significant (*P*-val=0.50), we reported the pooled Petersen estimate of 61,000 (SE 4,000), (95% confidence interval: 52,000 to 70,000) Chilkoot Lake sockeye salmon.

The CDF of length for fish marked at the weir and fish sampled on the spawning grounds (combined strata) in 2002 were significantly different (Figure 9, top). As the CDF graphs illustrate, the size difference between the fish sampled in the two events was less pronounced in 2002 than in the other years covered by this report. However, the differences were significant enough that probabilities of capture were not equal for fish of all sizes during marking or recovery events.

2003

A total of 6,363 sockeye salmon were marked and released at the Chilkoot River weir with an adipose fin clip and secondary mark (the initial marking stratum was only marked with the adipose clip) (Table 9). The marking fraction represented 8.5% of the total escapement counted through the weir. During recapture efforts at Chilkoot Lake and inlet tributaries, a total of 1,529 sockeye salmon were examined in these areas for marks originating at the weir (Table 10). Sixty sockeye salmon with missing adipose fins were recovered. Overall, 4.4% of the sockeye salmon recovered in Chilkoot Lake were marked. The percent of marked fish recovered by marking strata varied from 0% to 22.22% (Table 11).

Because an initial analysis resulted in negative probabilities of capture, mark-recapture strata were pooled, reducing the recovery strata from 11 to 10 to increase the number of recoveries in each stratum. Additionally, the tagging strata were pooled into four strata. This pooled data set is displayed in Table 12. Because the X^2-test for equal proportions and complete mixing was significant (*P*-val<0.05), we reported the stratified Darroch estimate of 177,000 (SE 39,000), (95% confidence interval: 99,000–254,000) Chilkoot Lake sockeye salmon. The Darroch estimate was used because the two pooling tests performed by the SPAS program proved significant, indicating stratification was necessary.

The CDF of length for fish marked at the weir and fish sampled on the spawning grounds (combined strata) in 2003 were significantly different (Figure 9, bottom). Inspection of the CDF clearly shows that large fish were relatively more prevalent in weir or marking samples than in the spawning ground or recovery samples and indicates that probabilities of capture were not equal for fish of all sizes during marking or recovery events.

AGE, LENGTH AND SEX COMPOSITION

Historical age composition and length-at-age data for Chilkoot Lake sockeye salmon stocks is summarized in Tables 13 and 14. For clarity, the results of the individual years covered by this report are discussed separately.

1999

Age composition data for sockeye salmon captured from the Chilkoot River weir in 1999 indicated that age-1.3 fish were most prevalent; 46.5% (1982 to 2003 average 65.7%) of the sockeye salmon return to Chilkoot lake was of this age class (Table 13). Age-1.2 fish comprised 28.8% (1982 to 2003 average 10.4%), age-2.3, 16.3% (1982 to 2003 average 20.4%), and age-2.2, 8.1% (1982 to 2003 average 2.5%) of the run. There were very small compositions of age-1.4 and 2.4 fish.

Escapement data collected at Chilkoot Lake weir in 1999 indicated that male sockeye salmon were more prevalent (58.9%) than female sockeye (Appendix C1). Length composition information revealed that the average length for males sampled at the weir was 548 mm (MEF) and averaged 552 mm for females (MEF, Appendix D1). With the exception of the age 1.4 fish, average lengths by age class for the 1999 return were generally equal to or larger than the 1982 to 2003 averages (Table 14).

2000

Age composition data for sockeye salmon captured from the Chilkoot River weir indicated that age-1.3 fish were most prevalent; 58.6% (1982–2003 average 65.7%) of the sockeye salmon return to Chilkoot Lake was of this age class (Table 13). Age-2.3 fish comprised 26.1% (1982 to 2003 average 20.4%), age-1.2, 13.2% (1982 to 2003 average 10.4%), and age-2.2, 1.9% (1982 to 2003 average 2.5%) of the run. There were very small compositions of age-1.4 fish.

Escapement data collected at Chilkoot Lake weir in 2000 indicated that male sockeye salmon were slightly more prevalent (51.2%) than female sockeye (Appendix C1). Length composition information revealed that the average length for males sampled at the weir was 568 mm (MEF) and averaged 576 mm for females (MEF, Appendix D1). With the exception of the age 1.4 and age 2.4 fish, average lengths by age class for the 2000 return were generally larger than the 1982 to 2003 averages (Table 14).

2001

Age composition data for sockeye salmon captured from the Chilkoot River weir indicated that age-1.3 fish were most prevalent; 89.8% (1982 to 2003 average 65.7%) of the sockeye salmon return to Chilkoot Lake was of this age class (Table 13). This is the second highest percentage of this age class on record. Age-2.3 fish comprised 4.9% (1982 to 2003 average 20.4%), age-1.2, 4.8% (1982–2003 average 10.4%). There were very small compositions of age-0.3 and 2.2 fish.

Escapement data collected at Chilkoot Lake weir in 2001 indicated that female sockeye salmon were more prevalent (52.3%) than male sockeye (Appendix C1). Length composition information revealed that the average length for males sampled at the weir was 582 mm (MEF) and averaged 573 mm for females (MEF, Appendix D1). With the exception of the age-0.3 and 1.4 fish, average lengths by age class for the 2001 return were generally equal or larger than the 1982 to 2003 averages (Table 14).

2002

Age composition data for sockeye salmon captured from the Chilkoot River weir indicated that age-1.3 fish were most prevalent, 89.6% (1982 to 2003 average 65.7%) of the sockeye salmon return to Chilkoot lake was of this age class (Table 13). This is the third highest percentage of this age class on record. Age-1.2 fish comprised 6.4% (1982 to 2003 average 10.4%), age-2.3, 2.5% (1982 to 2003 average 20.4%). There were very small compositions of age-1.4 and 2.2 fish.

Escapement data collected at Chilkoot Lake weir in 2002 indicated that female sockeye salmon were slightly more prevalent (50.5%) than male sockeye (Appendix C1). Length composition information revealed that the average length for males sampled at the weir was 579 mm (MEF) and averaged 574 mm for females (MEF, Appendix D1). With the exception of the age-1.2 and 2.2 fish, average lengths by age class for the 2002 return were generally equal or larger than the 1982 to 2003 averages (Table 14).

2003

Age composition data for sockeye salmon captured from the Chilkoot River weir indicated that age-1.2 and age-1.3 fish comprised nearly equal proportions of the 2003 return. Age-1.3 fish were most prevalent, 45.0% (1982 to 2003 average 65.7%) of the sockeye salmon return to Chilkoot lake was of this age class (Table 13). Age-1.2 fish comprised 41.3% (1982 to 2003 average 10.4%) of the return, the second highest percentage on record. Age-2.3 fish comprised 9.1% (1982 to 2003 average 20.4%) and age-2.2, 4.2% (1982 to 2003 average 2.5%).

Escapement data collected at Chilkoot Lake weir in 2003 indicated that female sockeye salmon were more prevalent (54.9%) than male sockeye (Appendix C1). Length composition information revealed that the average length for males sampled at the weir was 536 mm (MEF) and averaged 546 mm for females (MEF, Appendix D1). With the exception of the age-1.4 and 2.4 fish, average lengths by age class for the 2003 return were generally equal or larger than the 1982 to 2003 averages (Table 14).

DISCUSSION

When we estimated the abundance of adult sockeye salmon present in Chilkoot Lake, we assumed that: (a) marking of adult sockeye salmon was in proportion to their numbers immigrating through the weir over time; (b) no sockeye entered or left the lake between the marking and recovery events, or sockeye that made up the population of the capture strata had a non-zero probability of recapture during the recovery event; (c) no mark non-identification and no unaccounted mark induced mortality occurred; (d) the probability of recovering sockeye salmon was independent of its marked/unmarked status.

Any violation of the above assumptions could greatly bias the estimate. Weir counts themselves can only be biased low, observers can only count the fish they see. Factors that may cause

inaccurate weir counts of sockeye salmon at this project include difficult visual detection of passing fish during periods of high water or poor water clarity. Holes or "fish leaks" in the weir structure that allowed fish to escape undetected could result in failure to mark the migrating sockeye at a constant rate over time. This could result in a high mark–recapture estimate. An unaccounted for increase in mortality of marked fish because of handling would also cause the mark–recapture estimate to reflect a higher than observed abundance.

With respect to assumption (a), efforts were made to catch and mark fish at the weir in proportion to their abundance by marking 20% of the daily sockeye passage at the weir in 1999 and 10% in 2000–2003. This proportional marking plan was successfully implemented in 1999 and 2000. However, during the periods of the highest weir escapement in 2001, 2002 and 2003, the percentage of fish marked tended to decline to 7–8% of the escapement. Additionally, in 2003 there was a high water event in mid-August that resulted in no fish being either enumerated or marked during a 44-hour period.

The weir is frequently inspected for "leaks" or holes to prevent fish from passing undetected (assumption b). It is possible that some sockeye salmon had entered Chilkoot Lake before the weir was installed or entered the lake after the weir was pulled for the season. Bases on historical run timing, it is likely that the numbers of fish entering the lake before or after the weir was operational is very low (Appendix B1-B5). Personal observations of fish passage just after the weir was installed and before it was removed tend to confirm this assumption. Unobserved passage of sockeye salmon through gaps, or holes, in the weir was assumed minimal as well. When pickets were pulled at the counting station for the first time each morning a "pulse" of fish were counted through the gap in the weir. The rate of fish passage dwindled after one to two hours. This suggests that the weir was impeding fish passage but does not eliminate the possibility that some sockeye salmon passed through the weir uncounted.

All marks were easily recognizable at the spawning grounds and a specific crew was responsible for all recovery events at Chilkoot Lake thus minimizing variability in recovery mark detection (assumption c, part 1). To minimize the possibility that unaccounted mark-induced mortality occurred (assumption c, part 2), a recovery pen was used each year to allow fish the time needed to recuperate from the marking and sampling procedure before being released into the swift current of the river. The weir was also monitored to determine if any marked prespawn sockeye salmon washed up on the face of the weir. Any short-term mortality among marked sockeye that was discovered either in the pen or on the face of the weir was removed from the analysis. Unobserved short-term mortality is assumed minimal. This assumption is supported by holding studies conducted at Canyon Island on the Taku River, which suggest that short-term mortality due to tagging is negligible (McGregor, ADF&G, personal communication). Long term mortality resulting from the capture and marking process is difficult to assess. While it is not possible to definitively conclude that mortality of marked fish differs from unmarked fish, we have no information suggesting mark-induced mortality is an important factor in this ongoing study.

Mark–recapture estimates are valid only if all sockeye salmon have an equal probability of being marked or being recovered (assumption d). Fluctuating water conditions at the weir and spawning areas effect the ease with which sockeye can be enumerated, captured, marked and inspected for marks. Difference in location, timing, and methods used to recover marked fish may have resulted in different degrees of compliance with the assumption of equal proportions of marking and recovery over time.

The mark–recapture program for Chilkoot Lake sockeye salmon was initiated in 1996 and has been conducted annually since that time. Over the 1996–2003 time period there is a substantial variation in the relationship between the visual weir estimates of the sockeye salmon run and the mark–recapture program estimates. Within the eight years of this program's operation, the sockeye salmon escapement estimate determined by visual counting at the weir has fallen within the 95% normal confidence interval bounds of the mark–recapture estimate only twice, in 1996 and in 2002 (Table 15).

Although there is a tendency for proportionally fewer fish to be marked during the periods of greatest escapement, this difference is not substantial. The exclusion of jack salmon (less than or equal to 360 mm MEF length) from the analysis should serve to eliminate some of the possible variation between the estimates caused by the smaller fish squeezing through the pickets and avoiding visual enumeration. The graphs of the CDF of MEF lengths of sockeye (Figure 8) do indicate that the fish caught in the recapture events in 1999, 2000, and 2003 did tend to be substantially smaller than the fish sampled at the weir. The opposite was true in 2001. Although the graphs of the CDF of weir sampled and lake captured fish is 2002 appear to be very similar, the Kolmogorov-Smirnov test indicates that the lengths of the fish captured in the two sampling events were significantly different ($P<0.001$) because of the substantial sample sizes. This statistical difference may be of no practical significance. There was no change in weir sampling or lake recapture protocols to explain this year-to-year variation.

In general, the fish marked during the beginning to middle of the run were recovered at a higher rate than the fish marked later in the migration. It is likely that later migrating fish are not subject to sampling on spawning grounds simply because they are not present on the spawning grounds until much later in the fall season when sampling has ceased. Additionally, a change in weir procedures to include the measuring of all marked fish would allow for the stratification of the sample by size, and thus by age. It would then be possible to calculate separate escapement population estimates for smaller (younger) and larger (older) fish. If it is the case that a significant number of smaller sockeye are passing through the weir uncounted, thus violating the assumption that every fish has an equal probability of being marked, then the separation of the sample by size will at least allow for the mark–recapture estimate for the larger fish to be calculated with a reduction of this bias.

The mark-recapture experiments were initiated on Chilkoot Lake in an attempt to verify the weir counts and provide an alternate means to estimate escapement abundance of Chilkoot Lake sockeye. This project confirms the fact that weir counts alone are not a true representation of the sockeye escapement to Chilkoot Lake. These estimates are used to calculate total return and exploitation rates for this stock during these years.

The Chilkoot Lake weir is an integral part of ADF&G's stock assessment and management program for salmon in the upper Lynn Canal. Commercial fishery managers use a variety of data sources to adjust fishing times and areas in order to assure that escapement goals are met, if possible. These sources include the weir counts, foot surveys, and stock composition data from this program, together with fishery performance data from the drift gillnet fishery in Lynn Canal. Information from this project is used to determine if escapement goals are being attained, to assess the effects of various management decisions on escapement levels and to provide the data needed to reconstruct the run size of the Chilkoot Lake sockeye salmon return. Age and sex compositions of the escapements are monitored for any changes over the years that would give insight into the status of this stock and would allow assessment of the management strategy

pertaining to the Chilkoot sockeye salmon stock. Run reconstruction conducted over a number of years may provide a time series of data useful in the development of spawner-recruit relationships for the estimation of maximum sustainable yield, determination of biological escapement goals and forecasting of future returns.

RECOMMENDATIONS

1. Increase the frequency of weir maintenance to ensure that the weir remains "fish tight" throughout the season.
2. Measure every fish that is marked at the weir.
3. Make repairs to any damage at the weir site caused by scour early in the spring while the river level is low.
4. Dedicate more crew time towards increased recovery efforts at spawning locations to boost recovery sampling, especially late in the season.
5. Increase weir crew number or work hours during peak escapement period to the extent necessary to assure proportional marking throughout the run.
6. Continue to collect sex and size information from fish examined in the second event. Having this data would allow more rigorous testing for possible size and sex selectivity between the marking and recovery events, which could yield information on possible bias in the mark–recapture estimates.

ACKNOWLEDGMENTS

The authors would like to thank Dale Brandenburger, Lou Cenicola, Pierre Dufesne, Megan Sherman, and Brian White (ADF&G) for their efforts in operating the enumeration, marking and sampling weir at Chilkoot Lake. Additional thanks to David Folletti, Ethlyn Dunbar, Brian Elliott, Al Demartini, John Norton, Amy Robinson, Lane Taylor, John Orr, and Will Prisciandaro (ADF&G) who provided recovery sampling on the spawning grounds. Kristin Hathhorn, Tonya Clark, and Faith Lorentz provided invaluable office support. We would also like to thank Iris Frank in Douglas who processed and aged scales from sampled sockeye salmon, and Mark Olsen for his prompt responses to our requests for AWL data. Scott Kelley and Hal Geiger provided valuable editorial comments for this document. Jim Craig prepared the format and final typesetting for this report.

REFERENCES CITED

ADF&G (Alaska Department of Fish and Game). 1994. Length, sex, and sampling procedures for sampling using the ADF&G adult salmon age-length mark sense form version 3.0. Region I Informational Report No. 1J94-06, Juneau.

Arnason, A. N., C. W. Kirby, C. J. Schwarz, and J. R. Irvine. 1996. Computer analysis of data from stratified mark–recovery experiments for estimation of salmon escapements and other populations. Canadian Technical Report of Fisheries and Aquatic Sciences. 2106: 37.

Bachman R. L. and A. J. McGregor. 2001. Stock assessment studies of Chilkat River salmon stocks in 1999. Alaska Department of Fish and Game, Division of Commercial Fisheries, Division of Commercial Fisheries, Regional Information Report No. 1J01-36. Juneau.

Bergander, F. 1985. Analysis of Lynn Canal sockeye salmon (*Oncorhynchus nerka*) brood year returns, 1976 through 1982. Alaska Department of Fish and Game, Informational Leaflet No. 245. 1p. Juneau.

Bugliosi, E. F. 1988. Hydrologic reconnaissance of the Chilkat River Basin, Southeast Alaska. U.S. Geological Survey, Water Resources Investigations Report 88-4023.

REFERENCES CITED (Continued)

Chapman, D. G. and C. O. Junge. 1956. The estimation of the size of a stratified animal population. Annals of Mathematical Statistics. 27:375–389.

Darroch, J. N. 1961. The two-sample capture-recapture census when tagging and sampling are stratified. Biometrika. 48:241–260.

Ericksen, R. P. and A. E. Bingham. 1990. Harvest estimates for selected roadside sport fisheries in Haines, Alaska, 1989. Alaska Department of Fish and Game, Fishery Data Series No. 90-35, Anchorage.

Ericksen, R. P. and R. P. Marshall. 1991. Harvest estimates for the Chilkoot River roadside sport fishery, Haines, Alaska, 1990. Alaska Department of Fish and Game, Fishery Data Series No. 91-45, Anchorage.

Kelley, M. S. and R. P. Josephson. 1997. Sitkoh Creek weir results, June 8 to September 7, 1998. Alaska Department of Fish and Game, Regional Information Report 1J97-05, Juneau.

Kelley M. S. and R. L. Bachman. 1999. Chilkoot River weir results in 1998. Alaska Department of Fish and Game, Region I Informational Report No. 1J99-25, Juneau.

Marshall, S. L., S. A. McPherson, and S. Sharr. 1982. Origins of sockeye salmon (*Oncorhynchus nerka*) in the Lynn Canal drift gillnet fishery of 1981 based on scale pattern analysis. Alaska Department of Fish and Game, Technical Data Report No. 75, Juneau

McGregor, A. J. and F. Bergander. 1993. Crescent lake sockeye salmon mark–recapture studies, 1991. Alaska Department of Fish and Game, Regional Information Report No. 1J93-13, Juneau.

McPherson, S. A., A. J. McGregor, and S. L. Marshall. 1983. Origins of sockeye salmon (*Oncorhynchus nerka*) in the Lynn Canal drift gillnet fishery of 1982 based on scale pattern analysis. Alaska Department of Fish and Game, Technical Data Report No. 87, Juneau.

McPherson, S. A. and S. L. Marshall. 1986. Contribution, exploitation, and migratory timing of Chilkat and Chilkoot River runs of sockeye salmon (*Oncorhynchus nerka*) in the Lynn Canal drift gillnet fishery of 1983. Alaska Department of Fish and Game, Technical Data Report No. 165, Juneau.

McPherson, S. A. 1987. Contribution, exploitation, and migratory timing of Chilkat and Chilkoot River runs of sockeye salmon (*Oncorhynchus nerka*) in the Lynn Canal drift gillnet fishery of 1984. Alaska Department of Fish and Game, Technical Data Report No. 198, Juneau.

McPherson, S. A. 1989. Contribution, exploitation, and migratory timing of Lynn Canal sockeye salmon runs in 1987 based on analysis of scale patterns. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report No. 1J89-18, Juneau.

McPherson, S. A. 1990. An in-season management system for sockeye salmon returns to Lynn Canal, southeast Alaska. Masters of Science Thesis, University of Alaska , Fairbanks.

McPherson, S. A., F. E. Bergander, M. A. Olsen, and R. R. Riffe. 1992. Contribution, exploitation, and migratory timing of Lynn Canal sockeye salmon runs in 1989 based on analysis of scale patterns. Alaska Department of Fish and Game, Division of Commercial Fisheries, Technical Fishery Report No. 92–21, Juneau.

Plante, N. 1990. Estimation de la taille d'une population animale à l'aide d'une modèle de capture–recapture avec stratification. M.Sc. thesis, Université Laval, Quebec.

Shaul, L. 1994. A summary of 1982–1991 harvest escapements, migratory patterns, and marine survival rates of coho salmon stocks in Southeast Alaska. Alaska Department of Fish and Game. Alaska Fishery Research Bulletin. 1(1):10–34, Juneau.

Suchanek, P. M., S. H. Hoffman, R. E. Chadwick, D. E. Beers, T. E. Brookover, M. W. Schwan, R. P. Ericksen, R. E. Johnson, B. J. Glynn, and R. W. Bentz. 2001 a. Area management report for the sport fisheries of Southeast Alaska, 1998. Alaska Department of Fish and Game, Fishery Management Report No. 01-10, Anchorage.

Suchanek, P. M., S. H. Hoffman, R. E. Chadwick, D. E. Beers, T. E. Brookover, M. W. Schwan, R. P. Ericksen, R. E. Johnson, B. J. Glynn, and R. W. Bentz. 2001 b. Area management report for the sport fisheries of Southeast Alaska, 1999. Alaska Department of Fish and Game, Fishery Management Report No. 01-11, Anchorage.

TABLES AND FIGURES

Table 1.–Dates of operation and total weir counts by species for Chilkoot River weir, 1976 through 2003.

Year	Dates	Chinook	Sockeye	Coho	Pink	Chum
1976	5/29–11/04	n/a	71,297	991	n/a	241
1977	5/28–9/18	n/a	97,051	42	5,377	193
1978	6/06–11/08	n/a	35,454	1,091	111	382
1979	6/09–11/04	n/a	95,946	899	n/a	253
1980	6/15–10/04	n/a	96,512	628	4,683	719
1981	6/10–10/12	n/a	83,372	1,579	41,222	367
1982	6/03–9/14	1	102,973	5	6,665	507
1983	6/04–11/12	0	80,343	1,844	11,237	501
1984	6/03–9/14	0	100,417	321	5,034	372
1985	6/05–10/28	5	69,026	2,202	33,608	1,031
1986	6/04–10/28	6	88,024	1,966	1,303	454
1987	6/04–11/02	3	95,185	560	6,689	431
1988	6/09–11/12	1	81,274	1,476	5,274	450
1989	6/03–10/30	4	54,900	3,998	2,193	225
1990	6/03–10/30	0	73,324	988	10,398	216
1991	6/07–10/08	0	90,638	4,000	2,588	357
1992	6/02–9/26	1	67,071	1,518	7,836	193
1993	6/03–9/30	204	51,827	322	357	240
1994	6/04–9/24	118	37,416	463	22,472	214
1995	6/05–9/10	7	7,209	95	1,243	99
1996	6/06–9/11	19	50,739	86	2,867	305
1997	6/04–9/09	6	44,254	17	26,197	267
1998	6/04–9/13	11	12,335	131	44,001	368
1999	6/02–9/13	27	19,284	11	62,370	747
2000	6/03–9/12	10	43,555	47	23,636	1,050
2001	6/07–9/12	24	76,283	103	32,294	810
2002	6/08–9/11	36	58,361	304	79,639	352
2003	6/06–9/09	12	74,459	15	55,424	498
Average		23	66,376	918	19,028	422
Minimum		0	7,209	5	111	99
Maximum		204	102,973	4,000	62,370	1,031

n/a = not applicable

Table 2.–Annual weir counts of Chilkoot Lake sockeye salmon by week, 1976–2003.

Date	Stat Week	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
6/05	23	124	14	844	3	0	0	0	0	333	8	25	11	0	571	328
6/12	24	623	9,572	1,957	8,738	0	25	252	467	3,349	6	101	176	95	4,266	2,060
6/19	25	241	35,751	1,368	2,730	391	1,108	12,220	2,764	11,100	104	163	198	1,082	21,300	2,778
6/26	26	3,579	11,150	274	469	1,157	2,177	9,440	8,860	7,444	4,681	224	16,583	1,506	2,466	12,190
7/03	27	735	3,361	6,677	407	1,824	559	2,623	4,062	4,406	783	857	6,879	22,846	1,009	1,893
7/10	28	397	6,970	1,311	309	2,241	606	1,981	3,304	9,993	463	3,650	3,365	5,872	913	1,980
7/17	29	1,752	1,844	2,526	95	5,894	7,346	5,095	4,090	6,738	810	2,328	7,000	4,389	2,122	0
7/24	30	4,091	1,854	7,650	2,871	9,239	15,951	17,574	21,548	11,917	3,601	5,467	8,134	2,554	2,942	4,989
7/31	31	28,061	9,016	3,465	22,765	8,294	9,006	20,806	12,747	9,610	19,778	11,438	8,998	5,416	3,614	1,853
8/07	32	13,587	9,561	5,157	31,000	20,860	9,963	13,358	4,507	8,020	9,832	21,563	9,944	5,824	4,313	1,995
8/14	33	11,827	6,059	2,316	16,091	21,333	15,631	8,287	3,614	5,522	12,501	12,276	5,899	5,683	2,157	4,255
8/\21	34	5,205	1,019	1,469	5,140	12,968	10,659	4,938	2,720	11,185	7,013	11,839	16,978	10,851	2,793	13,553
8/28	35	346	372	155	3,880	10,669	5,028	2,655	3,016	3,435	4,432	6,348	6,018	6,650	3,067	13,734
9/04	36	49	403	56	933	1,077	4,519	1,518	4,366	4,474	2,817	5,416	3,918	4,544	1,840	9,147
9/11	37	118	103	106	427	479	794	1,404	2,604	2,891	1,546	5,071	738	2,646	876	2,128
9/18	38	410	2	83	8	45		822	1,070		480	762	217	759	232	365
9/25	39	142		12	70	36			502		145	409	112	381	216	5
10/02	40–42	10		28	10	5			102		26	87	17	176	203	71
Yearly Total		71,297	97,051	35,454	95,946	96,512	83,372	102,973	80,343	100,417	69,026	88,024	95,185	81,274	54,900	73,324
Weekly Mean		3,961	6,066	1,970	5,330	5,362	5,558	6,436	4,464	6,694	3,835	4,890	5,288	4,515	3,050	4,074
Early-stock Esc.		6,737	69,268	10,349	13,026	14,196	8,144	29,127	21,547	37,488	9,425	17,209	29,141	30,765	29,560	21,229
Late-stock Esc.		64,560	27,783	25,105	82,920	82,317	75,229	73,846	58,796	62,929	59,601	70,815	66,044	50,509	25,340	52,095

-continued-

Table 2.–Page 2 of 2.

Date	Stat Week	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	1976–03 Average	1994–03 Average
6/05	23	1	31	65	309	185	0	873	0	1	0	89	102	15	140	157
6/12	24	471	4,744	249	2687	295	129	2317	117	59	174	265	2,005	342	1,626	839
6/19	25	5,599	8,775	2,592	1,117	243	459	6,677	327	143	413	2,811	2,451	448	4,477	1,509
6/26	26	3,083	2,310	5,431	4,752	342	1,418	3,433	664	521	2,494	4,171	3,195	1,165	4,114	2,215
7/03	27	2,097	8,450	2,306	4,170	317	1,956	1,407	857	1,980	2,208	3,125	1,869	2,805	3,302	2,069
7/10	28	2,528	975	5,883	4,241	298	4,393	3,143	676	884	2,558	3,083	4,138	4,074	2,865	2,749
7/17	29	5,436	1,222	3,488	1,141	325	2,482	2,440	791	668	3,385	7,953	6,193	7,207	3,384	3,259
7/24	30	21,990	2,902	5,021	2,123	1,517	12,040	4,805	1,534	1,734	5,154	11,168	10,433	11,437	7,580	6,195
7/31	31	17,870	9,488	5,864	5,158	1,731	9,163	3,919	1,687	2,706	4,756	21,480	7,599	21,041	10,262	7,924
8/07	32	7,317	7,173	6,807	1,342	417	6,743	3,524	1,924	1,864	6,359	11,231	4,775	14,103	8,681	5,228
8/14	33	8,229	10,572	4,298	2,140	545	3,867	2,606	1,352	1,041	6,344	5,094	2,994	5,677	6,722	3,166
8/21	34	4,115	2,530	4,857	3,220	237	2,655	4,246	1,217	1,108	2,699	2,320	4,764	1,251	5,484	2,372
8/28	35	5,077	3,531	2,222	2,736	270	2,919	2,880	678	3,058	3,067	2,064	3,322	3,564	3,757	2,456
9/04	36	3,988	2,549	899	1,656	472	1,081	1,540	261	2,262	3,246	1,182	3,716	902	2,458	1,632
9/11	37	1,879	1,200	1,427	624	15	969	444	216	990	559	247	805	428	1,133	530
9/18	38	416	346	418			465		34	265	139				367	226
9/25	39	294	273												200	
10/02	40–42	248													82	
Yearly Total		90,638	67,071	51,827	37,416	7,209	50,739	44,254	12,335	19,284	43,555	76,283	58,361	74,459	66,376	42,389
Weekly Mean		5,035	3,945	3,239	2,494	481	3,171	2,950	771	1,205	2,722	5,086	3,891	4,964	3,980	2,774
Early-stock Esc.		13,779	25,285	16,526	17,276	1,680	8,355	17,850	2,641	3,588	7,847	13,544	13,760	8,849	17,793	9,539
Late-stock Esc.		76,859	41,786	35,301	20,140	5,529	42,384	26,404	9,694	15,696	35,708	62,739	44,601	65,610	48,584	32,851

Note: The early and late-stock escapement numbers for the years 1976 through 1989 were taken from the following publication: McPherson, S. A. 1990. An in-season management system for sockeye salmon returns to Lynn Canal, Southeast Alaska. Masters of Science Thesis, University of Alaska, Fairbanks.

Table 3.–Annual harvests of Chilkoot Lake sockeye salmon in the District 115 drift gillnet fishery by week, 1976–2003.

Mid-Week Date	Stat Week	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
6/14	25	242		2,428	2,072	921	2,286	2,217		2,173	526	251			5,673	2,284
6/21	26	2,891	22,024	733	1,719	322	2,078	3,832	1,315	6,760	2,294	423	4,838	4,591	12,640	2,546
6/28	27	2,457	17,624		2,425		1,750	4,349	2,574	7,686	2,589	2,135	16,332	5,961	12,466	8,019
7/05	28	2,953	13,860	1,093	11,723		2,740	5,325	3,882	8,885	6,463	1,035	4,660	14,662	27,293	7,958
7/12	29	3,087	16,535	2,458	1,002		9,464	5,585	3,839	21,330	2,046	1,697	44,328	25,161	43,692	13,233
7/19	30	6,006	8,698	1,523	5,193	945	8,159	11,347	19,770	49,673	4,595	2,342	46,056	22,721	34,439	41,331
7/26	31	2,422	11,583	2,883	7,114	1,931	11,679	36,013	49,231	47,278	17,492	2,068	42,042	48,921	61,509	29,768
8/02	32	23,153	11,734	971	25,146	6,974	2,165	28,481	40,832	37,997	23,836	7,901	85,999	40,664	43,957	34,731
8/09	33	2,424	6,773	1,133	5,786	6,955	1,578	21,656	41,120	20,685	19,764	21,361	41,439	43,995	33,639	28,539
8/16	34	2,381	3,803	738	4,879	1,293	952	16,192	22,533	15,902	48,615	37,864	32,383	14,181	8,205	
8/23	35	13,008	511	204	1,921	1,302	539	8,310	28,181	9,903	12,833	20,961	13,503	21,734	5,245	4,758
8/30	36	808	124	80	446	128	232	754	21,668	2,980	9,550	9,762	2,537	8,951	2,497	3,068
9/06	37	419	26	17	207	39	121	461	5,190	367	1,271	2,206	728	1,931	369	2,440
9/13	38–42	201	18	3	231	36	49	70	1,334	173	451	424	150	495	239	189
Yearly Total		62,000	113,000	14,000	70,000	21,000	44,000	145,000	241,000	232,000	152,000	110,000	335,000	254,000	292,000	179,000
Early-stock Catch		8,543	53,508	4,254	17,939	1,243	8,854	15,723	7,771	25,504	11,872	3,844	25,830	25,214	58,072	20,807
Late-stock Catch		53,909	59,805	10,010	51,925	19,603	34,938	128,869	233,698	206,288	140,453	106,586	309,165	228,754	233,791	158,057

-continued-

Table 3.–Page 2 of 2.

Mid-Week Date	Stat Week	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	1994–03 Average	1976–03 Average
6/14	25	2,701				1,504	1,403	6,934				1,117	976	261	2,032	1,998
6/21	26	4,103	7,116	7,692	3,879	1,165	3,971	5,352	160	338	143	4,854	923	464	2,125	3,899
6/28	27	2,933	12,867	9,424	4,682	1,015	1,618	4,492	112	201	592	6,840	2,236	1,285	2,307	5,179
7/05	28	6,536	9,143	6,134	2,763	1,866	1,594	1,682	233	386	2,138	5,026	3,319	1,714	2,072	5,743
7/12	29	8,095	14,276	5,786	2,619	744	578	2,322	450	658	2,772	12,166	3,791	769	2,687	9,203
7/19	30	8,141	13,654	3,724	1,228	237	779	3,061	330	450	2,392	10,266	2,665	1,186	2,259	11,104
7/26	31	35,267	13,496	4,510	2,400	213	3,355	4,293	380	342	3,810	10,375	3,491	7,308	3,597	16,470
8/02	32	49,985	18,479	2,502	2,609	144	2,983	251	167	769	799	13,110	4,947	10,154	3,593	18,623
8/09	33	36,144	19,574	3,500	2,291	250	1,346	180	117	288	913	3,284	1,054	6,043	1,577	13,280
8/16	34	37,354	12,852	3,089	1,298	396	525	159	76	270	323	203	577	1,637	546	9,951
8/23	35	19,334	12,929	2,214	904	232	444	117	140	0	129	140	126	522	275	6,434
8/30	36	7,322	4,612	2,131	526	90	145	48	19	255	48	85	134	728	208	2,847
9/06	37	5,089	1,503	583	97	61	87	24	21	235	42	24	34	229	85	851
9/13	38–42	1,037	218	135	119	29	34	0		66	32	12	4	24	36	214
Yearly Total		224,000	141,000	51,000	25,000	8,000	19,000	29,000	2,000	4,300	14,000	68,000	24,000	32,000	23,000	104,000
Early-stock Catch		16,273	29,126	23,250	11,323	5,550	8,586	18,459	505	925	2,873	17,838	7,454	3,724	7,724	15,531
Late-stock Catch		207,768	111,593	28,174	14,091	2,396	10,275	10,454	1,701	3,333	11,260	49,664	16,822	28,600	14,860	88,285

Table 4.–Chilkoot sockeye salmon annual weir counts, mark-recapture estimates, commercial harvest, sport harvest, subsistence harvest, total return by escapement method in thousands of fish and estimated exploitation rates by escapement method, 1976–2003.

Year	Weir Count	M-R Estimate[a]	Commercial Harvest	Sport Harvest[b]	Subsistence Harvest	Total Return Weir count	Total Return M-R[a]	Weir count Exploitation Rate (%)	M-R Exploitation Rate (%)[a]
1976	71.3		62.5	-	-	133.8		46.7%	
1977	97.1		113.3	0.4	-	210.8		53.9%	
1978	35.5		14.3	0.5	-	50.3		29.5%	
1979	95.9		69.9	0.3	-	166.1		42.3%	
1980	96.5		20.8	0.7	-	118.0		18.2%	
1981	83.4		43.8	1.2	-	128.4		35.1%	
1982	103.0		144.6	7.6	-	255.2		59.6%	
1983	80.3		241.5	6.5	-	328.3		75.5%	
1984	100.4		231.8	9.9	-	342.1		70.6%	
1985	69.0		152.3	1.1	1.1	223.5		69.1%	
1986	88.0		110.4	3.0	1.6	203.1		56.7%	
1987	95.2		334.9	1.7	1.2	433.0		78.0%	
1988	81.3		253.9	0.3	1.0	336.5		75.8%	
1989	54.9		291.9	0.9	2.1	349.8		84.3%	
1990	73.3		178.9	2.6	2.4	257.2		71.5%	
1991	90.6		224.0	0.6	4.5	319.8		71.7%	
1992	67.1		140.7	0.5	4.1	212.4		68.4%	
1993	51.8		51.4	0.1	2.9	106.3		51.2%	
1994	37.4		25.4	0.4	1.6	64.8		42.3%	
1995	7.2		7.9	0.2	0.4	15.6		53.9%	
1996	50.7	65.0	18.9	0.4	2.3	72.3	**86.6**	29.8%	**24.9%**
1997	44.3	79.0	28.9	0.5	1.8	75.4	**110.2**	41.3%	**28.3%**
1998	12.3	28.0	2.2	0.0	0.2	14.7	**30.4**	16.1%	**7.8%**
1999	19.3	62.0	4.3	0.0	0.1	23.7	**66.4**	18.7%	**6.7%**
2000	43.6	60.0	14.7	0.4	0.3	58.9	**75.3**	26.0%	**20.3%**
2001	76.3	100.0	66.4	2.3	1.5	146.4	**170.2**	47.9%	**41.2%**
2002	58.4	61.0	24.3	1.5	1.3	85.4	**88.0**	31.7%	**30.7%**
2003	74.5	177.0	32.3	2.5	2.0	111.2	**213.8**	33.0%	**17.2%**
1976–2003	66.4		103.8	1.7	1.7	173.0		50.0%	
1994–2003	42.4		22.5	0.8	1.1	66.8		34.1%	

[a] Official escapement estimates, total return and exploitation rates for years 1996 through 2003 are based on mark-recapture techniques (bolded numbers).

[b] Source Ericksen and Bingham 1990; Ericksen and Marshall 1991. The 1976 sport harvest is unknown. No sport harvest occurred during 1998 and 1999 as the sport fishery was closed during these years.

Table 5.–Chilkoot Lake sockeye salmon subsistence harvest, 1999–2003 and sport fish harvest, 1998–2002.

Chilkoot Subsistence Harvest, 1999–2003						
Year	**Permits**	**Chinook**	**Sockeye**	**Coho**	**Pink**	**Chum**
1999	5	0	115	3	0	5
2000	22	0	251	22	111	29
2001	81	11	1,499	3	245	25
2002	84	8	1,258	7	312	21
2003	101	5	1,985	13	627	66
Average	59	5	1,022	10	259	29

Note: Reported harvests from Chilkoot and Lutak Inlets.

Chilkoot Lake Sockeye Salmon Sport Harvest			
Year	**Chilkoot Lake**	**Chilkoot River**	**Total**
1998	0	0	0
1999	6	21	27
2000	27	357	384
2001	88	2,256	2,344
2002	23	1,480	1,503
Total	144	4,114	4,258
Average (2000 to 2002)	46	1,364	1,410

Note: Emergency closures in 1998 and 1999 limited the sport fishing harvest of Chilkoot Lake sockeye salmon.

Table 6.–Chilkoot River weir dates of operation, 1999–2003.

Year	Dates of Operation
1999	6/02–9/13
2000	6/03–9/12
2001	6/07–9/12
2002	6/08–9/11
2003	6/06–9/09

Table 7.–Chilkoot River weir secondary marking schedule for sockeye salmon, 1999–2003.

1999 and 2000		2001	
Stat Weeks[a]	**Secondary Mark**	**Stat Weeks[a]**	**Secondary Mark**
23–27	Dorsal Clip	23–28	Dorsal Clip
28–31	Left Ventral Clip	29–31	Left Ventral Clip
32–end	Left Axillary Clip	32–end	Left Axillary Clip

	2002	2003
Stat Weeks[a]	**Secondary Mark**	**Secondary Mark**
23–24	Dorsal Clip	Adipose Clip Only
25–26	Left Ventral Clip	Right Axillary Clip
27–28	Right Ventral Clip	Left Axillary Clip
29–30	Left Axillary Clip	Right Ventral clip
31–32	Right Axillary Clip	Left Ventral Clip
33–34	Left Pectoral Clip	Dorsal Clip
35–36	Right Pectoral Clip	Right Pectoral Clip
36–end	Right Lower Operculum Punch	Left Pectoral Clip

[a] Description of Statistical Weeks is contained in Appendix A1.

Table 8.–Weekly and cumulative total sockeye salmon Chilkoot River weir counts compared to biological escapement goals, 1999–2003.

1999 EARLY-STOCK

Stat Week	Chilkoot Weekly 1999 Escapement[a]	Observed 1999 Cumulative	Weekly Goal	Cumulative Goal	Cumulative Lower Bound	Cumulative Upper Bound
23	1	1	450	450	337	644
24	59	60	2,419	2,868	2,151	4,107
25	143	203	5,320	8,189	6,142	11,725
26	521	724	6,021	14,209	10,657	20,346
27	1,980	2,704	4,310	18,519	13,890	26,517
28	884	3,588	3,480	22,000	16,500	31,500

Total Early-stock Biological Escapement Goal	22,000
Upper Biological Escapement Goal Range	31,500
Lower Biological Escapement Goal Range	16,500

1999 LATE-STOCK

Stat Week	Chilkoot Weekly 1999 Escapement[a]	Observed 1999 Cumulative	Weekly Goal	Cumulative Goal	Cumulative Lower Bound	Cumulative Upper Bound
29	668	668	532	532	452	798
30	1,734	2,402	6,308	6,840	5,814	10,260
31	2,706	5,108	8,442	15,282	12,990	22,923
32	1,864	6,972	8,936	24,218	20,585	36,327
33	1,041	8,013	6,302	30,520	25,942	45,780
34	1,108	9,121	4,720	35,240	29,954	52,860
35	3,058	12,179	2,880	38,120	32,402	57,180
36	2,262	14,441	1,280	39,400	33,490	59,100
37	990	15,431	440	39,840	33,864	59,760
38	265	15,696	160	40,000	34,000	60,000
39	0	15,696	0	40,000	34,000	60,000
40	0	15,696	0	40,000	34,000	60,000

Total Late-stock Biological Escapement Goal	40,000	Total Late and Early-stock Point Biological Escapement Goal	62,000
Upper Biological Escapement Goal Range	60,000	Upper Biological Escapement Goal Range	91,500
Lower Biological Escapement Goal Range	34,000	Lower Biological Escapement Goal Range	50,500

-continued-

Table 8.–Page 2 of 5.

2000 EARLY-STOCK

Stat Week	Chilkoot Weekly 2000 Escapement[a]	Observed 2000 Cumulative	Weekly Goal	Cumulative Goal	Cumulative Lower Bound	Cumulative Upper Bound
23	0	0	450	450	337	644
24	174	174	2,419	2,868	2,151	4,107
25	413	587	5,320	8,189	6,142	11,725
26	2,494	3,081	6,021	14,209	10,657	20,346
27	2,208	5,289	4,310	18,519	13,890	26,517
28	2,558	7,847	3,480	22,000	16,500	31,500

Total Early-stock Biological Escapement Goal	22,000
Upper Biological Escapement Goal Range	31,500
Lower Biological Escapement Goal Range	16,500

2000 LATE-STOCK

Stat Week	Chilkoot Weekly 2000 Escapement[a]	Observed 2000 Cumulative	Weekly Goal	Cumulative Goal	Cumulative Lower Bound	Cumulative Upper Bound
29	3,385	3385	532	532	452	798
30	5,154	8,539	6,308	6,840	5,814	10,260
31	4,756	13,295	8,442	15,282	12,990	22,923
32	6,359	19,654	8,936	24,218	20,585	36,327
33	6,344	25,998	6,302	30,520	25,942	45,780
34	2,699	28,697	4,720	35,240	29,954	52,860
35	3,067	31,764	2,880	38,120	32,402	57,180
36	3,246	35,010	1,280	39,400	33,490	59,100
37	559	35,569	440	39,840	33,864	59,760
38	139	35,708	160	40,000	34,000	60,000
39	0	35,708	0	40,000	34,000	60,000
40	0	35,708	0	40,000	34,000	60,000

Total Late-stock Biological Escapement Goal	40,000	Total Late and Early-stock Point Biological Escapement Goal	62,000
Upper Biological Escapement Goal Range	60,000	Upper Biological Escapement Goal Range	91,500
Lower Biological Escapement Goal Range	34,000	Lower Biological Escapement Goal Range	50,500

-continued-

Table 8.–Page 3 of 5.

2001 EARLY-STOCK

Stat Week	Chilkoot Weekly 2001 Escapement[a]	Observed 2001 Cumulative	Weekly Goal	Cumulative Goal	Cumulative Lower Bound	Cumulative Upper Bound
23	89	89	450	450	337	644
24	265	354	2,419	2,868	2,151	4,107
25	2,811	3,165	5,320	8,189	6,142	11,725
26	4,171	7,336	6,021	14,209	10,657	20,346
27	3,125	10,461	4,310	18,519	13,890	26,517
28	3,083	13,544	3,480	22,000	16,500	31,500

Total Early-stock Biological Escapement Goal	22,000
Upper Biological Escapement Goal Range	31,500
Lower Biological Escapement Goal Range	16,500

2001 LATE-STOCK

Stat Week	Chilkoot Weekly 2001 Escapement[a]	Observed 2001 Cumulative	Weekly Goal	Cumulative Goal	Cumulative Lower Bound	Cumulative Upper Bound
29	7,953	7953	532	532	452	798
30	11,168	19,121	6,308	6,840	5,814	10,260
31	21,480	40,601	8,442	15,282	12,990	22,923
32	11,231	51,832	8,936	24,218	20,585	36,327
33	5,094	56,926	6,302	30,520	25,942	45,780
34	2,320	59,246	4,720	35,240	29,954	52,860
35	2,064	61,310	2,880	38,120	32,402	57,180
36	1,182	62,492	1,280	39,400	33,490	59,100
37	247	62,739	440	39,840	33,864	59,760
38	0	62,739	160	40,000	34,000	60,000
39	0	62,739	0	40,000	34,000	60,000
40	0	62,739	0	40,000	34,000	60,000

Total Late-stock Biological Escapement Goal	40,000	Total Late and Early-stock Point Biological Escapement Goal	62,000
Upper Biological Escapement Goal Range	60,000	Upper Biological Escapement Goal Range	91,500
Lower Biological Escapement Goal Range	34,000	Lower Biological Escapement Goal Range	50,500

-continued-

Table 8.–Page 4 of 5.

2002 EARLY-STOCK

Stat Week	Chilkoot Weekly 2002 Escapement[a]	Observed 2002 Cumulative	Weekly Goal	Cumulative Goal	Cumulative Lower Bound	Cumulative Upper Bound
23	102	102	450	450	337	644
24	2,005	2,107	2,419	2,868	2,151	4,107
25	2,451	4,558	5,320	8,189	6,142	11,725
26	3,195	7,753	6,021	14,209	10,657	20,346
27	1,869	9,622	4,310	18,519	13,890	26,517
28	4,138	13,760	3,480	22,000	16,500	31,500

Total Early-stock Biological Escapement Goal	22,000
Upper Biological Escapement Goal Range	31,500
Lower Biological Escapement Goal Range	16,500

2002 LATE-STOCK

Stat Week	Chilkoot Weekly 2002 Escapement[a]	Observed 2002 Cumulative	Weekly Goal	Cumulative Goal	Cumulative Lower Bound	Cumulative Upper Bound
29	6,193	6193	532	532	452	798
30	10,433	16,626	6,308	6,840	5,814	10,260
31	7,599	24,225	8,442	15,282	12,990	22,923
32	4,775	29,000	8,936	24,218	20,585	36,327
33	2,994	31,994	6,302	30,520	25,942	45,780
34	4,764	36,758	4,720	35,240	29,954	52,860
35	3,322	40,080	2,880	38,120	32,402	57,180
36	3,716	43,796	1,280	39,400	33,490	59,100
37	805	44,601	440	39,840	33,864	59,760
38	0	44,601	160	40,000	34,000	60,000
39	0	44,601	0	40,000	34,000	60,000
40	0	44,601	0	40,000	34,000	60,000

Total Late-stock Biological Escapement Goal	40,000	Total Late and Early-stock Point Biological Escapement Goal	62,000
Upper Biological Escapement Goal Range	60,000	Upper Biological Escapement Goal Range	91,500
Lower Biological Escapement Goal Range	34,000	Lower Biological Escapement Goal Range	50,500

-continued-

Table 8.–Page 5 of 5.

2003 EARLY-STOCK

Stat Week	Chilkoot Weekly 2003 Escapement[a]	Observed 2003 Cumulative	Weekly Goal	Cumulative Goal	Cumulative Lower Bound	Cumulative Upper Bound
23	15	15	450	450	337	644
24	342	357	2,419	2,868	2,151	4,107
25	448	805	5,320	8,189	6,142	11,725
26	1,165	1,970	6,021	14,209	10,657	20,346
27	2,805	4,775	4,310	18,519	13,890	26,517
28	4,074	8,849	3,480	22,000	16,500	31,500

Total Early-stock Biological Escapement Goal	22,000
Upper Biological Escapement Goal Range	31,500
Lower Biological Escapement Goal Range	16,500

2003 LATE-STOCK

Stat Week	Chilkoot Weekly 2003 Escapement[a]	Observed 2003 Cumulative	Weekly Goal	Cumulative Goal	Cumulative Lower Bound	Cumulative Upper Bound
29	7,207	7207	532	532	452	798
30	11,437	18,644	6,308	6,840	5,814	10,260
31	21,041	39,685	8,442	15,282	12,990	22,923
32	14,103	53,788	8,936	24,218	20,585	36,327
33	5,677	59,465	6,302	30,520	25,942	45,780
34	1,251	60,716	4,720	35,240	29,954	52,860
35	3,564	64,280	2,880	38,120	32,402	57,180
36	902	65,182	1,280	39,400	33,490	59,100
37	428	65,610	440	39,840	33,864	59,760
38	0	65,610	160	40,000	34,000	60,000
39	0	65,610	0	40,000	34,000	60,000
40	0	65,610	0	40,000	34,000	60,000

Total Late-stock Biological Escapement Goal	40,000	Total Late and Early-stock Point Biological Escapement Goal	62,000
Upper Biological Escapement Goal Range	60,000	Upper Biological Escapement Goal Range	91,500
Lower Biological Escapement Goal Range	34,000	Lower Biological Escapement Goal Range	50,500

[a] Based on visual counts from the Chilkoot River weir.

Table 9.–Weekly passage and marking data from the 1999–2003 Chilkoot River sockeye salmon mark–recapture program.

Stat Week	Weekly Weir Passage	Cum Weekly Weir passage	Weekly Sockeye Marked	Cum Weekly Sockeye Marked	Percent Weekly Marked	Percent Cum Marked	Total Marked by Stratum [a, b]		Marking Mortality Observed at Weir	Stat Weeks	Percent Marked by Stratum
1999											
23	1	1									
24	59	60	19	19	32.2	31.7	DC	548		23-27	20.3
25	143	203	29	48	20.3	23.6	LV	1,270		28-31	21.2
26	521	724	104	152	20.0	21.0	LA	2,118	16	32-38 [c]	20.0
27	1,980	2,704	396	548	20.0	20.3					
28	884	3,588	206	754	23.3	21.0					
29	668	4,256	165	919	24.7	21.6					
30	1,734	5,990	357	1,276	20.6	21.3					
31	2,706	8,696	542	1,818	20.0	20.9					
32	1,864	10,560	366	2,184	19.6	20.7					
33	1,041	11,601	212	2,396	20.4	20.7					
34	1,108	12,709	228	2,624	20.6	20.6					
35	3,058	15,767	604	3,228	19.8	20.5					
36	2,262	18,029	465	3,693	20.6	20.5					
37	990	19,019	201	3,894	20.3	20.5					
38	265	19,284	58	3,952	21.9	20.5					
Total		19,284	3,952		20.5						
2000											
23											
24	174	174	16	16	9.2	9.2	DC	527	4	23–27	10.0
25	413	587	46	62	11.1	10.6	LV	1,565	22	28–31	9.9
26	2,494	3,081	244	306	9.8	9.9	LA	2,244	24	32–38 [d]	10.0
27	2,208	5,289	225	531	10.2	10.0					
28	2,558	7,847	236	767	9.2	9.8					
29	3,385	11,232	356	1,123	10.5	10.0					
30	5,154	16,386	515	1,638	10.0	10.0					
31	4,756	21,142	480	2,118	10.1	10.0					
32	6,359	27,501	634	2,752	10.0	10.0					
33	6,344	33,845	599	3,351	9.4	9.9					
34	2,699	36,544	316	3,667	11.7	10.0					
35	3,067	39,611	304	3,971	9.9	10.0					
36	3,246	42,857	315	4,286	9.7	10.0					
37	559	43,416	95	4,381	17.0	10.1					
38	139	43,555	5	4,386	3.6	10.1					
Total		43,555	4,386		10.1						

-continued-

Table 9.–Page 2 of 3.

Stat Week	Weekly Weir Passage	Cum Weekly Weir passage	Weekly Sockeye Marked	Cum Weekly Sockeye Marked	Percent Weekly Marked	Percent Cum Marked	Total Marked by Stratum		Marking Mortality Observed at Weir	Stat Weeks	Percent Marked by Stratum
2001											
23	89	89	20	20	22.5	22.5					
24	265	354	30	50	11.3	14.1	DC	1,337	17	23-27	9.9
25	2,811	3,165	211	261	7.5	8.2	LV	3,075	64	28-31	7.6
26	4,171	7,336	447	708	10.7	9.7	LA	1,867	8	32-38 [d]	8.4
27	3,125	10,461	333	1,041	10.7	10.0					
28	3,083	13,544	313	1,354	10.2	10.0					
29	7,953	21,497	803	2,157	10.1	10.0					
30	11,168	32,665	952	3,109	8.5	9.5					
31	21,480	54,145	1,384	4,493	6.4	8.3					
32	11,231	65,376	801	5,294	7.1	8.1					
33	5,094	70,470	550	5,844	10.8	8.3					
34	2,320	72,790	278	6,122	12.0	8.4					
35	2,064	74,854	146	6,268	7.1	8.4					
36	1,182	76,036	100	6,368	8.5	8.4					
37	247	76,283	0	6,368	0	8.3					
38	0	76,283	0	6,368		8.3					
Total		76,283	6,368		8.3						
2002											
23	102	102	25	25	24.5	24.5					
24	2,005	2,107	187	212	9.3	10.1	DC	211	1	23-24	10.0
25	2,451	4,558	245	457	10.0	10.0	LV	582	3	25-26	10.3
26	3,195	7,753	340	797	10.6	10.3	RV	581	4	27-28	9.7
27	1,869	9,622	165	962	8.8	10.0	LA	1,273	8	29-30	7.7
28	4,138	13,760	420	1,382	10.1	10.0	RA	1,118	7	31-32	9.0
29	6,193	19,953	622	2,004	10.0	10.0	LP	785	2	33-34	10.1
30	10,433	30,386	659	2,663	6.3	8.8	RP	690		35-36	9.8
31	7,599	37,985	652	3,315	8.6	8.7	RLOP	153	1	37-38 [e]	19.0
32	4,775	42,760	473	3,788	9.9	8.9					
33	2,994	45,754	304	4,092	10.2	8.9					
34	4,764	50,518	483	4,575	10.1	9.1					
35	3,322	53,840	332	4,907	10.0	9.1					
36	3,716	57,556	358	5,265	9.6	9.1					
37	805	58,361	154	5,419	19.1	9.3					
38		58,361		5,419		9.3					
Total		58,361	5,419		9.3						

-continued-

Table 9.–Page 3 of 3.

Stat Week	Weekly Weir Passage	Cum Weekly Weir passage	Weekly Sockeye Marked	Cum Weekly Sockeye Marked	Percent Weekly Marked	Percent Cum Marked	Total Marked by Stratum		Marking Mortality Observed at Weir	Stat Weeks	Percent Marked by Stratum
					2003						
23	15	15	7	7	46.7	46.7					
24	342	357	29	36	8.5	10.1	AD	36			
25	448	805	45	81	10.0	10.1	RA	162		23-24	10.1
26	1,165	1,970	117	198	10.0	10.1	LA	682	5	25-26	10.0
27	2,805	4,775	280	478	10.0	10.0	RV	1,688	30	27-28	9.9
28	4,074	8,849	407	885	10.0	10.0	LV	2,487	5	29-30	9.1
29	7,207	16,056	718	1,603	10.0	10.0	DC	728	16	31-32	7.1
30	11,437	27,493	1,000	2,603	8.7	9.5	RP	451	17	33-34	10.5
31	21,041	48,534	1,201	3,804	5.7	7.8	LP	56		35-36	10.1
32	14,103	62,637	1,291	5,095	9.2	8.1				37-38 [f]	13.1
33	5,677	68,314	601	5,696	10.6	8.3					
34	1,251	69,565	143	5,839	11.4	8.4					
35	3,564	73,129	374	6,213	10.5	8.5					
36	902	74,031	94	6,307	10.4	8.5					
37	428	74,459	56	6,363	13.1	8.5					
38		74,459		6,363		8.5					
Total		74,459	6,363		8.5						

[a] AD = Adipose only clip, DC = Dorsal Clip, LA = Left Axillary Clip, LP = Left Pectoral Clip, LV = Left Ventral, RA = Right Axillary Clip, RP = Right Pectoral Clip, RV = Right Ventral Clip

[b] Total marked by stratum reduced due to marking mortality observed at the weir.

[c] Last day of sampling was September 13.

[d] Last day of sampling was September 12.

[e] Last day of sampling was September 11.

[f] Last day of sampling was September 9.

Table 10.–Recovery data collected from the 1999–2003 Chilkoot River mark–recapture program.

Date	Location Recovered	Capture Method	Total New Sockeye Captured	Stratum Marks Recovered	Total Daily Marks Recovered	% Marked
			1999			
7/24	Chilkoot Lake	Seine	104	11-DC[a]	11	10.6
7/29	Chilkoot Lake	Seine	20	3-DC, 1-LV	4	20.0
7/30	Chilkoot Lake	Seine	199	4-DC, 1-LV	5	2.5
8/06	Chilkoot Lake	Seine	159	9-DC, 6-LV	15	9.4
8/12	Chilkoot Lake	Seine	136	5-DC, 3-LV	8	5.9
8/19	Chilkoot Lake	Seine	53	2-LV	2	3.8
8/21	Chilkoot Lake	Seine	7	0	0	0.0
8/31	Chilkoot Lake	Seine	163	4-LV, 1-LA	5	3.1
9/03	Chilkoot Lake	Seine	65	2-DC, 3-LV, 1-LA	6	9.2
9/07	Chilkoot Lake	Seine	86	5-LV, 2-LA	7	8.1
9/16	Chilkoot Lake	Seine	97	1-LV, 1-LA	2	2.1
9/17	Bear Creek	Seine	28	1-LV	1	3.6
9/24	Chilkoot Lake	Seine	109	6-LV	6	5.5
9/30	Chilkoot Lake	Seine	87	1-LV, 3-LA	4	4.6
10/04	Chilkoot Lake	Carcass[b]	97	2-LV, 11-LA	13	13.4
Total			1,410	89	89	6.8
			2000			
7/15	Chilkoot Lake	Seine	148	12-DC, 4LV[a]	16	10.8
7/20	Chilkoot Lake	Seine	107	4-DC, 3-LV	7	6.5
7/25	Bear Creek	Seine	48	1-DC	1	2.1
7/27	Chilkoot Lake	Seine	110	1-DC, 3-LV	4	3.6
7/28	Chilkoot Lake	Seine	183	8-DC, 11-LV	19	10.4
8/04	Chilkoot Lake	Seine	149	12-DC, 7-LV	19	12.8
8/08	Bear Creek	Seine	100	1-DC, 4-LV	5	5.0
8/11	Chilkoot Lake	Seine	178	4-DC, 2-LV, 3-LA	9	5.1
8/15	Bear Creek	Seine	96	7-LV, 1-LA	8	8.3
8/17	Chilkoot Lake	Seine	123	6-DC, 1-LV, 1-LA	8	6.5
8/18	Bear Creek	Seine	39	2-LV	2	5.1
8/22	Chilkoot Lake	Seine	61	2-LV, 1-LA	3	4.9
8/28	Chilkoot Lake	Carcass[b]	25	1-DC, 2-LV, 1-LA	4	16.0
8/31	Chilkoot Lake	Seine	68	3-LA	3	4.4
9/07	Chilkoot Lake	Seine	85	3-LV, 2-LA	5	5.9
9/15	Chilkoot Lake	Carcass	84	2-LV, 5-LA	7	8.3
9/22	Chilkoot Lake	Seine	109	1-LV, 3-LA	4	3.7
9/28	Chilkoot Lake	Carcass	68	3-DC, 1-LV	4	5.9
Total			1,781	128	128	7.0

-continued-

Table 10.–Page 2 of 3.

Date	Location Recovered	Capture Method	Total New Sockeye Captured	Stratum Marks Recovered	Total Daily Marks Recovered	% Marked
			2001			
7/20	Chilkoot Lake	Seine	93	6-DC	6	6.5
7/21	Bear Creek	Seine	45	3-DC	3	6.7
7/27	Chilkoot Lake	Seine	77	5-DC	5	6.5
7/28	Bear Creek	Seine	109	8-DC	8	7.3
8/03	Chilkoot Lake	Seine	128	6-DC, 1-LV	7	5.5
8/05	Bear Creek	Seine	78	6-DC	6	7.7
8/10	Chilkoot Lake	Seine	64	5-DC, 1-LV	6	9.4
8/18	Chilkoot Lake	Seine	82	4-DC,1-LA	5	6.1
8/22	Chilkoot Lake	Seine	79	3-DC	3	3.8
8/24	Chilkoot Lake	Seine	107	3-DC, 6-LV, 1-LA	10	9.3
8/31	Chilkoot Lake	Seine	101	3-LV	3	3.0
9/06	Chilkoot Lake	Seine	70	4-LV	4	5.7
9/27	Chilkoot Lake	Seine	71	2-LV, 1-LA	3	4.2
10/2	Chilkoot Lake	Seine	119	8-LV, 3-LA	11	9.2
10/9	Chilkoot Lake	Carcass[b]	138	4-LV	4	2.9
Total			1,480	92	92	6.3
			2002			
7/11	Chilkoot Lake	Seine	102	2-DC, 3-LV[a]	5	4.9
7/16	Chilkoot Lake	Seine	87	2-DC, 4-LV, 1-RV	7	8.0
7/20	Chilkoot Lake	Seine	107	11-LV, 2-RV	13	12.1
7/25	Chilkoot Lake	Seine	126	3-DC, 6-LV, 4-RV	13	10.3
7/27	Chilkoot Lake	Seine	30	1-DC, 3-LV, 2-RV, 1-LA	7	23.3
8/02	Chilkoot Lake	Seine	91	1-DC, 2-LV, 2-RV, 1-LA	6	6.6
8/08	Chilkoot Lake	Seine	143	8-LV, 2-RV, 2-LA	12	8.4
8/15	Chilkoot Lake	Seine	169	5-LV, 7-RV, 1-LA, 1-RA	14	8.3
8/22	Chilkoot Lake	Seine	81	1-LV, 2-RV, 3-LA, 1-RA	7	8.6
8/29	Chilkoot Lake	Seine	99	2-LV, 2-RV, 2-LA, 2-LP	8	8.1
9/05	Chilkoot Lake	Seine	90	1-LV, 2-RV, 2-LA, 1-RA, 2-LP	8	8.9
9/12	Chilkoot Lake	Seine	104	2-RV, 1-LA, 1-RA, 2-LP, 1-RP	7	6.7
9/20	Chilkoot Lake	Seine	160	1-LV, 4-LA, 1-RA, 1-LP, 1-RP	8	5.0
9/27	Chilkoot Lake	Seine	217	2-RV, 4-LA, 7-RA, 1-LP, 2-RP	16	7.4
10/14	Chilkoot Lake	Seine	116	1-RV, 4-LA, 2-RA, 4-LP, 2-RP, 1-RLOP	14	12.1
10/18	Chilkoot Lake	Seine	165	5-LA, 3-RA, 7-LP, 4-RP, 2-RLOP	21	12.7
Total			1,887	166	166	9.5

-continued-

Table 10.–Page 3 of 3.

Date	Location Recovered	Capture Method	Total New Sockeye Captured	Stratum Marks Recovered	Total Daily Marks Recovered	% Marked
				2003		
7/21	Chilkoot Lake	Seine	76	6-AD[a]	6	7.9
8/07	Chilkoot Lake	Seine	95	2-AD, 2-LA, 1-RV	5	5.3
8/14	Bear Creek	Seine	184	1-RA, 3-LA, 1-RV	5	2.7
8/21	Chilkoot Lake	Seine	109	2-RA, 2-LA, 1-RV	5	4.6
8/28	Chilkoot Lake	Seine	131	1-LA, 6-RV, 1-LV	8	6.1
9/05	Chilkoot Lake	Seine	131	1-LA	1	0.8
9/12	Chilkoot Lake	Seine	229	1-LA, 6-RV, 2-LV, 1-DS	10	4.4
9/19	Chilkoot Lake	Seine	114	4-RV, 3-LV, 1-LP	8	7.0
9/26	Chilkoot Lake	Seine	200	3-RV, 5-LV, 2-DS	10	5.0
10/10	Chilkoot Lake	Seine	127	0	0	0.0
10/04	Chilkoot Lake	Seine	133	2-LV	2	1.5
Total			1,529	60	60	4.4

[a] DC=Dorsal Clip, LV=Left Ventral Clip, RV=Right Ventral Clip, LA=Left Axillary Clip, RA= Right Axillary Clip, LP=Left Pectoral Clip, RP=Right Pectoral Clip, RLOP=Right Lower Operculum Punch

[b] Carcass examinations from spawned out fish.

Table 11.–Marking and recovery summary by statistical week, 1999–2003 Chilkoot Lake sockeye salmon mark–recapture program.

Statistical Week of Marking	Mark Applied[a]	Statistical Week of Recovery															Total Marks Recovered[b]	Marks Applied[c]	Percent Recovered
		28	29	30	31	32	33	34	35	36	37	38	39	40	41	42			
1999																			
23–27	DC	-	-	11	7	9	5	0	0	2	0	0	0	0	0	-	34	548	6.20%
28–31	LV	-	-	0	2	6	3	2	0	7	5	2	6	1	2	-	36	1,270	2.83%
32–38	LA	-	-	0	0	0	0	0	0	2	2	1	0	3	11	-	19	2,118	0.90%
Total		-	-	11	9	15	8	2	0	11	7	3	6	4	13	-	89	3,952	
Examined		0	0	104	219	159	136	60	0	228	86	125	109	87	97	0	1,410		
2000																			
24–27	DC	-	12	4	10	12	5	6	0	1	0	0	0	3	-	-	53	527	10.06%
28–31	LV	-	4	3	14	7	6	10	2	2	3	2	1	1	-	-	55	1,565	3.51%
32–38	LA	-	0	0	0	0	3	2	1	4	2	5	3	0	-	-	20	2,244	0.89%
Total		-	16	7	24	19	14	18	3	7	5	7	4	4	-	-	128	4,336	
Examined		0	148	107	341	149	278	258	61	93	85	84	109	68	0	0	1,781		
2001																			
23–28	DC	-	17	13	6	11	4	6	0	0	0	0	0	0	0	-	57	1,337	4.26%
29–31	LV	-	0	0	1	1	0	6	3	4	0	0	2	8	4	-	29	3,075	0.94%
32–37	LA	-	0	0	0	0	1	1	0	0	0	0	1	3	0	-	6	1,867	0.32%
Total		-	17	13	7	12	5	13	3	4	0	0	3	11	4	-	92	6,279	
Examined		0	257	186	128	142	82	186	101	70	0	0	71	119	138	0	1,480		

-continued-

Table 11.–Page 2 of 2.

Statistical Week of Marking	Mark Applied[a]	Statistical Week of Recovery															Total Marks Recovered[b]	Marks Applied[c]	Percent Recovered
		28	29	30	31	32	33	34	35	36	37	38	39	40	41	42			
2002																			
Start–24	DC	2	2	4	1	0	0	0	0	0	0	0	0	-	-	0	9	211	4.27%
25–26	LV	3	15	9	2	8	5	1	2	1	0	1	0	-	-	0	47	582	8.08%
27–28	RV	0	3	6	2	2	7	2	2	2	2	0	2	-	-	1	31	581	5.34%
29–30	LA	0	0	1	1	2	1	3	2	2	1	4	4	-	-	9	30	1,273	2.36%
31–32	RA	0	0	0	0	0	1	1	0	1	1	1	7	-	-	5	17	1,118	1.52%
33–34	LP	0	0	0	0	0	0	0	2	2	2	1	1	-	-	11	19	785	2.42%
35–36	RP	0	0	0	0	0	0	0	0	0	1	1	2	-	-	6	10	690	1.45%
37–38	RLOP	0	0	0	0	0	0	0	0	0	0	0	0	-	-	3	3	153	1.96%
Total		5	20	20	6	12	14	7	8	8	7	8	16	-	-	35	166	5,393	
Examined		102	194	156	91	143	169	81	99	90	104	160	217	0	0	281	1,887		
2003																			
Start–24	AD	-	-	6	-	2	0	0	0	0	0	0	0	0	0	-	8	36	22.22%
25–26	RA	-	-	0	-	0	1	2	0	0	0	0	0	0	0	-	3	162	1.85%
27–28	LA	-	-	0	-	2	3	2	1	1	1	0	0	0	0	-	10	682	1.47%
29–30	RV	-	-	0	-	1	1	1	6	0	6	4	3	0	0	-	22	1,688	1.30%
31–32	LV	-	-	0	-	0	0	0	1	0	2	3	5	0	2	-	13	2,487	0.52%
33–34	DC	-	-	0	-	0	0	0	0	0	1	0	2	0	0	-	3	728	0.41%
35–36	RP	-	-	0	-	0	0	0	0	0	0	0	0	0	0	-	0	451	0.00%
37–38	LP	-	-	0	-	0	0	0	0	0	0	1	0	0	0	-	1	56	1.79%
Total		-	-	6	-	5	5	5	8	1	10	8	10	0	2	-	60	6,290	
Examined		0	0	76	0	95	184	109	131	131	229	114	200	127	133	0	1,529		

[a] Each fish was marked with an adipose fin clip and other fin clips according to timing strata. DC=Dorsal Clip, LV=Left Ventral Clip, RV=Right Ventral Clip, LA=Left Axillary Clip, RA= Right Axillary Clip, LP=Left Pectoral Clip, RP=Right Pectoral Clip, RLOP=Right Lower Operculum Punch, AD=Adipose only Clip.

[b] Number of fish examined reduced by removal of jack salmon from the analysis.

[c] Number of marks out reduced by the removal of jacks from the analysis.

Table 12.–Pooled marking and recovery data used to calculate estimates of Chilkoot sockeye salmon escapements to Chilkoot Lake, 1999–2003.

1999

Statistical Week of Marking	Dates of Recovery: July 24, 29, 30	August 6, 12, 19, 21, 31	September 3, 7, 16, 17, 24	Sept/Oct 31,4	Total Marks Recovered[a]	Marks Applied[b]
23–27	18	14	2	0	34	548
28–31	2	15	16	3	36	1,270
32–38	0	1	4	14	19	2,118
Total	20	30	22	0	89	3,952
Examined	323	511	385	184	1,403	

2000

Statistical Week of	Dates of Recovery: July					August						Aug/Sept.	September		October	Total Marks	Marks
Marking	15	20	25	27	28	4	8	11, 15	17	18	22, 28	31, 7	15,22	28		Recovered[a]	Applied[b]
23–31	16	7	1	4	19	19	5	13	7	2	5	3	3	4	0	108	2,092
31–38	0	0	0	0	0	0	0	4	1	0	2	5	8	0	0	20	2,244
Total	16	7	1	4	19	19	5	17	8	2	7	8	11	4	0	128	4,336
Examined	148	107	48	110	183	149	100	274	123	39	86	153	193	68	0	1,781	

2001

Statistical Week of	Dates of Recovery: July					August							September		October		Total Marks	Marks
Marking	15	20	21	27	28	3	5	10	18	22	24	31	6	27	2	9	Recovered[a]	Applied[b]
23–27	8	6	3	5	8	6	6	5	4	3	3	0	0	0	0	0	57	1,337
28–38	0	0	0	0	0	1	0	1	1	0	7	3	4	3	11	4	35	4,942
Total	8	6	3	5	8	7	6	6	5	3	10	3	4	3	11	4	92	6,279
Examined	119	93	45	77	109	128	78	64	82	79	107	101	70	71	119	138	1,480	

-continued-

Table 12.–Page 2 of 2.

2002

Statistical Week of	Dates of Recovery															Total Marks	Marks
	July				Jul/Aug	August				September				October			
Marking	11	16	20	25	27,2	8	15	29	29	5	12	20	27	14	18	Recovered[a]	Applied[b]
23–24	2	2	0	3	2	0	0	0	0	0	0	0	0	0	0	9	211
25–26	3	4	11	6	5	8	5	2	2	1	0	1	0	0	0	48	582
27–28	0	1	2	4	4	2	7	2	2	2	2	0	2	1	0	31	581
29–30	0	0	0	0	2	2	1	2	2	2	1	4	4	4	5	29	1,273
31–32	0	0	0	0	0	0	1	0	0	1	1	1	7	2	3	16	1,118
33–38	0	0	0	0	0	0	0	2	2	2	3	2	3	7	13	34	1,628
Total	5	7	13	13	13	12	14	8	8	8	7	8	16	14	21	167	5,393
Examined	102	87	107	126	121	143	169	99	99	90	104	160	217	116	165	1,905	

2003

Statistical Week of	Dates of Recovery										Total Marks	Marks
	July	August				September				October		
Marking	21	7	14	21	28	5	12	19	26	3,10	Recovered[a]	Applied[b]
23–26	6	2	1	2	0	0	0	0	0	0	11	198
27–28	0	2	3	2	1	1	1	0	0	0	10	682
29–30	0	1	1	1	6	0	6	4	3	0	22	1,688
31–38	0	0	0	0	1	0	3	4	7	2	17	3,722
Total	6	5	5	5	8	1	10	8	10	0	60	6,290
Examined	76	95	184	109	131	131	229	114	200	260	1,529	

[a] Number of fish examined reduced by removal of jack salmon from the analysis.

[b] Number of marks out reduced by the removal of jacks from the analysis.

Table 13.–Historical age composition of the Chilkoot Lake sockeye salmon escapement, 1982–2003.

		Percent By Age Class											
Year	**Sample Size**	**0.1**	**0.3**	**1.1**	**1.2**	**1.3**	**1.4**	**2.1**	**2.2**	**2.3**	**2.4**	**3.2**	**3.3**
1982	1,687	0.1	0.1	0.0	19.0	78.4	0.9	0.1	0.5	0.9	0.0	0.0	0.0
1983	1,790	0.0	0.1	0.1	12.0	60.4	0.2	0.1	1.4	25.8	0.0	0.0	0.0
1984	1,902	0.0	0.0	0.0	4.5	86.7	0.8	0.0	0.4	7.6	0.0	0.0	0.0
1985	1,623	0.0	0.0	0.1	12.2	66.4	2.4	0.0	2.6	15.9	0.3	0.1	0.0
1986	2,147	0.0	0.0	0.0	13.2	67.0	0.6	0.0	2.2	16.8	0.1	0.0	0.0
1987	2,207	0.0	0.0	0.0	8.4	69.2	0.2	0.0	2.2	19.8	0.1	0.0	0.0
1988	2,661	0.0	0.0	0.0	4.4	77.9	1.4	0.0	2.7	13.2	0.3	0.0	0.0
1989	2,586	0.0	0.0	0.0	4.5	54.9	1.2	0.0	5.0	33.5	0.4	0.0	0.5
1990	2,815	0.0	0.0	0.0	2.0	45.4	0.1	0.0	1.5	49.1	0.1	0.0	0.1
1991	2,297	0.0	0.0	0.0	12.5	55.9	0.4	0.0	4.9	25.9	0.3	0.0	0.1
1992	2,039	0.0	0.0	0.0	1.8	62.6	0.7	0.0	5.8	28.3	0.5	0.1	0.1
1993	2,075	0.0	0.0	0.0	2.6	35.6	0.3	0.0	1.8	59.0	0.4	0.0	0.2
1994	1,986	0.0	0.1	0.0	1.8	66.9	0.6	0.0	1.6	28.8	0.2	0.1	0.1
1995	606	0.0	0.0	0.0	44.1	30.7	0.8	0.0	3.8	20.0	0.7	0.0	0.0
1996	2,063	0.0	0.0	0.0	6.2	84.2	0.2	0.0	0.8	8.5	0.0	0.0	0.0
1997	2,111	0.0	0.0	0.0	2.2	90.1	0.1	0.0	0.4	7.1	0.0	0.0	0.0
1998	941	0.1	0.0	0.0	5.0	60.6	1.4	0.0	2.1	30.6	0.1	0.0	0.1
1999	2,033	0.0	0.0	0.0	28.8	46.5	0.2	0.0	8.1	16.3	0.2	0.0	0.0
2000	2,228	0.0	0.0	0.0	13.2	58.6	0.1	0.0	1.9	26.1	0.0	0.0	0.0
2001	2,345	0.0	0.3	0.0	4.8	89.8	0.0	0.0	0.2	4.9	0.0	0.0	0.0
2002	2,836	0.0	0.0	0.0	6.4	89.6	0.5	0.0	1.1	2.5	0.0	0.0	0.0
2003	2,611	0.0	0.0	0.0	41.3	45.0	0.4	0.0	4.2	9.1	0.0	0.0	0.0
Average (1982–2003)	2,072	0.0	0.0	0.0	10.4	65.7	0.6	0.0	2.5	20.4	0.2	0.0	0.1

Table 14.–Average length (mid-eye to fork in mm) by age category for Chilkoot Lake sockeye salmon, 1982–2003.

Age	Sample Size	Length By Age Class in MEF												
		0.3	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	3.1	3.2	3.3	Average
1982	1,684	620	-	466	577	621	-	489	584	-	-	-	-	556
1983	1,790	572	377	455	573	595	420	474	567	-	-	-	-	556
1984	1,901	-	-	461	571	600	-	470	570	-	-	-	-	566
1985	1,623	-	320	471	569	604	-	476	565	608	-	470	-	555
1986	2,146	-	410	472	582	611	-	485	581	618	-	-	565	565
1987	2,207	-	-	468	583	593	-	472	582	596	-	-	560	571
1988	2,658	-	-	496	578	604	-	499	575	590	-	-	565	572
1989	2,584	-	-	468	580	604	-	480	576	592	-	-	569	569
1990	2,815	-	-	467	579	607	-	497	577	596	-	490	580	575
1991	2,293	-	-	481	565	616	-	477	565	583	-	-	550	551
1992	2,038	575	-	471	570	596	-	470	571	595	-	508	565	563
1993	2,073	-	-	487	575	583	-	506	573	565	550	-	550	570
1994	1,985	540	-	471	568	596	-	489	569	582	-	450	610	565
1995	605	-	-	496	571	594	-	506	573	608	-	-	-	536
1996	2,042	635	-	509	589	611	-	514	585	-	-	490	-	583
1997	2,107	565	-	508	577	577	-	508	569	-	-	-	575	575
1998	936	-	-	492	572	574	-	514	570	605	-	-	595	566
1999	2,030	-	-	491	578	579	-	512	574	605	-	-	-	547
2000	2,211	-	-	508	582	582	-	505	583	425	-	-	-	571
2001	2,344	562	-	494	581	560	-	527	574	-	-	-	-	577
2002	2,834	-	-	479	584	615	-	482	579	-	-	-	-	576
2003	2,605	-	-	494	577	590	-	496	578	574	-	-	-	540
Average (1982–2003)	1,970	573	371	485	578	602	420	490	574	591	550	489	566	565

Table 15.–Chilkoot Lake mark–recapture point estimates with 95% confidence intervals, compared to Chilkoot weir count, 1996–2003.

Year	Mark–Recapture Point Estimate	Standard Error	95% normal CI	Chilkoot Weir Count
1996[a]	65,000	9,000	46,000–83,000	50,739
1997[a]	79,000	5,000	68,000–89,000	44,254
1998[b]	28,000	5,000	18,000–38,000	12,335
1999	62,000	6,000	50,000–74,000	19,284
2000	60,000	5,000	50,000–70,000	43,555
2001	100,000	10,000	81,000–119,000	76,283
2002	61,000	4,000	52,000–70,000	58,361
2003	177,000	39,000	99,000–254,000	74,459

Note: CI = confidence interval

[a] Beesley, ADF&G, unpublished data

[b] Kelley and Bachman 1999

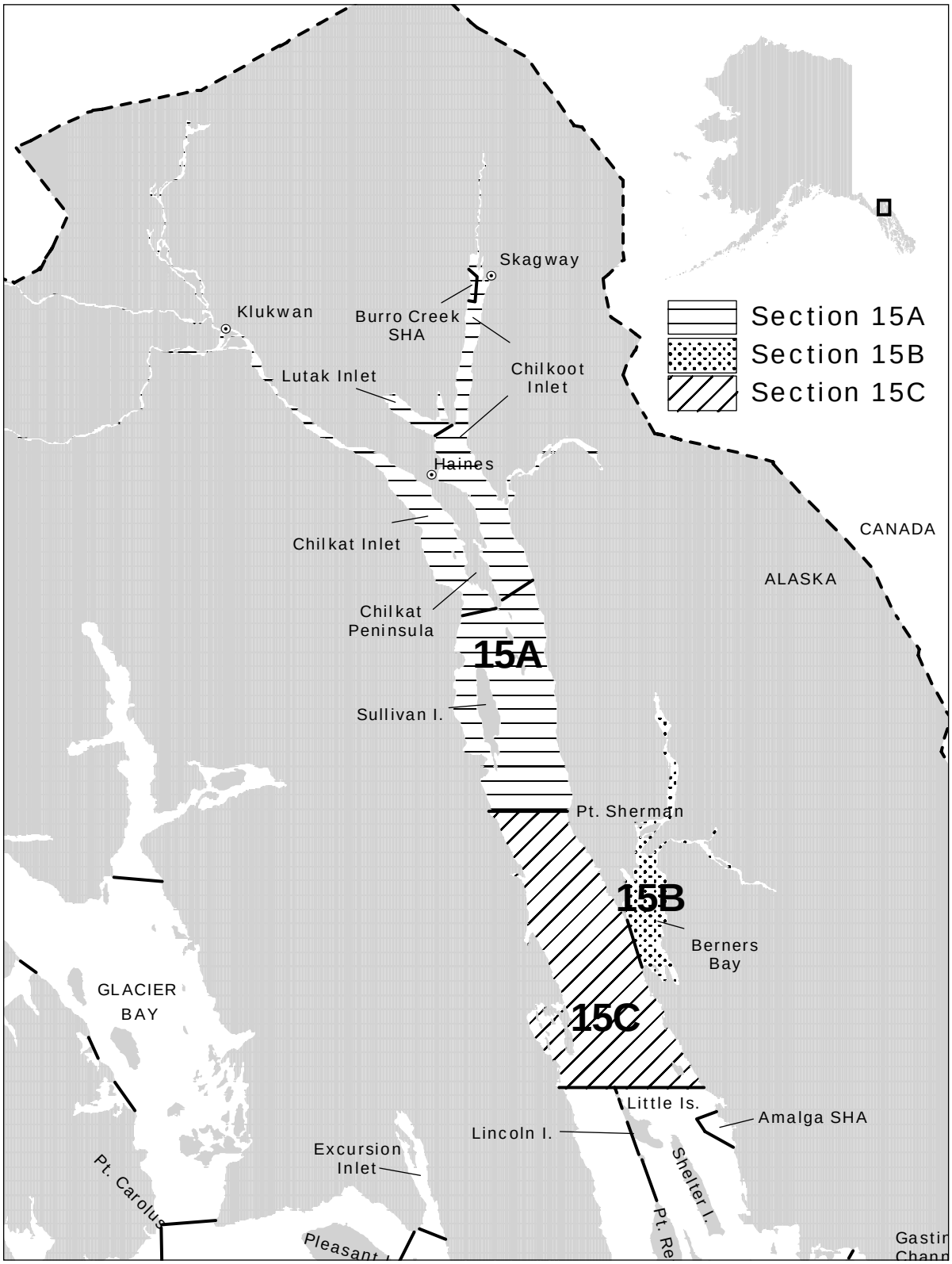


Figure 1.–District 115, Lynn Canal, district and section boundaries.

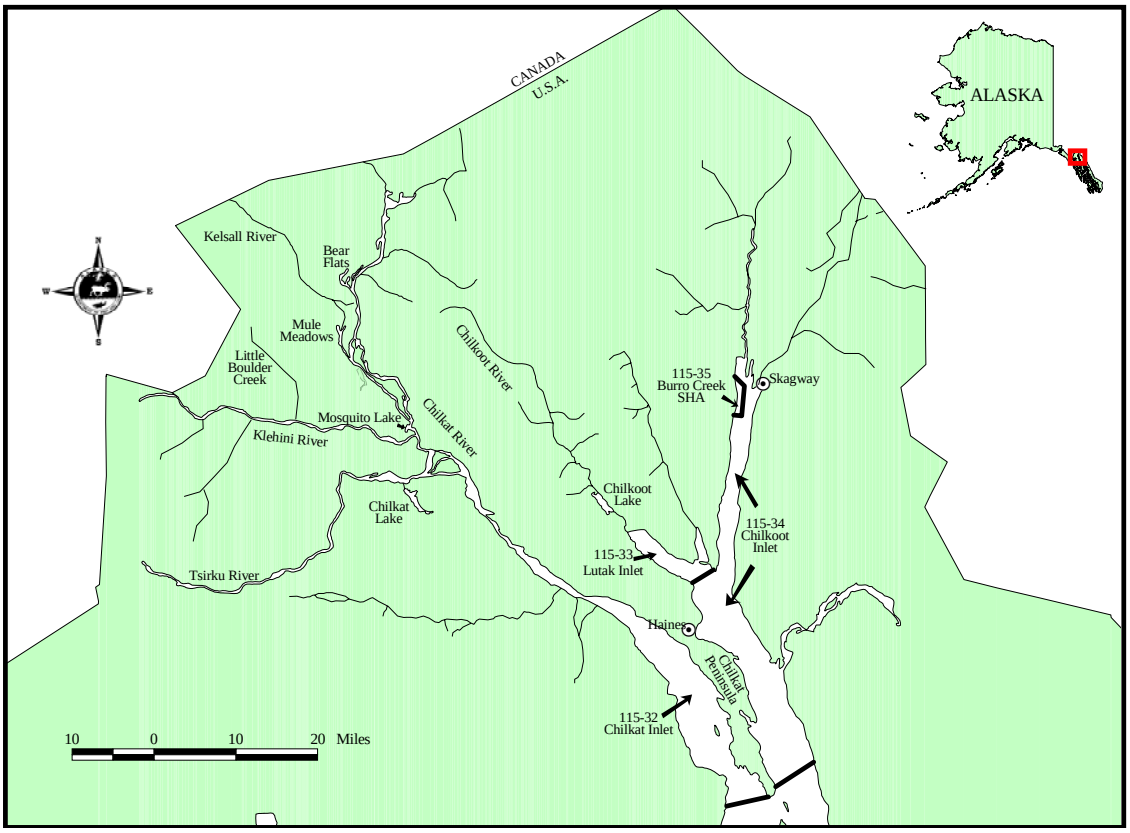


Figure 2.–Upper Lynn Canal with adjacent sockeye salmon spawning tributaries.

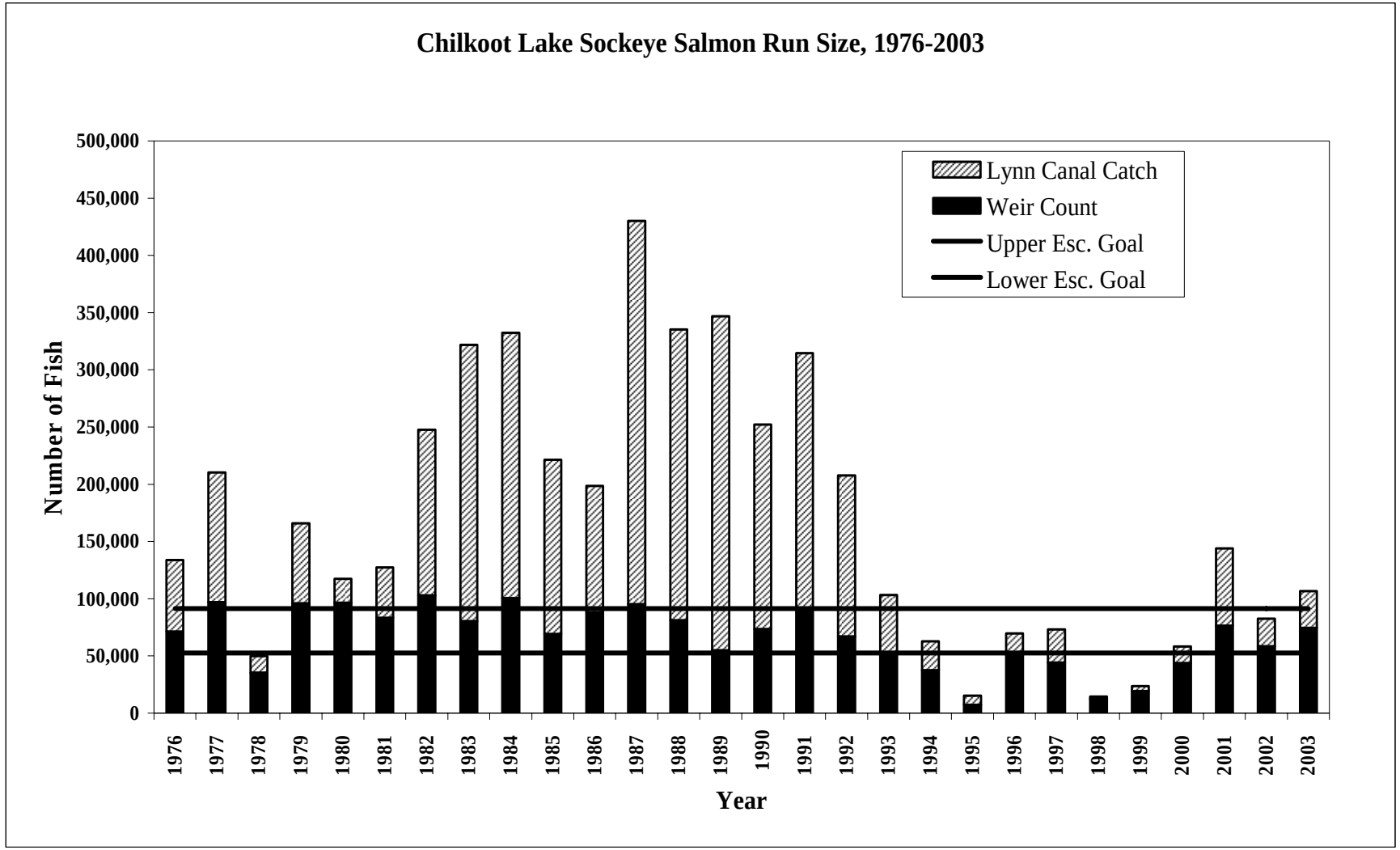
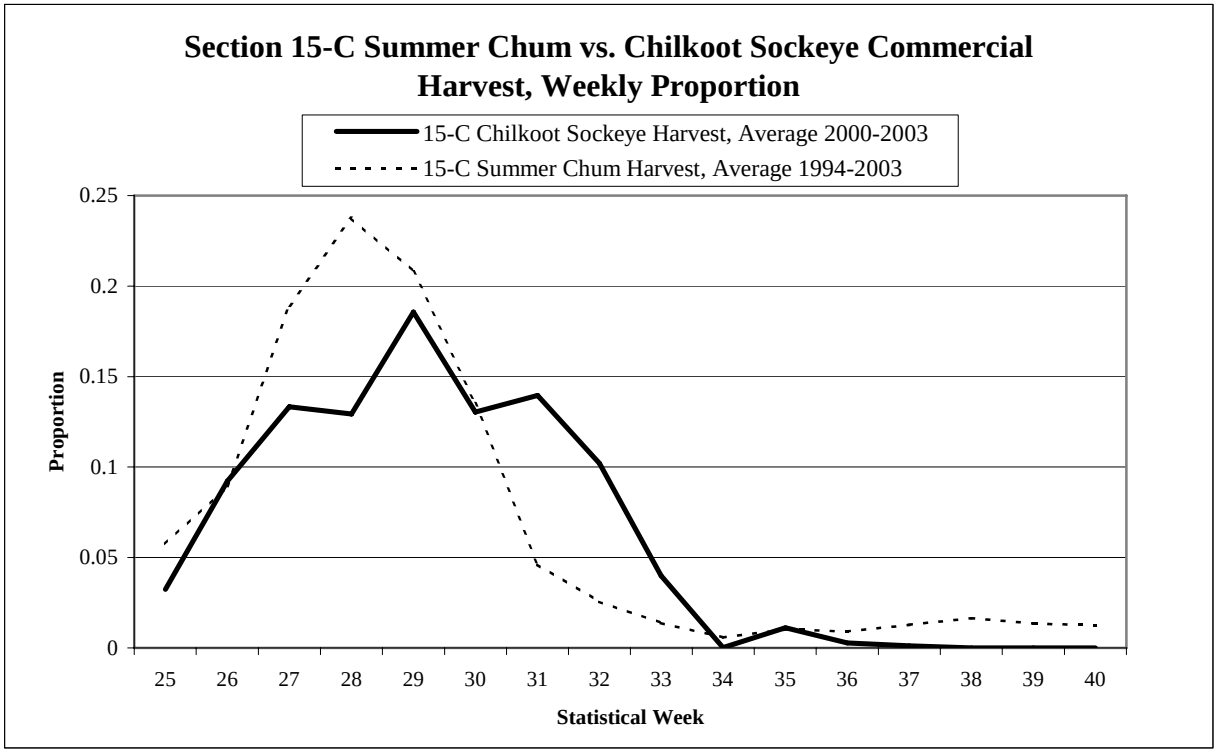
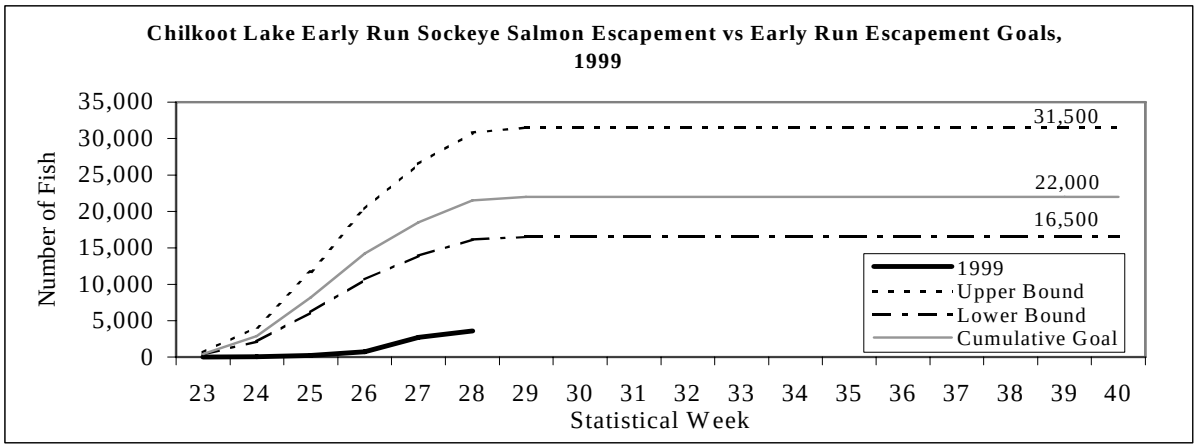


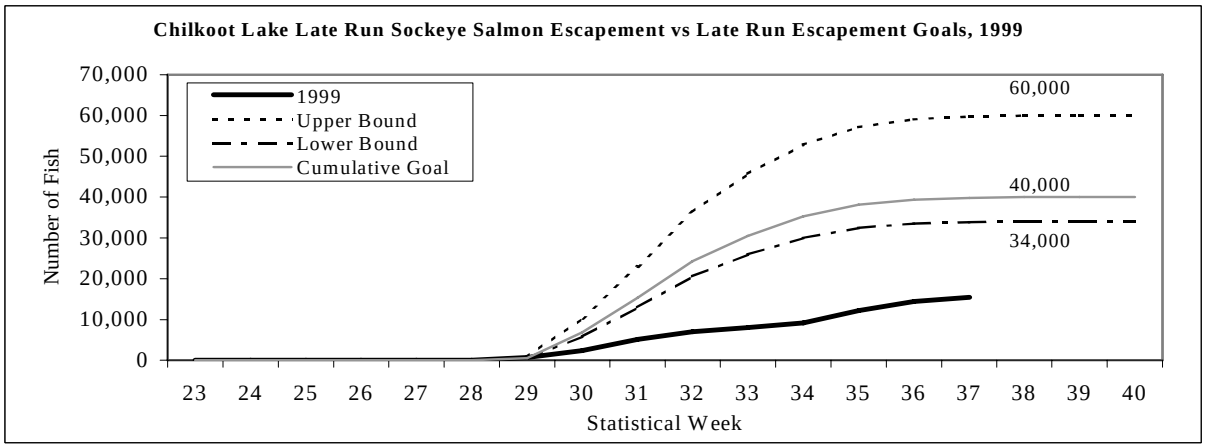
Figure 3.–Historical yearly weir count and commercial harvest of Chilkoot River sockeye salmon, 1976–2003, compared to upper and lower biological escapement goals.



Note: The 15-C harvest does not include fish caught in the Boat Harbor (115-11) area.

Figure 4.–Weekly proportion of summer chum commercial harvest (1994–2003 average) versus weekly proportion of Chilkoot Lake sockeye commercial harvest (2000–2003 average), in Lynn Canal, Section 15-C.





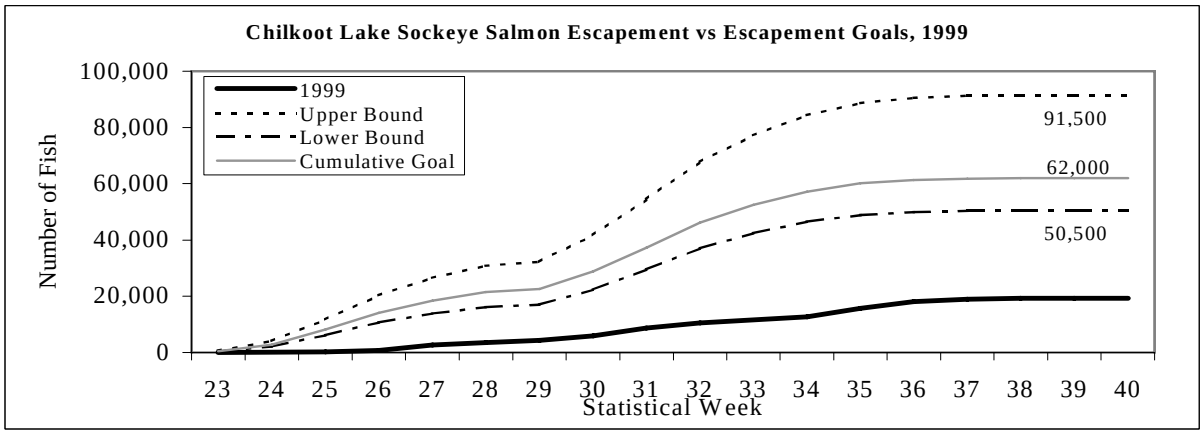
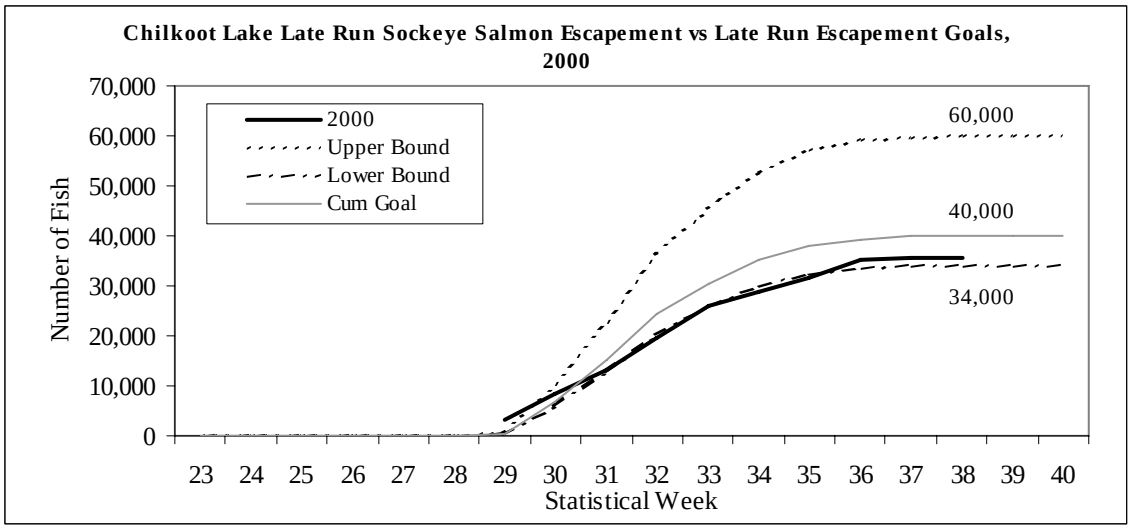


Figure 5.–Cumulative weir counts for Chilkoot Lake sockeye salmon by stock compared to cumulative escapement goals, 1999–2003. Upper and lower bounds for the escapement goal are designed to achieve escapements that will produce sustained harvests within 10–15% of the goal (McPherson 1990).

-continued-



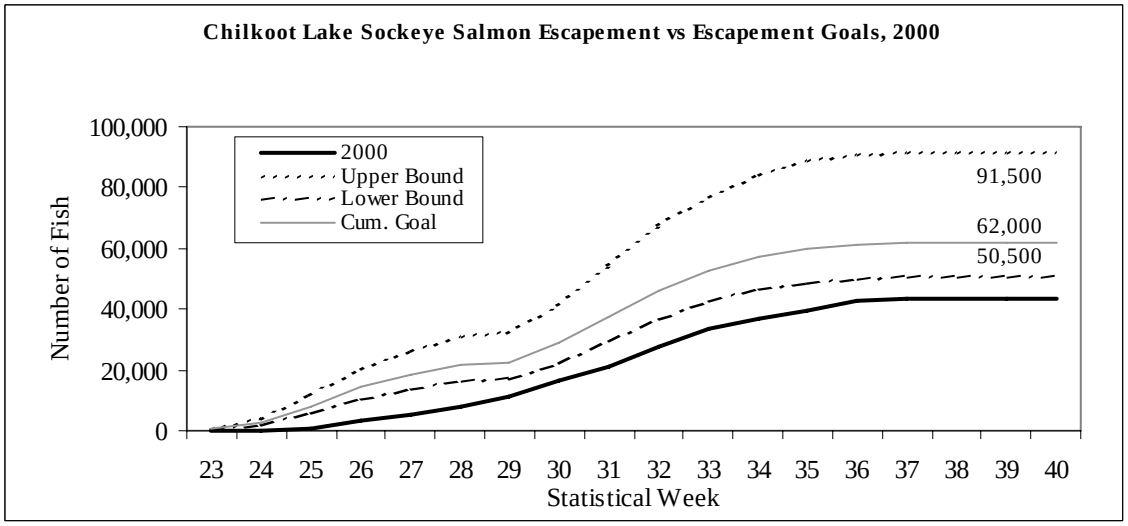
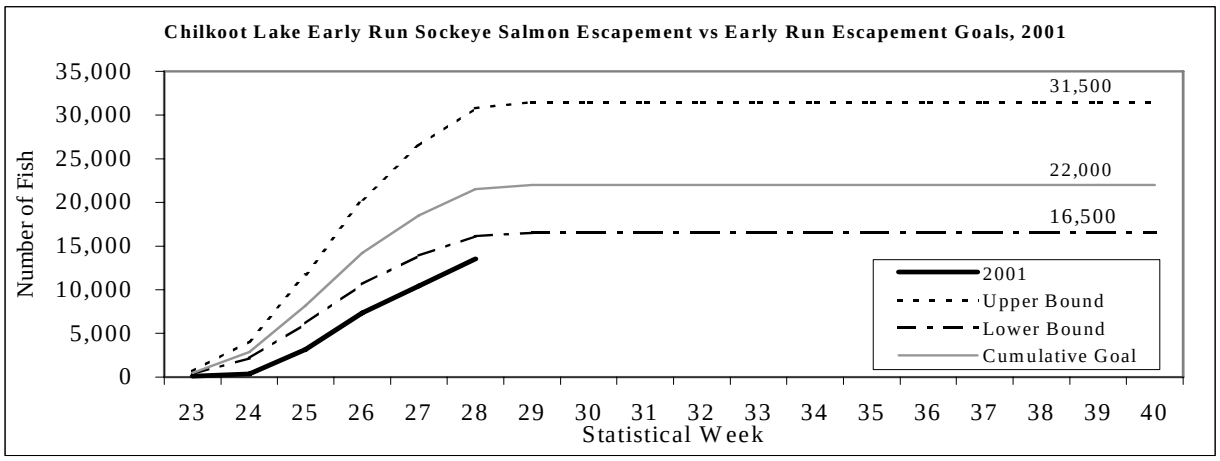
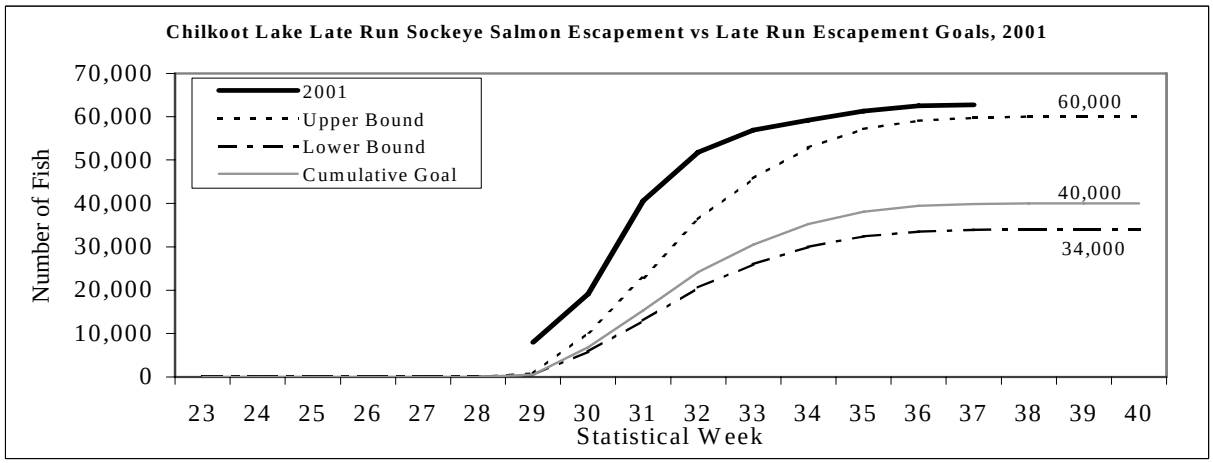


Figure 5.–Page 2 of 5.

-continued-





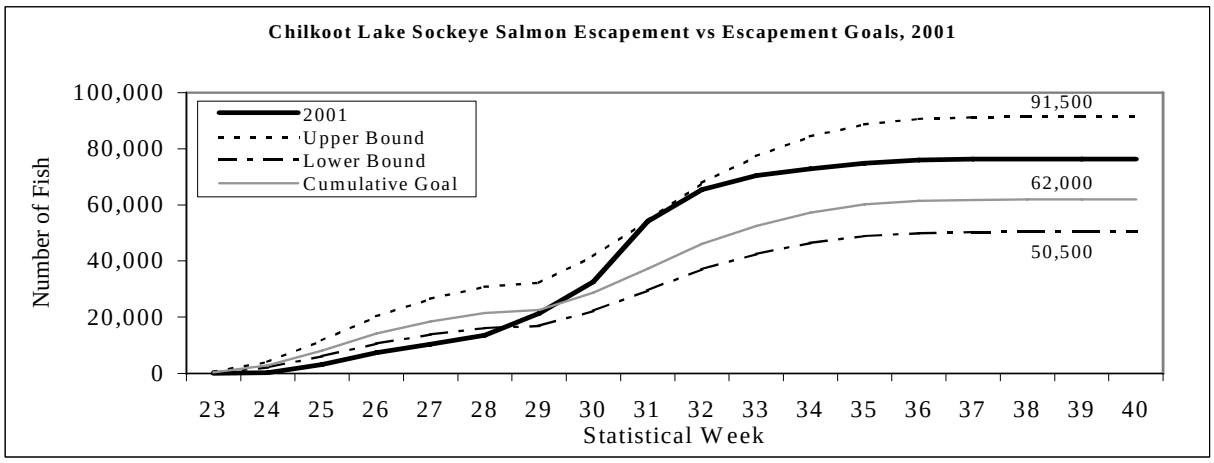
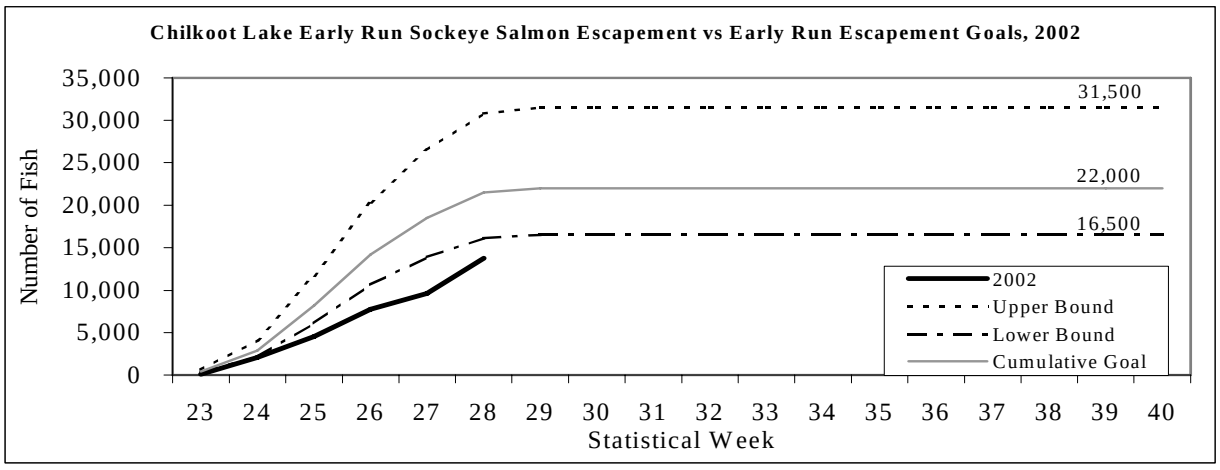
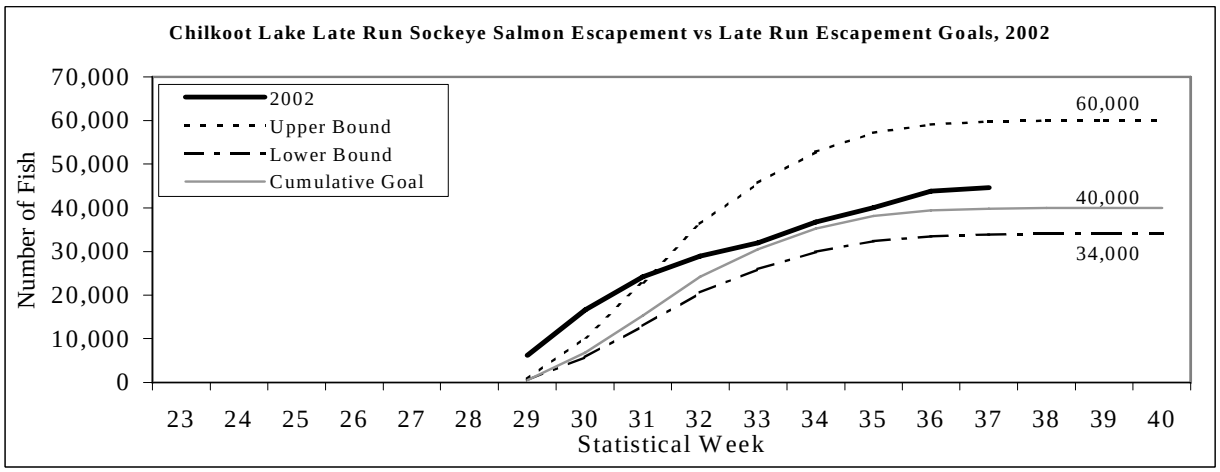


Figure 5.–Page 3 of 5.

-continued-





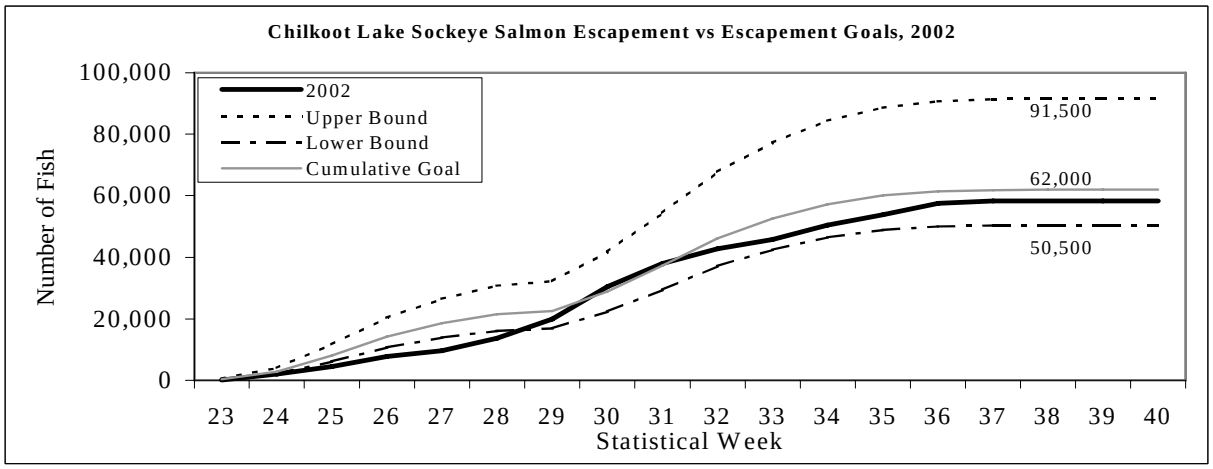
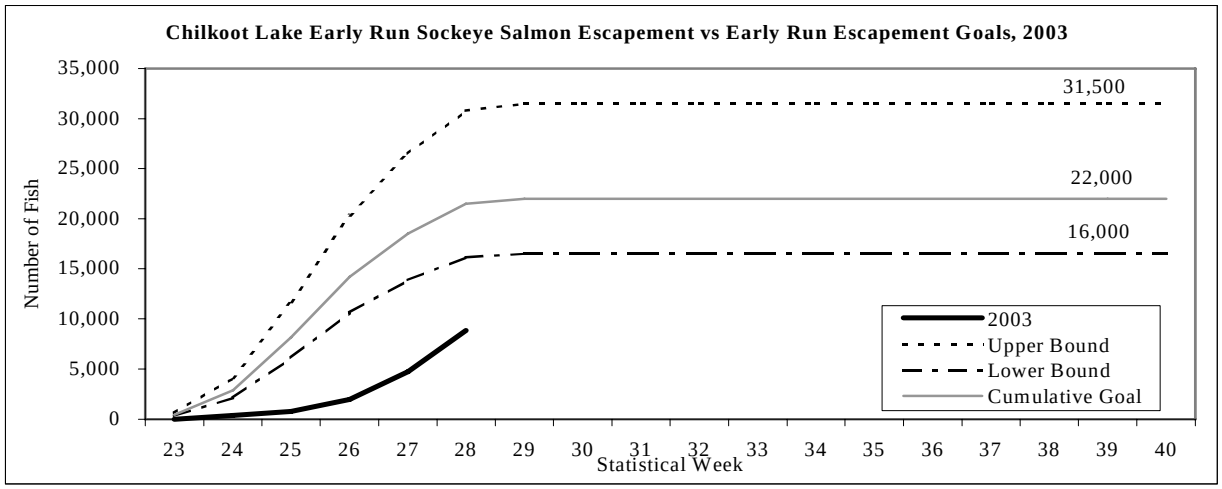
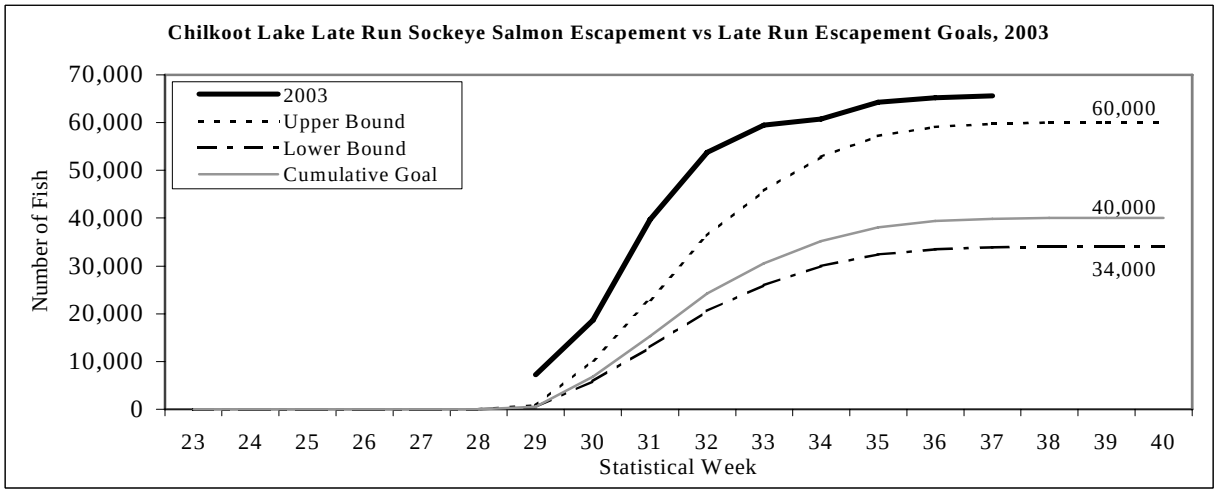


Figure 5.–Page 4 of 5.

-continued-





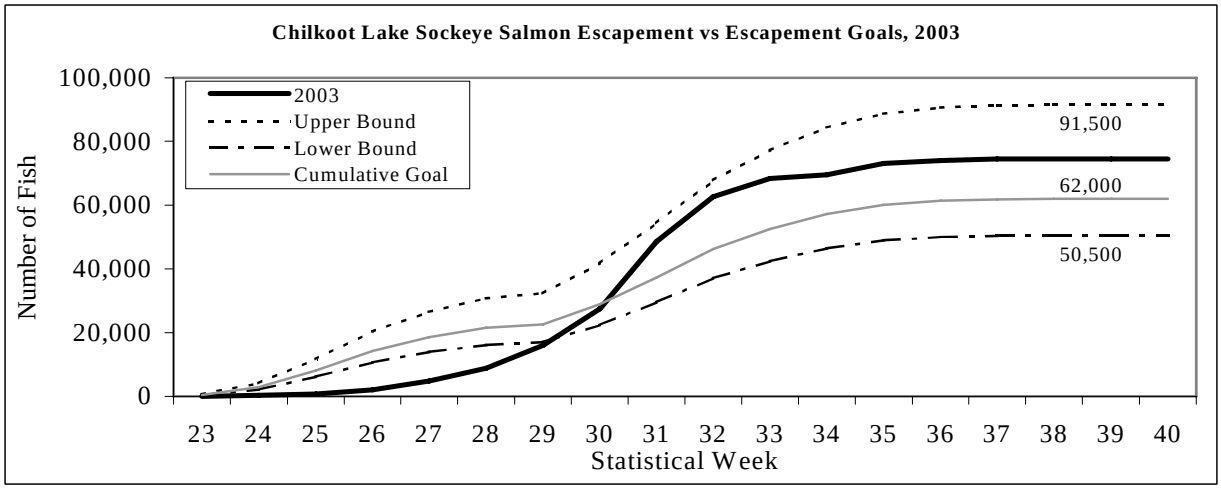


Figure 5.–Page 5 of 5.

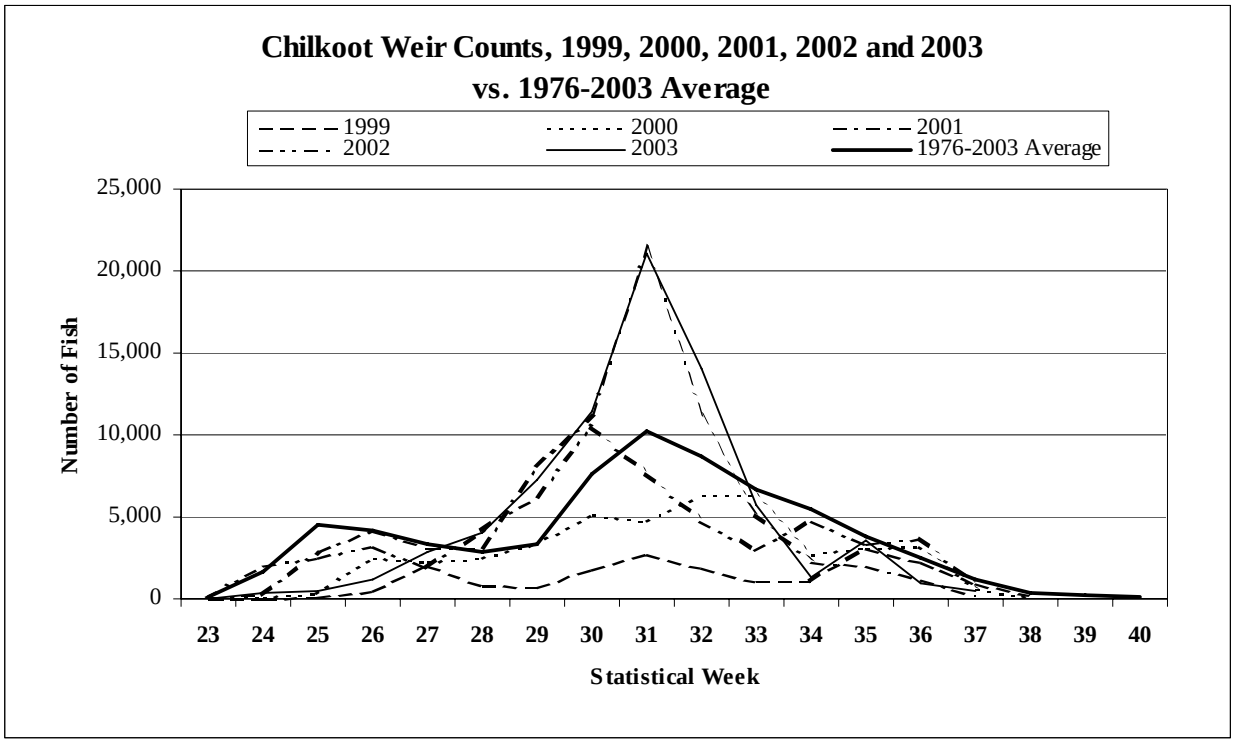
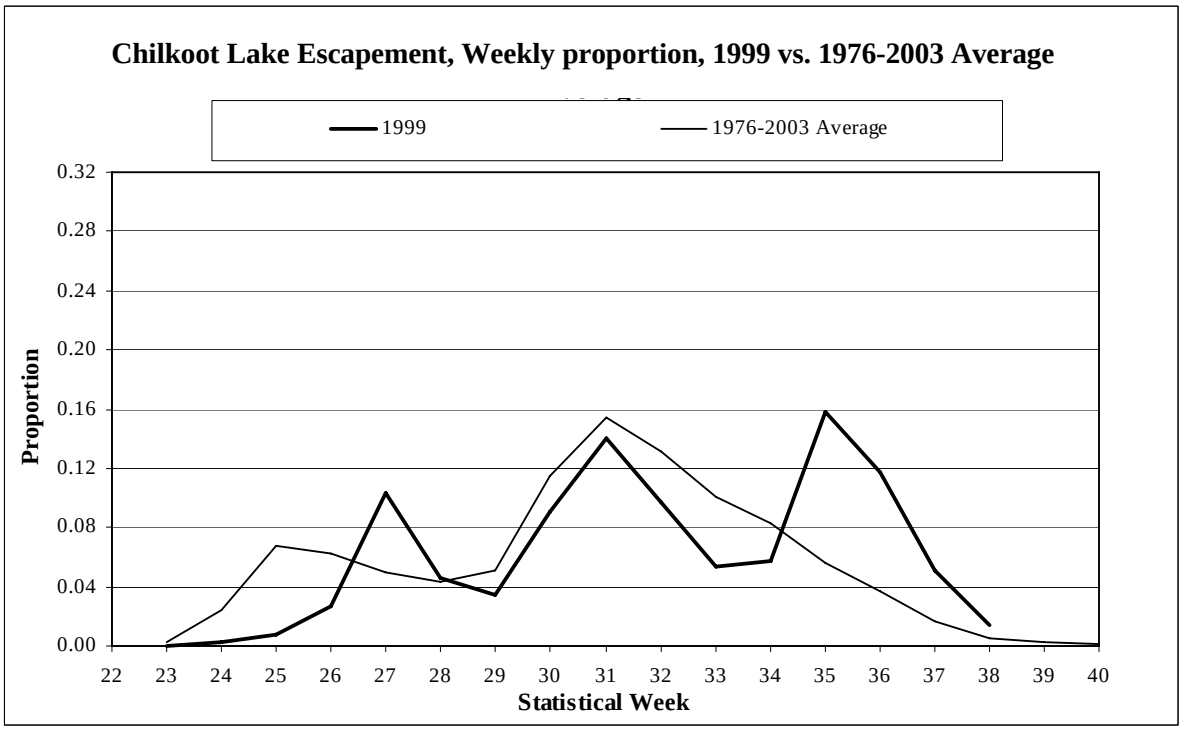


Figure 6.–Weekly 1999, 2000, 2001, 2002 and 2003 Chilkoot River sockeye salmon weir counts versus 1976–2003 averages.



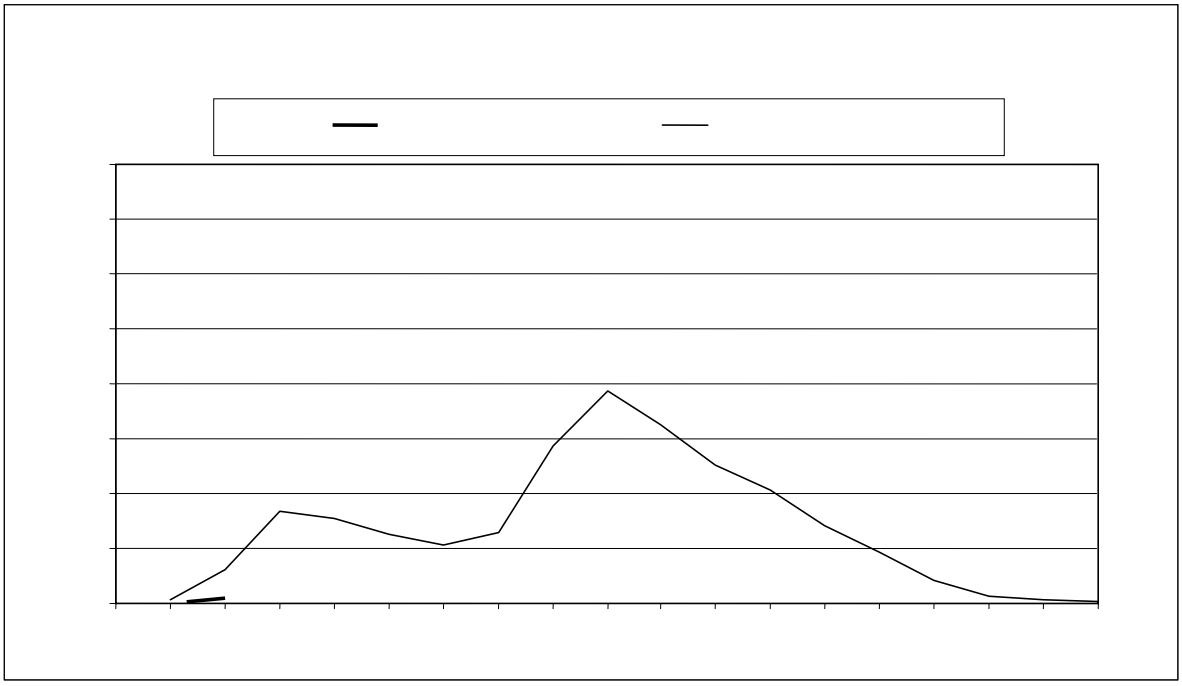
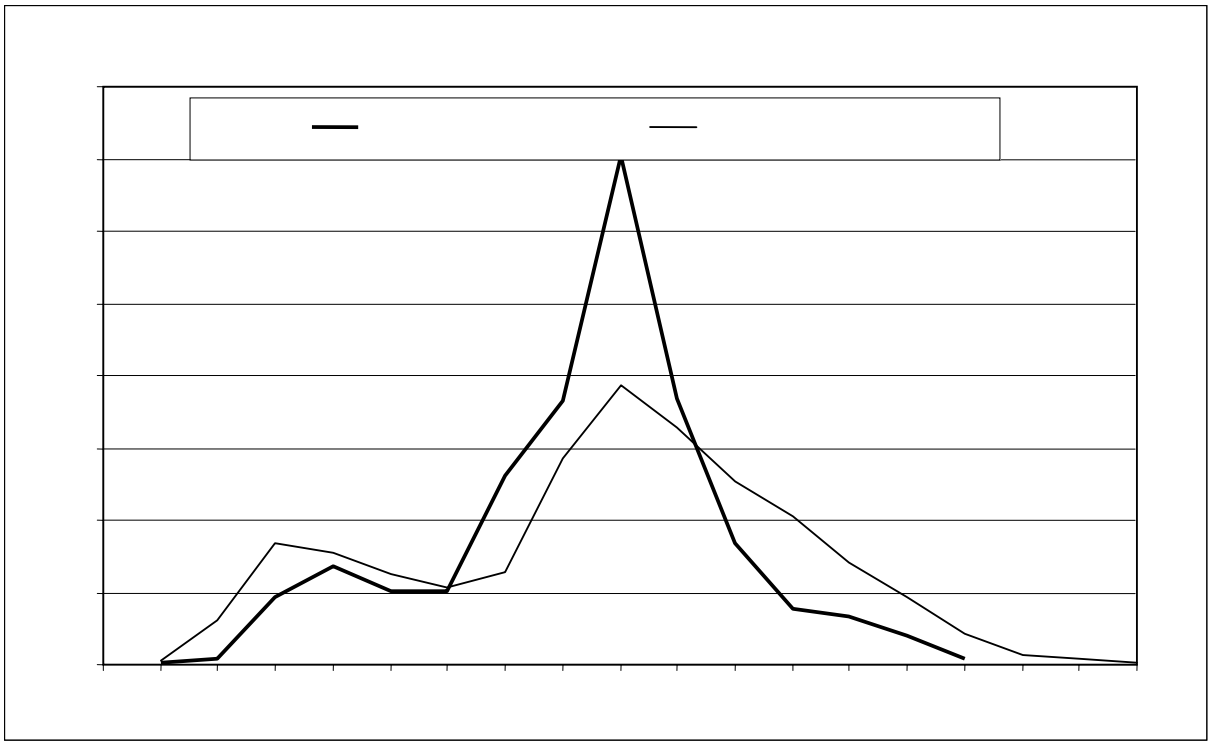


Figure 7.–Weekly proportion of Chilkoot Lake sockeye salmon through the Chilkoot River weir, 1999, 2000, 2001, 2002 and 2003 vs. the 1976–2003 average.

-continued-



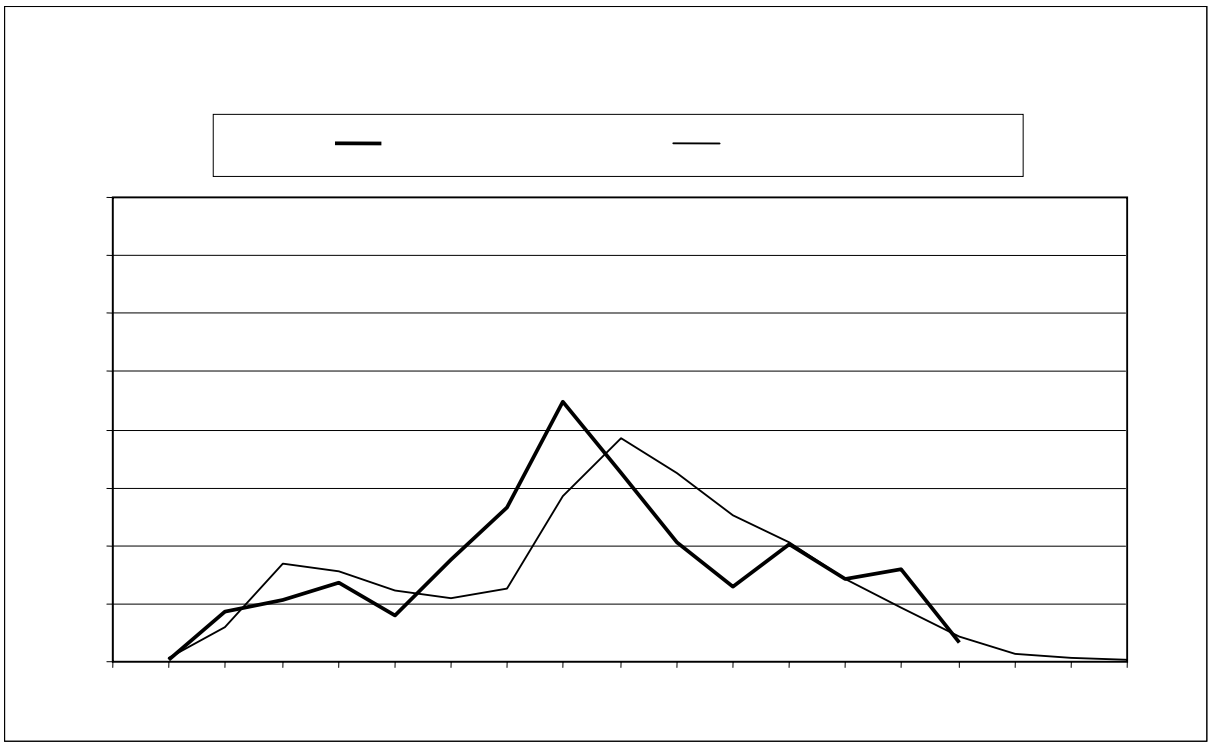


Figure 7.–Page 2 of 3.

-continued-

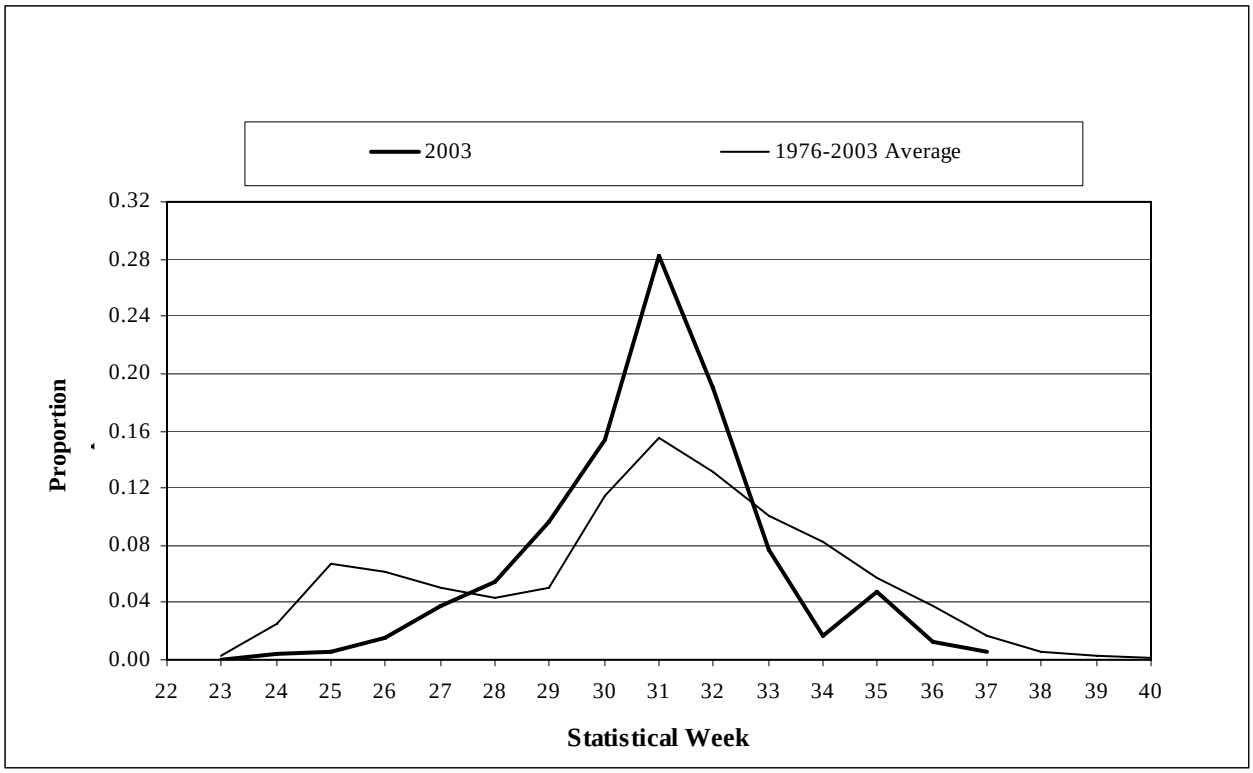


Figure 7.–Page 3 of 3.

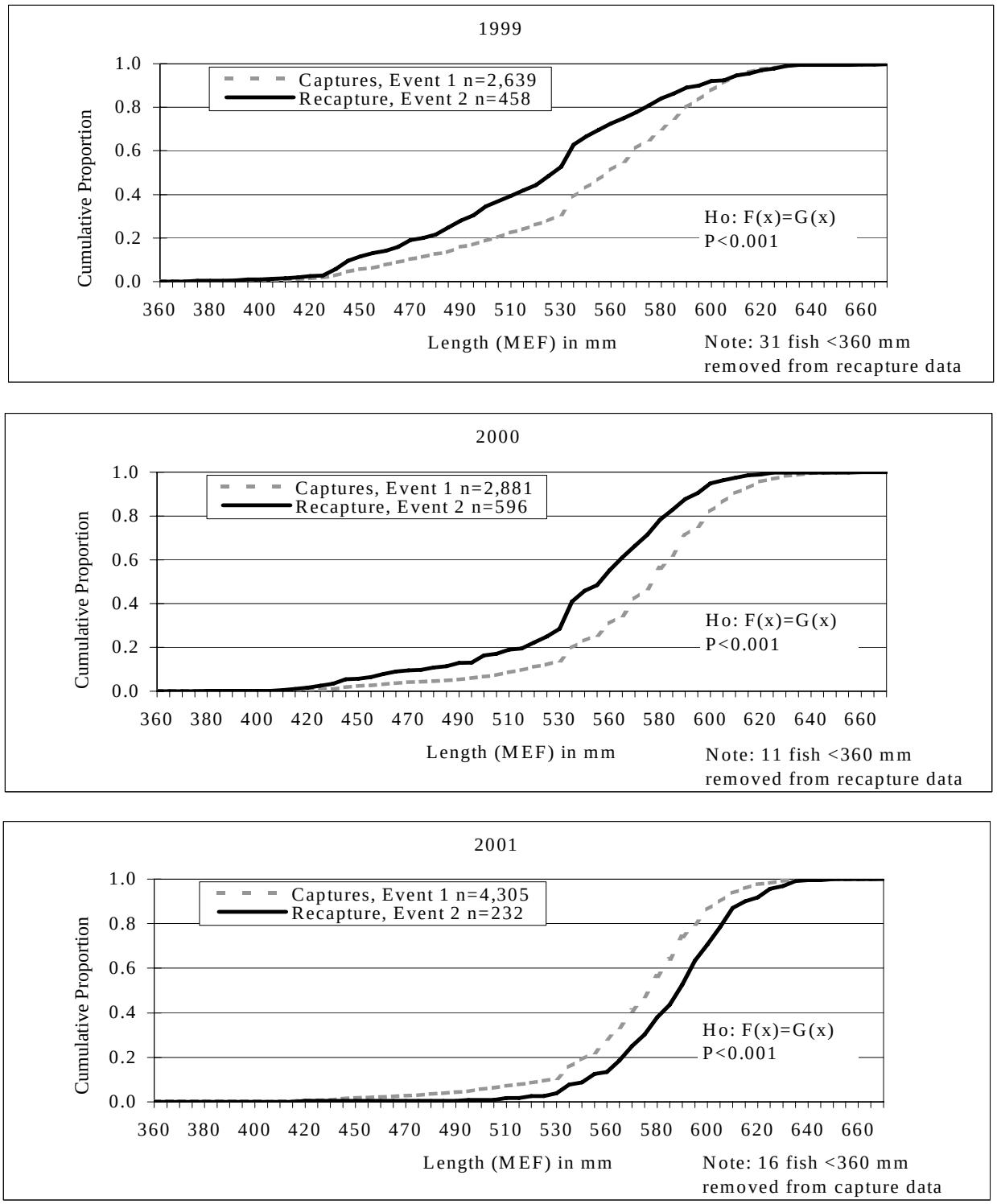


Figure 8.–Cumulative distribution function (CDF) of MEF lengths of sockeye salmon marked on the Chilkoot weir versus lengths of marked fish recaptured on the spawning grounds, 1999–2001.

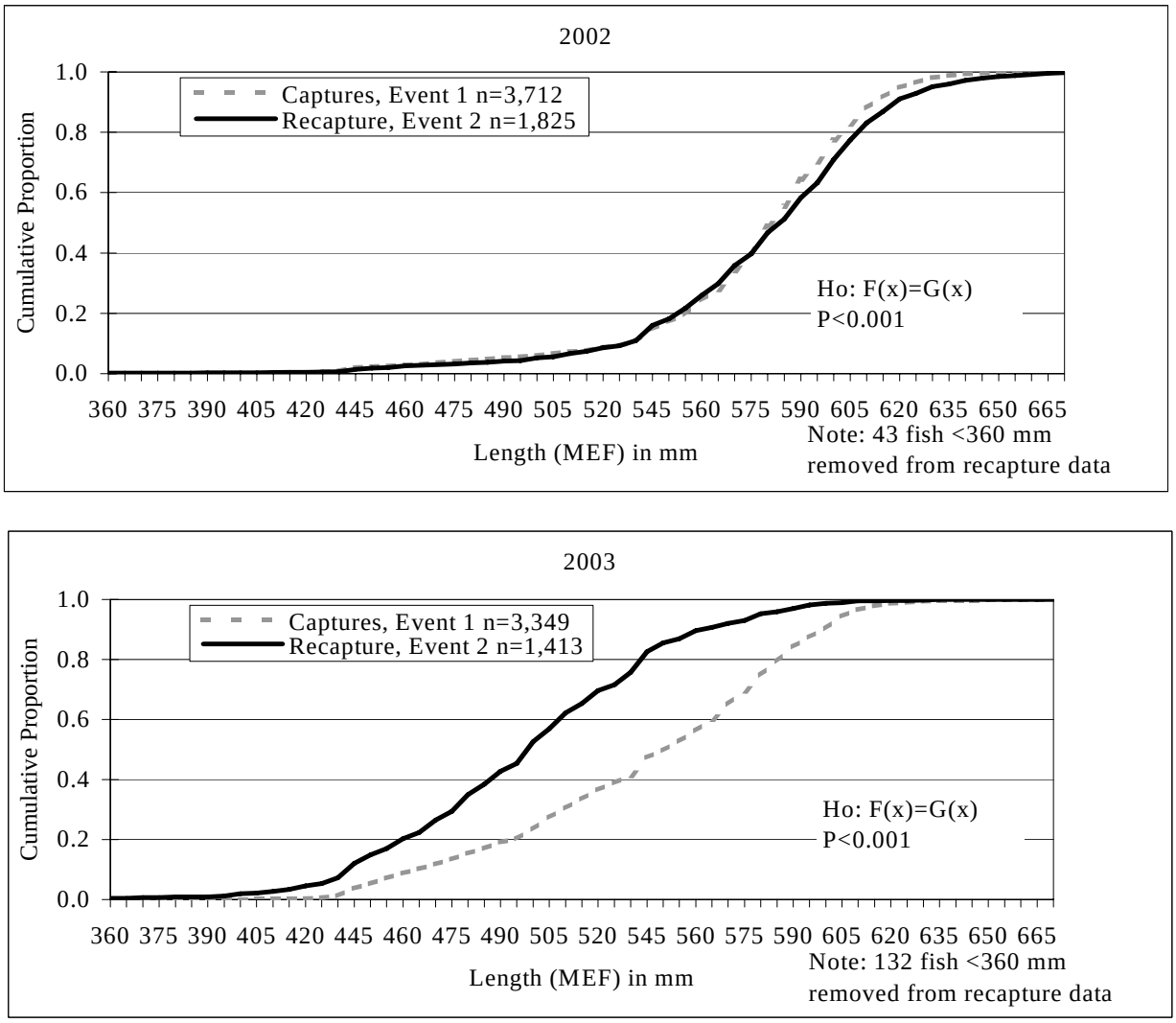


Figure 9.–Cumulative distribution function (CDF) of MEF lengths of sockeye salmon marked on the Chilkoot weir versus lengths of marked fish recaptured on the spawning grounds, 2002 and 2003.

APPENDICES

Appendix A1.–The numbered calendar weeks for 1999–2003.

1999					
Statistical Week	**Beginning Date**	**Ending Date**	**Statistical Week**	**Beginning Date**	**Ending Date**
1	1–Jan	2–Jan	28	4–Jul	10–Jul
2	3–Jan	9–Jan	29	11–Jul	17–Jul
3	10–Jan	16–Jan	30	18–Jul	24–Jul
4	17–Jan	23–Jan	31	25–Jul	31–Jul
5	24–Jan	30–Jan	32	1–Aug	7–Aug
6	31–Jan	6–Feb	33	8–Aug	14–Aug
7	7–Feb	13–Feb	34	15–Aug	21–Aug
8	14–Feb	20–Feb	35	22–Aug	28–Aug
9	21–Feb	27–Feb	36	29–Aug	4–Sep
10	28–Feb	6–Mar	37	5–Sep	11–Sep
11	7–Mar	13–Mar	38	12–Sep	18–Sep
12	14–Mar	20–Mar	39	19–Sep	25–Sep
13	21–Mar	27–Mar	40	26–Sep	2–Oct
14	28–Mar	3–Apr	41	3–Oct	9–Oct
15	4–Apr	10–Apr	42	10–Oct	16–Oct
16	11–Apr	17–Apr	43	17–Oct	23–Oct
17	18–Apr	24–Apr	44	24–Oct	30–Oct
18	25–Apr	1–May	45	31–Oct	6–Nov
19	2–May	8–May	46	7–Nov	13–Nov
20	9–May	15–May	47	14–Nov	20–Nov
21	16–May	22–May	48	21–Nov	27–Nov
22	23–May	29–May	49	28–Nov	4–Dec
23	30–May	5–Jun	50	5–Dec	11–Dec
24	6–Jun	12–Jun	51	12–Dec	18–Dec
25	13–Jun	19–Jun	52	19–Dec	25–Dec
26	20–Jun	26–Jun	53	26–Dec	31–Dec
27	27–Jun	3–Jul			

-continued-

Appendix A1.–Page 2 of 5.

2000					
Statistical Week	**Beginning Date**	**Ending Date**	**Statistical Week**	**Beginning Date**	**Ending Date**
2	2–Jan	8–Jan	29	9–Jul	15–Jul
3	9–Jan	15–Jan	30	16–Jul	22–Jul
4	16–Jan	22–Jan	31	23–Jul	29–Jul
5	23–Jan	29–Jan	32	30–Jul	5–Aug
6	30–Jan	5–Feb	33	6–Aug	12–Aug
7	6–Feb	12–Feb	34	13–Aug	19–Aug
8	13–Feb	19–Feb	35	20–Aug	26–Aug
9	20–Feb	26–Feb	36	27–Aug	2–Sep
10	27–Feb	4–Mar	37	3–Sep	9–Sep
11	5–Mar	11–Mar	38	10–Sep	16–Sep
12	12–Mar	18–Mar	39	17–Sep	23–Sep
13	19–Mar	25–Mar	40	24–Sep	30–Sep
14	26–Mar	1–Apr	41	1–Oct	7–Oct
15	2–Apr	8–Apr	42	8–Oct	14–Oct
16	9–Apr	15–Apr	43	15–Oct	21–Oct
17	16–Apr	22–Apr	44	22–Oct	28–Oct
18	23–Apr	29–Apr	45	29–Oct	4–Nov
19	30–Apr	6–May	46	5–Nov	11–Nov
20	7–May	13–May	47	12–Nov	18–Nov
21	14–May	20–May	48	19–Nov	25–Nov
22	21–May	27–May	49	26–Nov	2–Dec
23	28–May	3–Jun	50	3–Dec	9–Dec
24	4–Jun	10–Jun	51	10–Dec	16–Dec
25	11–Jun	17–Jun	52	17–Dec	23–Dec
26	18–Jun	24–Jun	53	24–Dec	30–Dec
27	25–Jun	1–Jul	54	31–Dec	31–Dec

-continued-

Appendix A1.–Page 3 of 5.

2001					
Statistical Week	**Beginning Date**	**Ending Date**	**Statistical Week**	**Beginning Date**	**Ending Date**
1	1–Jan	6–Jan	28	8–Jul	14–Jul
2	7–Jan	13–Jan	29	15–Jul	21–Jul
3	14–Jan	20–Jan	30	22–Jul	28–Jul
4	21–Jan	27–Jan	31	29–Jul	4–Aug
5	28–Jan	3–Feb	32	5–Aug	11–Aug
6	4–Feb	10–Feb	33	12–Aug	18–Aug
7	11–Feb	17–Feb	34	19–Aug	25–Aug
8	18–Feb	24–Feb	35	26–Aug	1–Sep
9	25–Feb	3–Mar	36	2–Sep	8–Sep
10	4–Mar	10–Mar	37	9–Sep	15–Sep
11	11–Mar	17–Mar	38	16–Sep	22–Sep
12	18–Mar	24–Mar	39	23–Sep	29–Sep
13	25–Mar	31–Mar	40	30–Sep	6–Oct
14	1–Apr	7–Apr	41	7–Oct	13–Oct
15	8–Apr	14–Apr	42	14–Oct	20–Oct
16	15–Apr	21–Apr	43	21–Oct	27–Oct
17	22–Apr	28–Apr	44	28–Oct	3–Nov
18	29–Apr	5–May	45	4–Nov	10–Nov
19	6–May	12–May	46	11–Nov	17–Nov
20	13–May	19–May	47	18–Nov	24–Nov
21	20–May	26–May	48	25–Nov	1–Dec
22	27–May	2–Jun	49	2–Dec	8–Dec
23	3–Jun	9–Jun	50	9–Dec	15–Dec
24	10–Jun	16–Jun	51	16–Dec	22–Dec
25	17–Jun	23–Jun	52	23–Dec	29–Dec
26	24–Jun	30–Jun	53	30–Dec	31–Dec
27	1–Jul	7–Jul			

–continued–

Appendix A1.–Page 4 of 5.

2002					
Statistical Week	**Beginning Date**	**Ending Date**	**Statistical Week**	**Beginning Date**	**Ending Date**
1	1-Jan	5-Jan	28	7-Jul	13-Jul
2	6-Jan	12-Jan	29	14-Jul	20-Jul
3	13-Jan	19-Jan	30	21-Jul	27-Jul
4	20-Jan	26-Jan	31	28-Jul	3-Aug
5	27-Jan	2-Feb	32	4-Aug	10-Aug
6	3-Feb	9-Feb	33	11-Aug	17-Aug
7	10-Feb	16-Feb	34	18-Aug	24-Aug
8	17-Feb	23-Feb	35	25-Aug	31-Aug
9	24-Feb	2-Mar	36	1-Sep	7-Sep
10	3-Mar	9-Mar	37	8-Sep	14-Sep
11	10-Mar	16-Mar	38	15-Sep	21-Sep
12	17-Mar	23-Mar	39	22-Sep	28-Sep
13	24-Mar	30-Mar	40	29-Sep	5-Oct
14	31-Mar	6-Apr	41	6-Oct	12-Oct
15	7-Apr	13-Apr	42	13-Oct	19-Oct
16	14-Apr	20-Apr	43	20-Oct	26-Oct
17	21-Apr	27-Apr	44	27-Oct	2-Nov
18	28-Apr	4-May	45	3-Nov	9-Nov
19	5-May	11-May	46	10-Nov	16-Nov
20	12-May	18-May	47	17-Nov	23-Nov
21	19-May	25-May	48	24-Nov	30-Nov
22	26-May	1-Jun	49	1-Dec	7-Dec
23	2-Jun	8-Jun	50	8-Dec	14-Dec
24	9-Jun	15-Jun	51	15-Dec	21–Dec
25	16–Jun	22–Jun	52	22–Dec	28–Dec
26	23–Jun	29–Jun	53	29–Dec	31–Dec
27	30–Jun	6–Jul			

-continued-

Appendix A1.–Page 5 of 5.

2003					
Statistical Week	**Beginning Date**	**Ending Date**	**Statistical Week**	**Beginning Date**	**Ending Date**
1	1–Jan	4–Jan	28	6–Jul	12–Jul
2	5–Jan	11–Jan	29	13–Jul	19–Jul
3	12–Jan	18–Jan	30	20–Jul	26–Jul
4	19–Jan	25–Jan	31	27–Jul	2–Aug
5	26–Jan	1–Feb	32	3–Aug	9–Aug
6	2–Feb	8–Feb	33	10–Aug	16–Aug
7	9–Feb	15–Feb	34	17–Aug	23–Aug
8	16–Feb	22–Feb	35	24–Aug	30–Aug
9	23–Feb	1–Mar	36	31–Aug	6–Sep
10	2–Mar	8–Mar	37	7–Sep	13–Sep
11	9–Mar	15–Mar	38	14–Sep	20–Sep
12	16–Mar	22–Mar	39	21–Sep	27–Sep
13	23–Mar	29–Mar	40	28–Sep	4–Oct
14	30–Mar	5–Apr	41	5–Oct	11–Oct
15	6–Apr	12–Apr	42	12–Oct	18–Oct
16	13–Apr	19–Apr	43	19–Oct	25–Oct
17	20–Apr	26–Apr	44	26–Oct	1–Nov
18	27–Apr	3–May	45	2–Nov	8–Nov
19	4–May	10–May	46	9–Nov	15–Nov
20	11–May	17–May	47	16–Nov	22–Nov
21	18–May	24–May	48	23–Nov	29–Nov
22	25–May	31–May	49	30–Nov	6–Dec
23	1–Jun	7–Jun	50	7–Dec	13–Dec
24	8–Jun	14–Jun	51	14–Dec	20–Dec
25	15–Jun	21–Jun	52	21–Dec	27–Dec
26	22–Jun	28–Jun	53	28–Dec	31–Dec
27	29–Jun	5–Jul			

Appendix B1.–Daily and cumulative salmon weir counts, water temperature, and stream height for Chilkoot Lake, 1999.

Stat.		Sockeye		Sockeye		Pink		Chum		Coho		Chinook		Water	Water
Week	Date	Daily	Cum.	Marked	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Temp (C)	Level(mm)
23	2-Jun	0	0	0	0	0	0	0	0	0	0	0	0	NA	NA
23	3-Jun	0	0	0	0	0	0	0	0	0	0	0	0	NA	NA
23	4-Jun	0	0	0	0	0	0	0	0	0	0	0	0	NA	NA
23	5-Jun	1	1	0	0	0	0	0	0	0	0	0	0	7	380
24	6-Jun	3	4	0	0	0	0	0	0	0	0	0	0	7.2	475
24	7-Jun	0	4	0	0	0	0	0	0	0	0	0	0	NA	NA
24	8-Jun	2	6	0	0	0	0	0	0	0	0	0	0	6.2	650
24	9-Jun	10	16	4	4	0	0	0	0	0	0	0	0	6.5	680
24	10-Jun	20	36	4	8	0	0	0	0	0	0	0	0	7	635
24	11-Jun	3	39	1	9	0	0	0	0	0	0	0	0	7.5	580
24	12-Jun	21	60	10	19	0	0	0	0	0	0	0	0	7.1	590
25	13-Jun	39	99	14	33	0	0	0	0	0	0	0	0	8.5	655
25	14-Jun	20	119	4	37	0	0	0	0	0	0	0	0	8	735
25	15-Jun	41	160	4	41	0	0	0	0	0	0	0	0	7.3	805
25	16-Jun	1	161	0	41	0	0	0	0	0	0	0	0	7.2	850
25	17-Jun	7	168	0	41	0	0	0	0	0	0	0	0	7	900
25	18-Jun	5	173	2	43	0	0	0	0	0	0	0	0	7.4	795
25	19-Jun	30	203	5	48	0	0	0	0	0	0	0	0	7.7	750
26	20-Jun	24	227	6	54	0	0	0	0	0	0	0	0	7	780
26	21-Jun	32	259	14	68	0	0	0	0	0	0	0	0	7	710
26	22-Jun	59	318	10	78	0	0	0	0	0	0	0	0	5.5	610
26	23-Jun	57	375	18	96	0	0	0	0	0	0	0	0	7	570
26	24-Jun	97	472	7	103	0	0	0	0	0	0	0	0	7	570
26	25-Jun	93	565	19	122	0	0	0	0	0	0	0	0	7	610
26	26-Jun	159	724	30	152	0	0	0	0	0	0	0	0	8	645
27	27-Jun	269	993	51	203	0	0	0	0	0	0	0	0	8	600
27	28-Jun	605	1,598	121	324	0	0	0	0	0	0	0	0	7.8	565
27	29-Jun	176	1,774	37	361	0	0	0	0	0	0	0	0	NA	NA
27	30-Jun	210	1,984	42	403	0	0	0	0	0	0	0	0	7.5	510
27	1-Jul	226	2,210	46	449	0	0	0	0	0	0	0	0	7.5	520
27	2-Jul	225	2,435	45	494	0	0	1	1	0	0	0	0	8	560
27	3-Jul	269	2,704	54	548	0	0	1	2	0	0	0	0	9.5	670
28	4-Jul	92	2,796	44	592	0	0	0	2	0	0	1	1	10.5	740
28	5-Jul	90	2,886	17	609	0	0	0	2	0	0	0	1	10	730
28	6-Jul	44	2,930	9	618	0	0	0	2	0	0	0	1	9	620
28	7-Jul	125	3,055	26	644	0	0	1	3	0	0	1	2	9	565
28	8-Jul	45	3,100	12	656	0	0	0	3	0	0	0	2	8.8	580
28	9-Jul	354	3,454	71	727	0	0	0	3	0	0	0	2	9	540
28	10-Jul	134	3,588	27	754	0	0	0	3	0	0	0	2	10	550
29	11-Jul	116	3,704	24	778	0	0	0	3	0	0	1	3	10	550
29	12-Jul	151	3,855	31	809	4	4	0	3	0	0	3	6	7.5	670
29	13-Jul	91	3,946	34	843	2	6	0	3	0	0	0	6	8	630
29	14-Jul	61	4,007	18	861	1	7	0	3	0	0	1	7	7.5	620

-continued-

Appendix B1.–Page 2 of 3.

Stat.		Sockeye		Sockeye		Pink		Chum		Coho		Chinook		Water	Water
Week	Date	Daily	Cum.	Marked	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Temp (C)	Level(mm)
29	15-Jul	94	4,101	20	881	3	10	0	3	0	0	1	8	9	690
29	16-Jul	41	4,142	13	894	3	13	0	3	0	0	0	8	9.5	730
29	17-Jul	114	4,256	25	919	3	16	0	3	0	0	0	8	10	695
30	18-Jul	101	4,357	21	940	7	23	0	3	0	0	0	8	9.2	640
30	19-Jul	160	4,517	32	972	3	26	3	6	0	0	0	8	9.5	590
30	20-Jul	206	4,723	42	1,014	8	34	3	9	0	0	0	8	10.5	610
30	21-Jul	87	4,810	19	1,033	7	41	1	10	0	0	0	8	9.5	550
30	22-Jul	341	5,151	73	1,106	18	59	4	14	0	0	0	8	9	540
30	23-Jul	323	5,474	67	1,173	28	87	5	19	0	0	0	8	9	520
30	24-Jul	516	5,990	103	1,276	41	128	4	23	0	0	0	8	9.5	580
31	25-Jul	416	6,406	80	1,356	98	226	3	26	0	0	0	8	10	445
31	26-Jul	870	7,276	171	1,527	118	344	5	31	0	0	0	8	8.8	435
31	27-Jul	709	7,985	136	1,663	117	461	3	34	0	0	1	9	9	590
31	28-Jul	208	8,193	45	1,708	55	516	3	37	0	0	1	10	8.5	650
31	29-Jul	89	8,282	20	1,728	47	563	3	40	0	0	2	12	9	650
31	30-Jul	213	8,495	43	1,771	192	755	5	45	0	0	1	13	9	560
31	31-Jul	201	8,696	47	1,818	251	1,006	4	49	0	0	2	15	10	500
32	1-Aug	475	9,171	95	1,913	488	1,494	8	57	0	0	0	15	9.5	530
32	2-Aug	219	9,390	43	1,956	158	1,652	3	60	0	0	0	15	10	600
32	3-Aug	336	9,726	64	2,020	116	1,768	8	68	0	0	0	15	11	615
32	4-Aug	203	9,929	41	2,061	85	1,853	7	75	0	0	0	15	11	615
32	5-Aug	325	10,254	60	2,121	65	1,918	6	81	0	0	2	17	11.2	615
32	6-Aug	249	10,503	51	2,172	76	1,994	9	90	0	0	0	17	11.2	640
32	7-Aug	57	10,560	12	2,184	48	2,042	0	90	0	0	0	17	11	630
33	8-Aug	48	10,608	14	2,198	148	2,190	5	95	0	0	1	18	10.5	590
33	9-Aug	110	10,718	22	2,220	110	2,300	4	99	0	0	1	19	9.5	620
33	10-Aug	153	10,871	35	2,255	186	2,486	2	101	0	0	0	19	10	570
33	11-Aug	150	11,021	30	2,285	235	2,721	2	103	0	0	0	19	10	540
33	12-Aug	154	11,175	31	2,316	683	3,404	4	107	0	0	1	20	10.5	540
33	13-Aug	184	11,359	32	2,348	339	3,743	4	111	0	0	0	20	10.2	500
33	14-Aug	242	11,601	48	2,396	368	4,111	3	114	0	0	1	21	11	530
34	15-Aug	244	11,845	49	2,445	1,153	5,264	1	115	0	0	1	22	11	500
34	16-Aug	129	11,974	33	2,478	813	6,077	2	117	0	0	0	22	10.5	505
34	17-Aug	116	12,090	23	2,501	357	6,434	4	121	0	0	0	22	10.2	520
34	18-Aug	148	12,238	29	2,530	533	6,967	7	128	0	0	1	23	10	510
34	19-Aug	119	12,357	24	2,554	545	7,512	5	133	0	0	1	24	10.5	450
34	20-Aug	217	12,574	43	2,597	448	7,960	6	139	0	0	0	24	10	420
34	21-Aug	135	12,709	27	2,624	572	8,532	7	146	0	0	0	24	10	430
35	22-Aug	399	13,108	80	2,704	312	8,844	3	149	0	0	1	25	9	490
35	23-Aug	596	13,704	115	2,819	332	9,176	5	154	0	0	0	25	9.5	495
35	24-Aug	521	14,225	101	2,920	693	9,869	1	155	0	0	0	25	9.5	430
35	25-Aug	380	14,605	76	2,996	2,194	12,063	0	155	0	0	0	25	9.5	400
35	26-Aug	530	15,135	105	3,101	1,244	13,307	5	160	0	0	0	25	9	400

-continued-

Appendix B1.–Page 3 of 3.

Stat.		Sockeye		Sockeye		Pink		Chum		Coho		Chinook		Water	Water
Week	Date	Daily	Cum.	Marked	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Temp (C)	Level(mm)
35	27-Aug	410	15,545	82	3,183	1,138	14,445	7	167	0	0	0	25	9	370
35	28-Aug	222	15,767	45	3,228	2,504	16,949	10	177	0	0	0	25	10	380
36	29-Aug	360	16,127	72	3,300	697	17,646	11	188	0	0	1	26	9	560
36	30-Aug	183	16,310	36	3,336	742	18,388	9	197	0	0	0	26	8	540
36	31-Aug	235	16,545	47	3,383	1,069	19,457	8	205	0	0	0	26	9	510
36	1-Sep	334	16,879	68	3,451	2,040	21,497	11	216	0	0	0	26	9	450
36	2-Sep	297	17,176	61	3,512	2,091	23,588	18	234	0	0	0	26	9	400
36	3-Sep	424	17,600	84	3,596	2,035	25,623	35	269	0	0	0	26	8.5	415
36	4-Sep	429	18,029	97	3,693	1,037	26,660	24	293	0	0	0	26	8	460
37	5-Sep	202	18,231	42	3,735	1,898	28,558	36	329	1	1	1	27	9	460
37	6-Sep	144	18,375	28	3,763	3,015	31,573	79	408	0	1	0	27	9	370
37	7-Sep	102	18,477	21	3,784	2,045	33,618	44	452	0	1	0	27	8.5	370
37	8-Sep	140	18,617	28	3,812	3,082	36,700	42	494	1	2	0	27	8.5	370
37	9-Sep	166	18,783	34	3,846	6,109	42,809	36	530	0	2	0	27	8.5	380
37	10-Sep	106	18,889	22	3,868	7,562	50,371	58	588	1	3	0	27	9	38
37	11-Sep	130	19,019	26	3,894	5,686	56,057	49	637	0	3	0	27	8	33
38	12-Sep	131	19,150	30	3,924	3,088	59,145	31	668	3	6	0	27	8	38
38	13-Sep	134	19,284	28	3,952	3,225	62,370	45	713	5	11	0	27	8	37

Appendix B2.–Daily and cumulative salmon weir counts, water temperature, and stream height for Chilkoot Lake, 2000.

Stat.		Sockeye		Sockeye		Pink		Chum		Coho		Chinook		Water	Water
Week	Date	Daily	Cum.	Marked	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Temp (C)	Level(mm)
23	3-Jun	0	0	0	0	0	0	0	0	0	0	0	0	NA	NA
24	4-Jun	0	0	0	0	0	0	0	0	0	0	0	0	NA	NA
24	5-Jun	16	16	1	1	0	0	0	0	0	0	0	0	7.5	146
24	6-Jun	10	26	1	2	0	0	0	0	0	0	0	0	8	149
24	7-Jun	17	43	1	3	0	0	0	0	0	0	0	0	8.5	157
24	8-Jun	42	85	5	8	0	0	0	0	0	0	0	0	8.5	157
24	9-Jun	21	106	4	12	0	0	0	0	0	0	0	0	7	155
24	10-Jun	68	174	4	16	0	0	0	0	0	0	0	0	8	157
25	11-Jun	25	199	2	18	0	0	0	0	0	0	0	0	7.5	162
25	12-Jun	60	259	5	23	0	0	0	0	0	0	0	0	7	162
25	13-Jun	12	271	0	23	0	0	1	1	0	0	0	0	7	162
25	14-Jun	59	330	10	33	0	0	0	1	0	0	0	0	7	162
25	15-Jun	47	377	5	38	0	0	0	1	0	0	0	0	7	162
25	16-Jun	62	439	9	47	0	0	0	1	0	0	0	0	7	162
25	17-Jun	148	587	15	62	0	0	0	1	0	0	0	0	6.5	156
26	18-Jun	76	663	7	69	0	0	1	2	0	0	0	0	7	153
26	19-Jun	265	928	27	96	0	0	0	2	0	0	0	0	7	150
26	20-Jun	382	1,310	38	134	0	0	0	2	0	0	0	0	6.5	149
26	21-Jun	379	1,689	38	172	0	0	0	2	0	0	0	0	6.5	152
26	22-Jun	699	2,388	65	237	0	0	0	2	0	0	0	0	6.5	148
26	23-Jun	435	2,823	43	280	0	0	0	2	0	0	0	0	7.5	142
26	24-Jun	258	3,081	26	306	0	0	0	2	0	0	0	0	7.5	146
27	25-Jun	472	3,553	47	353	0	0	0	2	0	0	0	0	7.5	154
27	26-Jun	399	3,952	44	397	0	0	0	2	0	0	0	0	8	157
27	27-Jun	362	4,314	36	433	0	0	0	2	0	0	0	0	8	164
27	28-Jun	432	4,746	43	476	0	0	1	3	0	0	0	0	8.5	164
27	29-Jun	37	4,783	3	479	0	0	0	3	0	0	0	0	8	171
27	30-Jun	204	4,987	22	501	0	0	0	3	0	0	0	0	8	168
27	1-Jul	302	5,289	30	531	0	0	2	5	0	0	0	0	8.3	163
28	2-Jul	142	5,431	14	545	0	0	2	7	0	0	0	0	8	163
28	3-Jul	101	5,532	10	555	0	0	0	7	0	0	0	0	8	148
28	4-Jul	565	6,097	56	611	0	0	2	9	0	0	0	0	8	146
28	5-Jul	316	6,413	38	649	0	0	1	10	0	0	0	0	8	164
28	6-Jul	1,042	7,455	57	706	0	0	6	16	0	0	0	0	8.5	168
28	7-Jul	330	7,785	40	746	0	0	0	16	0	0	0	0	8.5	164
28	8-Jul	62	7,847	21	767	0	0	0	16	0	0	0	0	8.5	160
29	9-Jul	284	8,131	32	799	0	0	9	25	0	0	0	0	8.5	161
29	10-Jul	100	8,231	16	815	0	0	2	27	0	0	0	0	9	159
29	11-Jul	321	8,552	37	852	0	0	7	34	0	0	0	0	8.5	160
29	12-Jul	158	8,710	25	877	0	0	0	34	0	0	0	0	8.5	158
29	13-Jul	793	9,503	79	956	5	5	16	50	0	0	0	0	8	153
29	14-Jul	800	10,303	80	1,036	3	8	14	64	0	0	0	0	8.5	148

-continued-

Appendix B2.–Page 2 of 3.

Stat.		Sockeye		Sockeye		Pink		Chum		Coho		Chinook		Water	Water
Week	Date	Daily	Cum.	Marked	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Temp (C)	Level(mm)
29	15-Jul	929	11,232	87	1,123	4	12	16	80	0	0	0	0	9	144
30	16-Jul	364	11,596	36	1,159	2	14	9	89	0	0	0	0	9	144
30	17-Jul	721	12,317	72	1,231	0	14	17	106	0	0	0	0	8	147
30	18-Jul	602	12,919	60	1,291	28	42	16	122	0	0	0	0	9	155
30	19-Jul	1,174	14,093	117	1,408	39	81	26	148	0	0	1	1	8	154
30	20-Jul	513	14,606	52	1,460	21	102	9	157	0	0	0	1	7	159
30	21-Jul	877	15,483	96	1,556	29	131	25	182	0	0	2	3	8	160
30	22-Jul	903	16,386	82	1,638	20	151	26	208	0	0	1	4	8	154
31	23-Jul	286	16,672	40	1,678	8	159	4	212	0	0	0	4	8	171
31	24-Jul	326	16,998	37	1,715	14	173	18	230	0	0	0	4	7	174
31	25-Jul	546	17,544	55	1,770	17	190	16	246	0	0	0	4	8	165
31	26-Jul	244	17,788	27	1,797	30	220	10	256	0	0	2	6	8	152
31	27-Jul	1,300	19,088	130	1,927	134	354	54	310	0	0	0	6	8	150
31	28-Jul	520	19,608	54	1,981	61	415	10	320	0	0	0	6	8	151
31	29-Jul	1,534	21,142	137	2,118	228	643	21	341	0	0	0	6	8	154
32	30-Jul	803	21,945	80	2,198	121	764	14	355	0	0	0	6	8	153
32	31-Jul	1,009	22,954	101	2,299	336	1,100	6	361	0	0	0	6	8	154
32	1-Aug	764	23,718	80	2,379	126	1,226	5	366	0	0	0	6	8	161
32	2-Aug	479	24,197	47	2,426	133	1,359	14	380	0	0	0	6	8	151
32	3-Aug	907	25,104	91	2,517	200	1,559	11	391	0	0	0	6	8	148
32	4-Aug	1,414	26,518	137	2,654	419	1,978	28	419	0	0	0	6	8	150
32	5-Aug	983	27,501	98	2,752	413	2,391	20	439	0	0	0	6	9	154
33	6-Aug	613	28,114	61	2,813	111	2,502	6	445	0	0	1	7	8.5	156
33	7-Aug	448	28,562	45	2,858	148	2,650	8	453	0	0	0	7	8	152
33	8-Aug	2,207	30,769	170	3,028	341	2,991	9	462	0	0	0	7	8	149
33	9-Aug	1,193	31,962	119	3,147	436	3,427	19	481	0	0	0	7	9.5	142
33	10-Aug	1,082	33,044	102	3,249	545	3,972	12	493	0	0	0	7	10.5	141
33	11-Aug	274	33,318	48	3,297	206	4,178	8	501	0	0	0	7	9.5	139
33	12-Aug	527	33,845	54	3,351	442	4,620	6	507	0	0	0	7	9.5	140
34	13-Aug	810	34,655	80	3,431	447	5,067	5	512	0	0	1	8	9.5	139
34	14-Aug	231	34,886	37	3,468	383	5,450	6	518	0	0	0	8	9	140
34	15-Aug	935	35,821	115	3,583	487	5,937	4	522	0	0	0	8	8	159
34	16-Aug	111	35,932	13	3,596	139	6,076	3	525	0	0	0	8	9	166
34	17-Aug	239	36,171	29	3,625	212	6,288	5	530	0	0	0	8	9	158
34	18-Aug	85	36,256	19	3,644	183	6,471	4	534	0	0	0	8	9	152
34	19-Aug	288	36,544	23	3,667	541	7,012	12	546	0	0	0	8	8.5	146
35	20-Aug	700	37,244	70	3,737	364	7,376	10	556	0	0	0	8	8	149
35	21-Aug	312	37,556	36	3,773	163	7,539	2	558	0	0	1	9	8	158
35	22-Aug	704	38,260	66	3,839	484	8,023	13	571	0	0	0	9	8	152
35	23-Aug	276	38,536	27	3,866	712	8,735	5	576	0	0	0	9	7.5	152
35	24-Aug	508	39,044	59	3,925	857	9,592	13	589	0	0	0	9	8.5	141
35	25-Aug	237	39,281	11	3,936	688	10,280	8	597	0	0	0	9	8.5	138

-continued-

Appendix B2.–Page 3 of 3.

Stat.		Sockeye		Sockeye		Pink		Chum		Coho		Chinook		Water	Water
Week	Date	Daily	Cum.	Marked	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Temp (C)	Level(mm)
35	26-Aug	330	39,611	35	3,971	572	10,852	4	601	0	0	0	9	8.5	134
36	27-Aug	146	39,757	23	3,994	246	11,098	12	613	1	1	0	9	8	135
36	28-Aug	1,025	40,782	85	4,079	1,250	12,348	22	635	2	3	0	9	7.5	134
36	29-Aug	501	41,283	52	4,131	1,014	13,362	25	660	3	6	0	9	8	132
36	30-Aug	288	41,571	38	4,169	776	14,138	24	684	1	7	0	9	8	130
36	31-Aug	832	42,403	70	4,239	1,100	15,238	46	730	2	9	0	9	8	129
36	1-Sep	278	42,681	30	4,269	1,015	16,253	39	769	0	9	1	10	8.5	130
36	2-Sep	176	42,857	17	4,286	2,386	18,639	80	849	4	13	0	10	8	128
37	3-Sep	134	42,991	24	4,310	845	19,484	30	879	6	19	0	10	8	121
37	4-Sep	114	43,105	12	4,322	1,088	20,572	32	911	7	26	0	10	8	121
37	5-Sep	147	43,252	18	4,340	622	21,194	26	937	2	28	0	10	7.5	129
37	6-Sep	20	43,272	0	4,340	65	21,259	0	937	1	29	0	10	7.5	145
37	7-Sep	40	43,312	33	4,373	32	21,291	6	943	0	29	0	10	7.5	160
37	8-Sep	54	43,366	8	4,381	159	21,450	10	953	1	30	0	10	7.5	150
37	9-Sep	50	43,416	0	4,381	1,000	22,450	28	981	5	35	0	10	7	142
38	10-Sep	58	43,474	5	4,386	641	23,091	31	1,012	4	39	0	10	7	135
38	11-Sep	37	43,511	0	4,386	290	23,381	18	1,030	3	42	0	10	6.5	131
38	12-Sep	44	43,555	0	4,386	255	23,636	20	1,050	5	47	0	10	6.5	130

Appendix B3.–Daily and cumulative salmon weir counts, water temperature, and stream height for Chilkoot Lake, 2001.

Stat.		Sockeye		Sockeye		Pink		Chum		Coho		Chinook		Water	Water
Week	Date	Daily	Cum.	Marked	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Temp (C)	Level(mm)
23	7-Jun	17	17	11	11	0	0	0	0	0	0	0	0	NA	NA
23	8-Jun	51	68	7	18	0	0	0	0	0	0	0	0	7.5	153
23	9-Jun	21	89	2	20	0	0	0	0	0	0	0	0	9	159
24	10-Jun	6	95	2	22	0	0	0	0	0	0	0	0	7.5	159
24	11-Jun	68	163	8	30	0	0	0	0	0	0	0	0	7.5	158
24	12-Jun	14	177	3	33	0	0	0	0	0	0	0	0	8.5	161
24	13-Jun	12	189	3	36	0	0	0	0	0	0	0	0	8	161
24	14-Jun	53	242	4	40	0	0	0	0	0	0	0	0	8.5	161
24	15-Jun	26	268	2	42	0	0	0	0	0	0	0	0	8.5	156
24	16-Jun	86	354	8	50	0	0	0	0	0	0	0	0	8.5	154
25	17-Jun	244	598	8	58	0	0	0	0	0	0	0	0	8.5	162
25	18-Jun	227	825	8	66	0	0	0	0	0	0	0	0	8.5	163
25	19-Jun	158	983	30	96	0	0	0	0	0	0	0	0	8.5	161
25	20-Jun	572	1,555	41	137	0	0	2	2	0	0	0	0	8	160
25	21-Jun	205	1,760	40	177	0	0	3	5	0	0	0	0	8	167
25	22-Jun	593	2,353	35	212	0	0	1	6	0	0	0	0	7.5	167
25	23-Jun	812	3,165	49	261	0	0	0	6	0	0	0	0	8	163
26	24-Jun	1,230	4,395	132	393	0	0	0	6	0	0	0	0	8	163
26	25-Jun	172	4,567	18	411	0	0	0	6	0	0	0	0	9	163
26	26-Jun	1,116	5,683	113	524	0	0	8	14	0	0	0	0	8	161
26	27-Jun	631	6,314	68	592	0	0	3	17	0	0	1	1	10	159
26	28-Jun	245	6,559	25	617	0	0	0	17	0	0	0	1	10	166
26	29-Jun	570	7,129	65	682	3	3	3	20	0	0	0	1	8.2	167
26	30-Jun	207	7,336	26	708	1	4	3	23	0	0	0	1	9	167
27	1-Jul	877	8,213	93	801	0	4	24	47	0	0	1	2	8.2	164
27	2-Jul	89	8,302	11	812	0	4	0	47	0	0	0	2	10	163
27	3-Jul	616	8,918	80	892	0	4	11	58	0	0	1	3	8.5	161
27	4-Jul	331	9,249	30	922	1	5	11	69	0	0	1	4	10	165
27	5-Jul	209	9,458	22	944	0	5	2	71	0	0	0	4	6	160
27	6-Jul	880	10,338	86	1,030	16	21	24	95	0	0	0	4	6	159
27	7-Jul	123	10,461	11	1,041	0	21	9	104	0	0	0	4	7.5	162
28	8-Jul	294	10,755	40	1,081	12	33	16	120	0	0	0	4	6.5	166
28	9-Jul	575	11,330	62	1,143	12	45	8	128	0	0	0	4	6.8	161
28	10-Jul	462	11,792	50	1,193	24	69	12	140	0	0	0	4	7	155
28	11-Jul	190	11,982	41	1,234	10	79	7	147	0	0	0	4	7	151
28	12-Jul	349	12,331	35	1,269	18	97	11	158	0	0	0	4	7	151
28	13-Jul	731	13,062	37	1,306	4	101	11	169	0	0	2	6	7	145
28	14-Jul	482	13,544	48	1,354	12	113	5	174	0	0	0	6	8	148
29	15-Jul	515	14,059	53	1,407	2	115	2	176	0	0	0	6	7	153
29	16-Jul	1,414	15,473	143	1,550	31	146	8	184	0	0	0	6	8	157
29	17-Jul	818	16,291	90	1,640	23	169	6	190	0	0	1	7	8.5	156
29	18-Jul	1,455	17,746	142	1,782	66	235	14	204	0	0	1	8	8.5	157

-continued-

Appendix B3.–Page 2 of 3.

Stat.		Sockeye		Sockeye		Pink		Chum		Coho		Chinook		Water	Water
Week	Date	Daily	Cum.	Marked	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Temp (C)	Level(mm)
29	19-Jul	1,307	19,053	131	1,913	128	363	12	216	0	0	1	9	8	162
29	20-Jul	885	19,938	91	2,004	291	654	11	227	0	0	0	9	9.5	171
29	21-Jul	1,559	21,497	153	2,157	146	800	10	237	0	0	1	10	9.7	172
30	22-Jul	1,032	22,529	112	2,269	133	933	20	257	0	0	0	10	9.6	170
30	23-Jul	863	23,392	83	2,352	91	1,024	3	260	0	0	1	11	7.5	173
30	24-Jul	1,434	24,826	60	2,412	58	1,082	3	263	0	0	0	11	8	166
30	25-Jul	2,164	26,990	115	2,527	103	1,185	1	264	0	0	0	11	8.5	158
30	26-Jul	1,736	28,726	190	2,717	86	1,271	3	267	0	0	0	11	8	154
30	27-Jul	1,673	30,399	165	2,882	80	1,351	10	277	0	0	0	11	8.5	151
30	28-Jul	2,266	32,665	227	3,109	132	1,483	15	292	0	0	0	11	8	152
31	29-Jul	1,592	34,257	160	3,269	121	1,604	12	304	0	0	1	12	8.5	151
31	30-Jul	1,914	36,171	195	3,464	162	1,766	30	334	0	0	1	13	8.5	148
31	31-Jul	2,413	38,584	250	3,714	371	2,137	54	388	0	0	0	13	8.5	145
31	1-Aug	4,841	43,425	222	3,936	671	2,808	17	405	0	0	0	13	9	143
31	2-Aug	4,186	47,611	214	4,150	583	3,391	8	413	0	0	2	15	9.2	143
31	3-Aug	2,830	50,441	152	4,302	229	3,620	7	420	0	0	0	15	8.5	148
31	4-Aug	3,704	54,145	191	4,493	284	3,904	1	421	0	0	3	18	8.9	150
32	5-Aug	2,585	56,730	134	4,627	205	4,109	2	423	0	0	0	18	9.9	148
32	6-Aug	2,918	59,648	170	4,797	392	4,501	5	428	0	0	0	18	9.5	145
32	7-Aug	1,919	61,567	106	4,903	270	4,771	4	432	0	0	0	18	9	142
32	8-Aug	1,253	62,820	130	5,033	168	4,939	2	434	0	0	0	18	9.5	141
32	9-Aug	806	63,626	81	5,114	262	5,201		434	0	0	0	18	9.5	141
32	10-Aug	982	64,608	100	5,214	426	5,627	1	435	0	0	0	18	9.5	141
32	11-Aug	768	65,376	80	5,294	1037	6,664	3	438	0	0	0	18	9.5	140
33	12-Aug	523	65,899	57	5,351	671	7,335	2	440	0	0	1	19	9.5	138
33	13-Aug	909	66,808	93	5,444	564	7,899	13	453	0	0	1	20	9	141
33	14-Aug	689	67,497	80	5,524	418	8,317	2	455	0	0	0	20	10	146
33	15-Aug	1,212	68,709	123	5,647	856	9,173	2	457	0	0	0	20	10	148
33	16-Aug	539	69,248	68	5,715	651	9,824	1	458	0	0	0	20	10	147
33	17-Aug	619	69,867	73	5,788	1115	10,939	0	458	0	0	0	20	10	144
33	18-Aug	603	70,470	56	5,844	2837	13,776	5	463	0	0	2	22	10	142
34	19-Aug	192	70,662	34	5,878	714	14,490	0	463	0	0	0	22	10	142
34	20-Aug	709	71,371	71	5,949	1178	15,668	0	463	0	0	0	22	9.5	142
34	21-Aug	581	71,952	60	6,009	2165	17,833	0	463	0	0	0	22	10.5	144
34	22-Aug	305	72,257	40	6,049	2031	19,864	1	464	0	0	1	23	11	142
34	23-Aug	141	72,398	40	6,089	1308	21,172	5	469	0	0	0	23	9.5	140
34	24-Aug	158	72,556	4	6,093	2846	24,018	1	470	0	0	1	24	9	134
34	25-Aug	234	72,790	29	6,122	1074	25,092	2	472	0	0	0	24	9	133
35	26-Aug	176	72,966	10	6,132	545	25,637	3	475	0	0	0	24	8.5	133
35	27-Aug	528	73,494	52	6,184	842	26,479	29	504	0	0	0	24	9	136
35	28-Aug	223	73,717	11	6,195	250	26,729	8	512	0	0	0	24	9	137
35	29-Aug	418	74,135	0	6,195	401	27,130	21	533	0	0	0	24	8.5	136

-continued-

Appendix B3.–Page 3 of 3.

Stat.		Sockeye		Sockeye		Pink		Chum		Coho		Chinook		Water	Water
Week	Date	Daily	Cum.	Marked	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Temp (C)	Level(mm)
35	30-Aug	279	74,414	24	6,219	482	27,612	14	547	1	1	0	24	9	141
35	31-Aug	245	74,659	25	6,244	442	28,054	27	574	2	3	0	24	9	149
35	1-Sep	195	74,854	24	6,268	370	28,424	17	591	0	3	0	24	8.5	149
36	2-Sep	204	75,058	20	6,288	377	28,801	10	601	1	4	0	24	9	142
36	3-Sep	248	75,306	25	6,313	367	29,168	24	625	6	10	0	24	8.5	137
36	4-Sep	158	75,464	21	6,334	291	29,459	13	638	7	17	0	24	9	135
36	5-Sep	65	75,529	12	6,346	232	29,691	10	648	1	18	0	24	7.5	132
36	6-Sep	285	75,814	10	6,356	580	30,271	38	686	32	50	0	24	7	140
36	7-Sep	70	75,884	12	6,368	154	30,425	7	693	12	62	0	24	7	136
36	8-Sep	152	76,036	0	6,368	311	30,736	22	715	7	69	0	24	7.5	147
37	9-Sep	79	76,115	0	6,368	213	30,949	21	736	7	76	0	24	7.5	141
37	10-Sep	90	76,205	0	6,368	577	31,526	28	764	13	89	0	24	7	132
37	11-Sep	50	76,255	0	6,368	477	32,003	28	792	6	95	0	24	7	137
37	12-Sep	28	76,283	0	6,368	291	32,294	18	810	8	103	0	24	7	123

Appendix B4.–Daily and cumulative salmon weir counts, water temperature, and stream height for Chilkoot Lake, 2002.

Stat.		Sockeye		Sockeye		Pink		Chum		Coho		Chinook		Water	Water
Week	Date	Daily	Cum.	Marked	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Temp(C)	Level(mm)
23	8–Jun	102	102	25	25	0	0	0	0	0	0	0	0	7	144
24	9–Jun	158	260	21	46	0	0	0	0	0	0	0	0	7.5	146
24	10–Jun	392	652	12	58	0	0	0	0	0	0	0	0	5.8	152
24	11–Jun	453	1,105	58	116	0	0	0	0	0	0	0	0	5	153
24	12–Jun	133	1,238	20	136	0	0	0	0	0	0	0	0	6.2	146
24	13–Jun	138	1,376	20	156	0	0	0	0	0	0	0	0	6.2	143
24	14–Jun	427	1,803	31	187	0	0	0	0	0	0	0	0	7.2	146
24	15–Jun	304	2,107	25	212	0	0	0	0	0	0	0	0	7	161
25	16–Jun	232	2,339	21	233	0	0	0	0	0	0	0	0	7.5	170
25	17–Jun	452	2,791	49	282	0	0	0	0	0	0	0	0	8	170
25	18–Jun	32	2,823	8	290	0	0	0	0	0	0	0	0	7.5	165
25	19–Jun	148	2,971	12	302	0	0	0	0	0	0	0	0	8	157
25	20–Jun	484	3,455	45	347	0	0	0	0	0	0	0	0	5.5	150
25	21–Jun	710	4,165	69	416	0	0	0	0	0	0	0	0	6.8	146
25	22–Jun	393	4,558	41	457	0	0	0	0	0	0	0	0	7.5	140
26	23–Jun	682	5,240	66	523	0	0	0	0	0	0	0	0	7.5	142
26	24–Jun	550	5,790	52	575	0	0	0	0	0	0	1	1	8.5	143
26	25–Jun	933	6,723	92	667	0	0	3	3	0	0	1	2	7.5	150
26	26–Jun	109	6,832	24	691	0	0	0	3	0	0	0	2	8.7	160
26	27–Jun	351	7,183	33	724	0	0	0	3	0	0	0	2	7.2	158
26	28–Jun	275	7,458	23	747	0	0	1	4	0	0	2	4	7.5	151
26	29–Jun	295	7,753	50	797	0	0	1	5	0	0	0	4	8	149
27	30–Jun	674	8,427	52	849	0	0	1	6	0	0	0	4	8	150
27	1–Jul	129	8,556	25	874	0	0	1	7	0	0	0	4	8	150
27	2–Jul	217	8,773	25	899	0	0	2	9	0	0	1	5	8	146
27	3–Jul	229	9,002	40	939	0	0	7	16	0	0	1	6	8	144
27	4–Jul	71	9,073	2	941	0	0	2	18	0	0	0	6	7.5	144
27	5–Jul	352	9,425	5	946	2	2	0	18	0	0	0	6	7.5	141
27	6–Jul	197	9,622	16	962	2	4	0	18	0	0	0	6	8	141
28	7–Jul	124	9,746	17	979	0	4	0	18	0	0	0	6	8.8	140
28	8–Jul	369	10,115	32	1,011	4	8	2	20	0	0	1	7	8	143
28	9–Jul	100	10,215	14	1,025	0	8	2	22	0	0	0	7	8.5	147
28	10–Jul	850	11,065	85	1,110	12	20	20	42	0	0	1	8	9.5	144
28	11–Jul	960	12,025	103	1,213	13	33	9	51	0	0	1	9	9.5	143
28	12–Jul	1,104	13,129	95	1,308	11	44	2	53	0	0	1	10	8	140
28	13–Jul	631	13,760	74	1,382	5	49	5	58	0	0	2	12	9.5	140
29	14–Jul	686	14,446	65	1,447	3	52	6	64	0	0	2	14	9	138
29	15–Jul	269	14,715	39	1,486	1	53	1	65	0	0	1	15	9.2	139
29	16–Jul	1,022	15,737	90	1,576	5	58	4	69	0	0	1	16	9.8	140
29	17–Jul	944	16,681	93	1,669	14	72	1	70	0	0	0	16	8.8	140
29	18–Jul	909	17,590	92	1,761	19	91	1	71	0	0	2	18	9.2	144
29	19–Jul	1,449	19,039	146	1,907	20	111	9	80	0	0	1	19	9.5	144

-continued-

Appendix B4.–Page 2 of 3.

Stat.		Sockeye		Sockeye		Pink		Chum		Coho		Chinook		Water	Water
Week	Date	Daily	Cum.	Marked	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Tem(C)	Level(mm)
29	20-Jul	914	19,953	97	2,004	16	127	0	80	0	0	0	19	9.5	142
30	21–Jul	2,480	22,433	161	2,165	108	235	7	87	0	0	3	22	9.5	140
30	22–Jul	2,867	25,300	146	2,311	345	580	8	95	0	0	1	23	9.8	142
30	23–Jul	2,141	27,441	107	2,418	674	1,254	4	99	0	0	3	26	9.3	144
30	24–Jul	1,037	28,478	63	2,481	193	1,447	5	104	0	0	1	27	9	147
30	25–Jul	728	29,206	62	2,543	118	1,565	1	105	0	0	0	27	8	156
30	26–Jul	378	29,584	40	2,583	121	1,686	2	107	0	0	1	28	9	152
30	27–Jul	802	30,386	80	2,663	117	1,803	3	110	0	0	1	29	7.9	144
31	28–Jul	875	31,261	93	2,756	172	1,975	2	112	0	0	1	30	7.8	144
31	29–Jul	759	32,020	72	2,828	142	2,117	2	114	0	0	0	30	8.5	140
31	30–Jul	1,057	33,077	115	2,943	348	2,465	1	115	0	0	0	30	9	137
31	31–Jul	1,414	34,491	104	3,047	580	3,045	1	116	0	0	1	31	10	137
31	1–Aug	2,018	36,509	110	3,157	1046	4,091	3	119	0	0	1	32	9.5	138
31	2–Aug	792	37,301	80	3,237	783	4,874	3	122	0	0	0	32	10.6	137
31	3–Aug	684	37,985	78	3,315	682	5,556	3	125	0	0	0	32	11.5	135
32	4–Aug	715	38,700	63	3,378	1244	6,800	0	125	0	0	0	32	10	135
32	5–Aug	683	39,383	67	3,445	826	7,626	2	127	0	0	0	32	9.8	136
32	6–Aug	590	39,973	66	3,511	1168	8,794	2	129	0	0	0	32	10	136
32	7–Aug	667	40,640	62	3,573	904	9,698	0	129	0	0	0	32	8	136
32	8–Aug	792	41,432	78	3,651	1034	10,732	3	132	0	0	0	32	8.9	151
32	9–Aug	616	42,048	66	3,717	588	11,320	1	133	0	0	0	32	10	155
32	10–Aug	712	42,760	71	3,788	1768	13,088	0	133	0	0	0	32	9	147
33	11–Aug	505	43,265	62	3,850	996	14,084	1	134	0	0	0	32	8.5	140
33	12–Aug	550	43,815	43	3,893	380	14,464	0	134	0	0	0	32	8.6	140
33	13–Aug	683	44,498	73	3,966	176	14,640	0	134	1	1	0	32	7.8	164
33	14–Aug	367	44,865	40	4,006	1280	15,920	1	135	0	1	1	33	9.2	154
33	15–Aug	187	45,052	25	4,031	4100	20,020	1	136	0	1	0	33	8.5	146
33	16–Aug	252	45,304	10	4,041	9635	29,655	1	137	0	1	0	33	9	139
33	17–Aug	450	45,754	51	4,092	7703	37,358	1	138	1	2	0	33	9.1	134
34	18–Aug	678	46,432	65	4,157	8945	46,303	0	138	0	2	1	34	9.9	129
34	19–Aug	840	47,272	81	4,238	3524	49,827	0	138	0	2	0	34	9	126
34	20–Aug	670	47,942	68	4,306	2000	51,827	1	139	0	2	0	34	9	127
34	21–Aug	728	48,670	80	4,386	1677	53,504	1	140	0	2	1	35	8.5	128
34	22–Aug	948	49,618	105	4,491	1054	54,558	1	141	0	2	1	36	8.5	146
34	23–Aug	574	50,192	44	4,535	1231	55,789	0	141	0	2	0	36	9.2	156
34	24–Aug	326	50,518	40	4,575	930	56,719	0	141	0	2	0	36	8.8	153
35	25–Aug	423	50,941	40	4,615	2795	59,514	3	144	0	2	0	36	9	143
35	26–Aug	707	51,648	62	4,677	2579	62,093	4	148	0	2	0	36	NA	137
35	27–Aug	619	52,267	66	4,743	2127	64,220	3	151	0	2	0	36	NA	135
35	28–Aug	437	52,704	43	4,786	678	64,898	6	157	0	2	0	36	8.9	150
35	29–Aug	240	52,944	37	4,823	336	65,234	1	158	0	2	0	36	8.6	157
35	30–Aug	457	53,401	34	4,857	579	65,813	0	158	1	3	0	36	8.8	150

-continued-

Appendix B4.–Page 3 of 3.

Stat.		Sockeye		Sockeye		Pink		Chum		Coho		Chinook		Water	Water
Week	Date	Daily	Cum.	Marked	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Temp(C)	Level(mm)
35	31–Aug	439	53,840	50	4,907	759	66,572	6	164	0	3	0	36	8.8	146
36	1–Sep	480	54,320	44	4,951	1031	67,603	3	167	1	4	0	36	8.9	144
36	2–Sep	623	54,943	59	5,010	4102	71,705	18	185	4	8	0	36	9	140
36	3–Sep	901	55,844	90	5,100	1397	73,102	17	202	3	11	0	36	9.4	136
36	4–Sep	493	56,337	53	5,153	1035	74,137	24	226	63	74	0	36	9.3	131
36	5–Sep	471	56,808	44	5,197	878	75,015	18	244	58	132	0	36	9.4	131
36	6–Sep	326	57,134	35	5,232	909	75,924	18	262	27	159	0	36	9.1	136
36	7–Sep	422	57,556	33	5,265	1219	77,143	28	290	36	195	0	36	8.7	129
37	8–Sep	542	58,098	55	5,320	983	78,126	27	317	62	257	0	36	9.5	135
37	9–Sep	157	58,255	40	5,360	856	78,982	23	340	31	288	0	36	9.9	133
37	10–Sep	71	58,326	40	5,400	415	79,397	9	349	7	295	0	36	NA	129
37	11–Sep	35	58,361	19	5,419	242	79,639	3	352	9	304	0	36	NA	NA

Appendix B5.–Daily and cumulative salmon weir counts, water temperature, and stream height for Chilkoot Lake, 2003.

Stat.		Sockeye		Sockeye		Pink		Chum		Coho		Chinook		Water	Water
Week	Date	Daily	Cum.	Marked	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Temp (C)	Level(mm)
23	6–Jun	2	2	1	1	0	0	0	0	0	0	0	0	9	133
23	7–Jun	13	15	6	7	0	0	0	0	0	0	0	0	8	139
24	8–Jun	16	31	0	7	0	0	0	0	0	0	0	0	8	140
24	9–Jun	13	44	0	7	0	0	0	0	0	0	0	0	8	140
24	10–Jun	36	80	2	9	0	0	0	0	0	0	0	0	9	143
24	11–Jun	20	100	0	9	0	0	0	0	0	0	0	0	9.5	148
24	12–Jun	81	181	10	19	0	0	0	0	0	0	0	0	9.5	148
24	13–Jun	77	258	7	26	0	0	0	0	0	0	0	0	9	149
24	14–Jun	99	357	10	36	0	0	0	0	0	0	0	0	10	153
25	15–Jun	50	407	7	43	0	0	0	0	0	0	0	0	10	146
25	16–Jun	22	429	0	43	0	0	0	0	0	0	0	0	8.5	142
25	17–Jun	48	477	5	48	0	0	0	0	0	0	0	0	10	140
25	18–Jun	60	537	7	55	0	0	0	0	0	0	0	0	9.5	143
25	19–Jun	53	590	5	60	0	0	0	0	0	0	0	0	8	150
25	20–Jun	172	762	19	79	1	1	0	0	0	0	0	0	9	145
25	21–Jun	43	805	2	81	0	1	0	0	0	0	0	0	9	141
26	22–Jun	20	825	2	83	0	1	0	0	0	0	0	0	9	140
26	23–Jun	60	885	5	88	1	2	0	0	0	0	0	0	9	139
26	24–Jun	142	1,027	13	101	1	3	0	0	0	0	0	0	9	136
26	25–Jun	164	1,191	19	120	0	3	0	0	0	0	0	0	7.5	137
26	26–Jun	192	1,383	18	138	0	3	0	0	0	0	0	0	8.5	140
26	27–Jun	268	1,651	28	166	0	3	0	0	0	0	0	0	8	141
26	28–Jun	319	1,970	32	198	0	3	0	0	0	0	0	0	9	137
27	29–Jun	469	2,439	47	245	1	4	0	0	0	0	0	0	9.5	134
27	30–Jun	562	3,001	53	298	3	7	0	0	0	0	0	0	9.5	134
27	1–Jul	136	3,137	16	314	0	7	0	0	0	0	0	0	11	139
27	2–Jul	243	3,380	25	339	1	8	0	0	0	0	0	0	10	146
27	3–Jul	194	3,574	19	358	1	9	0	0	0	0	0	0	9.5	146
27	4–Jul	561	4,135	56	414	4	13	0	0	0	0	0	0	8.5	151
27	5–Jul	640	4,775	64	478	5	18	1	1	0	0	0	0	9	150
28	6–Jul	277	5,052	40	518	3	21	1	2	0	0	0	0	9.8	144
28	7–Jul	231	5,283	15	533	3	24	0	2	0	0	0	0	9.5	141
28	8–Jul	726	6,009	68	601	27	51	0	2	0	0	1	1	10	143
28	9–Jul	451	6,460	45	646	11	62	4	6	0	0	0	1	10	146
28	10–Jul	834	7,294	84	730	52	114	0	6	0	0	0	1	10	148
28	11–Jul	972	8,266	98	828	81	195	2	8	0	0	2	3	11	151
28	12–Jul	583	8,849	57	885	63	258	0	8	0	0	1	4	11	150
29	13–Jul	761	9,610	77	962	63	321	2	10	0	0	1	5	12	149
29	14–Jul	689	10,299	69	1,031	51	372	1	11	0	0	0	5	11.5	151
29	15–Jul	914	11,213	90	1,121	48	420	4	15	0	0	0	5	11	148
29	16–Jul	688	11,901	69	1,190	34	454	1	16	0	0	0	5	11.5	143
29	17–Jul	1,002	12,903	100	1,290	58	512	5	21	0	0	0	5	10	138

-continued-

Appendix B5.–Page 2 of 3.

Stat.		Sockeye		Sockeye		Pink		Chum		Coho		Chinook		Water	Water
Week	Date	Daily	Cum.	Marked	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Temp (C)	Level(mm)
29	18–Jul	1,114	14,017	111	1,401	97	609	4	25	0	0	1	6	9.5	137
29	19–Jul	2,039	16,056	202	1,603	164	773	6	31	0	0	1	7	10	139
30	20–Jul	2,808	18,864	141	1,744	280	1,053	9	40	0	0	1	8	11	143
30	21–Jul	743	19,607	100	1,844	88	1,141	22	62	0	0	0	8	9.5	152
30	22–Jul	503	20,110	90	1,934	80	1,221	18	80	0	0	0	8	10	153
30	23–Jul	801	20,911	108	2,042	142	1,363	21	101	0	0	2	10	10	144
30	24–Jul	1,725	22,636	190	2,232	184	1,547	24	125	0	0	0	10	10.5	141
30	25–Jul	1,663	24,299	200	2,432	202	1,749	17	142	0	0	1	11	10	136
30	26–Jul	3,194	27,493	171	2,603	378	2,127	25	167	0	0	0	11	10.5	134
31	27–Jul	1,237	28,730	124	2,727	162	2,289	45	212	0	0	0	11	9.5	132
31	28–Jul	3,601	32,331	186	2,913	397	2,686	30	242	0	0	0	11	9.5	132
31	29–Jul	4,234	36,565	211	3,124	580	3,266	17	259	0	0	0	11	10	131
31	30–Jul	3,700	40,265	195	3,319	304	3,570	11	270	0	0	0	11	10	134
31	31–Jul	3,896	44,161	185	3,504	577	4,147	11	281	0	0	1	12	10	133
31	1–Aug	3,062	47,223	161	3,665	1,129	5,276	22	303	0	0	0	12	11	134
31	2–Aug	1,311	48,534	139	3,804	880	6,156	13	316	0	0	0	12	10	137
32	3–Aug	1,484	50,018	156	3,960	1,051	7,207	17	333	0	0	0	12	10	140
32	4–Aug	2,001	52,019	217	4,177	903	8,110	9	342	0	0	0	12	10	137
32	5–Aug	2,137	54,156	216	4,393	1,511	9,621	6	348	0	0	0	12	10.5	138
32	6–Aug	1,968	56,124	211	4,604	2,481	12,102	2	350	0	0	0	12	10	139
32	7–Aug	1,079	57,203	108	4,712	2,714	14,816	2	352	0	0	0	12	11	140
32	8–Aug	3,876	61,079	226	4,938	3,478	18,294	0	352	0	0	0	12	11	139
32	9–Aug	1,558	62,637	157	5,095	4,513	22,807	3	355	0	0	0	12	13	140
33	10–Aug	1,084	63,721	109	5,204	3,796	26,603	3	358	0	0	0	12	13	137
33	11–Aug	1,004	64,725	100	5,304	3,131	29,734	5	363	0	0	0	12	10.5	137
33	12–Aug	1,431	66,156	146	5,450	2,157	31,891	2	365	0	0	0	12	10.5	135
33	13–Aug	1,060	67,216	121	5,571	1,664	33,555	4	369	0	0	0	12	10.5	133
33	14–Aug	794	68,010	85	5,656	548	34,103	5	374	0	0	0	12	10.5	133
33	15–Aug[a]	304	68,314	40	5,696	354	34,457	2	376	0	0	0	12	10	147
33	16–Aug[a]		68,314		5,696		34,457		376	0	0	0	12		
34	17–Aug[a]		68,314		5,696		34,457		376	0	0	0	12		
34	18–Aug	41	68,355	11	5,707	164	34,621	1	377	0	0	0	12	9.5	151
34	19–Aug	73	68,428	11	5,718	143	34,764	0	377	0	0	0	12	9.5	142
34	20–Aug	213	68,641	22	5,740	461	35,225	2	379	0	0	0	12	9	136
34	21–Aug	216	68,857	26	5,766	474	35,699	2	381	0	0	0	12	9.5	137
34	22–Aug	269	69,126	30	5,796	1,100	36,799	5	386	0	0	0	12	9	135
34	23–Aug	439	69,565	43	5,839	1,476	38,275	2	388	0	0	0	12	10	129
35	24–Aug	550	70,115	59	5,898	1,946	40,221	2	390	0	0	0	12	10	128
35	25–Aug	684	70,799	71	5,969	1,658	41,879	6	396	0	0	0	12	10	126
35	26–Aug	435	71,234	44	6,013	2,258	44,137	7	403	0	0	0	12	10	124
35	27–Aug	640	71,874	64	6,077	3,849	47,986	14	417	1	1	0	12	10	121
35	28–Aug	410	72,284	41	6,118	2,595	50,581	4	421	0	1	0	12	10	123

-continued-

Appendix B5.–Page 3 of 3.

Stat.		Sockeye		Sockeye		Pink		Chum		Coho		Chinook		Water	Water
Week	Date	Daily	Cum.	Marked	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Temp (C)	Level(mm)
35	29–Aug	542	72,826	55	6,173	1,777	52,358	6	427	0	1	0	12	10	124
35	30–Aug	303	73,129	40	6,213	1,155	53,513	8	435	0	1	0	12	10	127
36	31–Aug	234	73,363	23	6,236	267	53,780	3	438	0	1	0	12	9	136
36	1–Sep	109	73,472	15	6,251	50	53,830	2	440	0	1	0	12	9.5	133
36	2–Sep	45	73,517	5	6,256	89	53,919	0	440	1	2	0	12	10	140
36	3–Sep	79	73,596	8	6,264	184	54,103	4	444	0	2	0	12	9	149
36	4–Sep	107	73,703	10	6,274	113	54,216	11	455	0	2	0	12	9	143
36	5–Sep	112	73,815	11	6,285	134	54,350	4	459	9	11	0	12	9.4	133
36	6–Sep	216	74,031	22	6,307	561	54,911	17	476	1	12	0	12	10.8	131
37	7–Sep	185	74,216	20	6,327	244	55,155	13	489	1	13	0	12	10.6	134
37	8–Sep	142	74,358	18	6,345	134	55,289	5	494	2	15	0	12	9.5	133
37	9–Sep	101	74,459	18	6,363	135	55,424	4	498	0	15	0	12	9.2	136

[a] Flood event, weir temporarily removed.

Appendix C1.–Age composition of the Chilkoot Lake sockeye salmon escapement by sex, 1999-2003.

Age composition of sockeye salmon in the District 115-33-020 (Chilkoot Lake weir) escapement by sex, 1999. Statistical Weeks 24–38 (June 6–Sept 18)

	Brood Year and Age Class						
	1995	1994	1994	1993	1993	1992	Sample
	1.2	1.3	2.2	1.4	2.3	2.4	Size
Male	404	493	102	2	174	3	1,178
Percent	19.6	25.3	5.2	0.1	8.5	0.2	58.9
Std. Error	0.9	1	0.5	0.1	0.6	0.1	1.1
Female	181	452	62	2	157	1	855
Percent	8.2	22.4	3	0.1	7.4	<0.1	41.1
Std. Error	0.6	0.9	0.4	0.1	0.6	<0.1	1.1
All Fish	585	945	164	4	331	4	2,033
Percent	28.8	46.5	8.1	0.2	16.3	0.2	100
Std. Error	0.9	1.1	0.6	0.1	0.8	0.1	

Age composition of sockeye salmon in the District 115-33-020 (Chilkoot Lake weir) escapement by sex, 2000 Statistical Weeks 24–38 (June 4–Sept 16)

	Brood Year and Age Class							
	1997	1996	1995	1995	1994	1994	1993	Sample
	0.2	1.2	1.3	2.2	1.4	2.3	2.4	Size
Male	1	253	577	36	1	271	1	1,140
Percent	0	11.4	25.9	1.6	0	12.2	0	51.2
Std. Error	0	0.6	0.9	0.3	0	0.7	0	1
Female		42	728	6	1	310		1,087
Percent		1.9	32.7	0.3	0	13.9		48.8
Std. Error		0.3	0.9	0.1	0	0.7		1
All Fish	1	295	1,306	42	2	581	1	2,228
Percent	0	13.2	58.6	1.9	0.1	26.1	0	100
Std. Error	0	0.7	1	0.3	0.1	0.9	0	

-continued-

Age composition of sockeye salmon in the District 115-33-020 (Chilkoot Lake weir) escapement by sex, 2001. Statistical Weeks 23–37 (June 3–Sept 15)

	Brood Year and Age Class						
	1997	**1997**	**1996**	**1996**	**1995**	**1995**	**Sample**
	0.3	**1.2**	**1.3**	**2.2**	**1.4**	**2.3**	**Size**
Male	3	71	990		1	44	1,109
Percent	0.1	3.1	42.6		0	1.9	47.7
Std. Error	0.1	0.3	1		0	0.3	1
Female	4	41	1,097	4		70	1,216
Percent	0.2	1.8	47.2	0.2		3	52.3
Std. Error	0.1	0.3	1	0.1		0.3	1
All Fish	7	113	2,106	4	1	114	2,345
Percent	0.3	4.8	89.8	0.2	0	4.9	100
Std. Error	0.1	0.4	0.6	0.1	0	0.4	

Age composition of sockeye salmon in the District 115-33-020 (Chilkoot Lake weir) escapement by sex, 2002. Statistical Weeks 23–37 (June 2–Sept. 14)

	Brood Year and Age Class					
	1998	**1997**	**1997**	**1996**	**1996**	**Sample**
	1.2	**1.3**	**2.2**	**1.4**	**2.3**	**Size**
Male	142	1,201	19	10	32	1,404
Percent	5	42.4	0.7	0.4	1.1	49.5
Std. Error	0.4	0.9	0.1	0.1	0.2	0.9
Female	40	1,338	11	3	39	1,431
Percent	1.4	47.2	0.4	0.1	1.4	50.5
Std. Error	0.2	0.9	0.1	0.1	0.2	0.9
All Fish	182	2,540	30	13	71	2,836
Percent	6.4	89.6	1.1	0.5	2.5	100
Std. Error	0.4	0.5	0.2	0.1	0.3	

-continued-

Appendix C1.–Page 3 of 3.

Age composition of sockeye salmon in the District 115-33-020 (Chilkoot Lake weir) escapement by sex, 2003. Statistical Weeks 23–37 (June 1–Sept. 13)

	Brood Year and Age Class						
	1999	**1998**	**1998**	**1997**	**1997**	**1996**	**Sample**
	1.2	**1.3**	**2.2**	**1.4**	**2.3**	**2.4**	**Size**
Male	673	551	65	8	118		1,415
Percent	26.1	21.4	2.5	0.3	4.6		54.9
Std. Error	0.8	0.8	0.3	0.1	0.4		0.9
Female	383	616	44	2	118	1	1,164
Percent	14.9	23.9	1.7	0.1	4.6	0	45.1
Std. Error	0.7	0.8	0.2	0.1	0.4	0	0.9
All Fish	1,078	1,174	110	10	238	1	2,611
Percent	41.3	45	4.2	0.4	9.1	0	100
Std. Error	0.9	0.9	0.4	0.1	0.5	0	

Appendix D1.–Length-at-age composition of Chilkoot River sockeye salmon by sex, 1999–2003.

Length-at-age composition of Chilkoot River sockeye salmon by sex, 1999.
Statistical Weeks 24–38 (June 6–Sept 18)

	Brood Year and Age Class						
	1995	**1994**	**1994**	**1993**	**1993**	**1992**	**Sample**
	1.2	**1.3**	**2.2**	**1.4**	**2.3**	**2.4**	**Total**
Male	403	493	101	2	174	3	1,176
Avg. Length	489	587	512	579	585	613	548
Std. Error	2.1	1.1	4.1	26.5	2.1	1.7	1.7
Female	181	452	62	2	156	1	854
Avg. Length	504	569	512	580	568	580	552
Std. Error	2.3	1.2	4.1	10	1.9		1.4
All Fish	584	945	163	4	330	4	2,030
Avg. Length	491	578	512	579	574	605	549
Std. Error	1.6	0.9	3	11.6	1.5	8.4	1.1

Length-at-age composition of Chilkoot River sockeye salmon by sex, 2000.
Statistical Weeks 24–38 (June 4–Sept 16)

	Brood Year and Age Class							
	1997	**1996**	**1995**	**1995**	**1994**	**1994**	**1993**	**Sample**
	0.2	**1.2**	**1.3**	**2.2**	**1.4**	**2.3**	**2.4**	**Total**
Male	1	250	571	36	1	271	1	1,131
Avg. Length	485	506	589	501	555	591	425	568
Std. Error		2.7	1.1	9.2		1.6		1.5
Female		42	723	6	1	308		1,080
Avg. Length		522	578	533	610	578		576
Std. Error		4	0.8	8.7		1.3		0.7
All Fish	1	292	1,294	42	2	579	1	2,211
Avg. Length	485	508	583	505	583	584	425	572
Std. Error		2.4	0.7	8.2	27.5	1		0.8

-continued-

Length-at-age composition of Chilkoot River sockeye salmon by sex, 2001.
Statistical Weeks 23–37 (June 3–Sept. 15)

	Brood Year and Age Class						
	1997	**1997**	**1996**	**1996**	**1995**	**1995**	**Sample**
	0.3	**1.2**	**1.3**	**2.2**	**1.4**	**2.3**	**Total**
Male	3	71	990		1	44	1,109
Avg. Length	573	487	588		560	586	582
Std. Error	21.9	4.7	0.8			4.1	1.1
Female	4	41	1,097	4		70	1,216
Avg. Length	554	508	576	528		566	573
Std. Error	15	5.2	0.6	24.4		2.7	0.7
All Fish	7	113	2,105	4	1	114	2,344
Avg. Length	562	495	582	528	560	574	577
Std. Error	12.1	3.6	0.5	24.4		2.5	0.6

Length-at-age composition of Chilkoot River sockeye salmon by sex, 2002.
Statistical Weeks 23–37 (June 2–Sept. 14)

	Brood Year and Age Class					
	1998	**1997**	**1997**	**1996**	**1996**	**Sample**
	1.2	**1.3**	**2.2**	**1.4**	**2.3**	**Total**
Male	142	1,200	19	10	32	1,403
Avg. Length	475	592	474	618	596	579
Std. Error	3.5	0.8	7.4	12	5	1.3
Female	40	1,337	11	3	39	1,430
Avg. Length	496	577	498	609	566	574
Std. Error	4.4	0.6	13.8	17.3	4.6	0.7
All Fish	182	2,538	30	13	71	2,834
Avg. Length	480	584	483	616	579	576
Std. Error	3	0.5	7.1	9.8	3.8	0.7

-continued-

Appendix D1.–Page 3 of 3.

Length-at-age composition of Chilkoot River sockeye salmon by sex, 2003.
Statistical Weeks 23–37 (June 1–Sept. 13)

	Brood Year and Age Class						
	1999	**1998**	**1998**	**1997**	**1997**	**1996**	**Sample**
	1.2	**1.3**	**2.2**	**1.4**	**2.3**	**2.4**	**Total**
Male	672	550	65	8	116		1,411
Avg. Length	490	586	489	602	585		536
Std. Error	1.4	1.1	4.6	9.6	2.4		1.5
Female	383	615	44	2	118	1	1,163
Avg. Length	503	570	508	543	572	574	546
Std. Error	1.3	0.9	3.5	27.5	1.9		1.2
All Fish	1,076	1,172	110	10	236	1	2,605
Avg. Length	495	578	496	590	578	574	540
Std. Error	1	0.7	3.2	11.7	1.6		1