**Fishery Data Series No. 10-23**

# Stock Assessment Studies of Chilkat River Adult Sockeye and Chum Salmon Stocks in 2003 and 2004

**by**

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

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**Weights and measures (metric)**

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

**Weights and measures (English)**

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

**Time and temperature**

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

**Physics and chemistry**

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

**General**

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

**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, $\chi^2$, 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 REPORT NO. 10-23*

# STOCK ASSESSMENT STUDIES OF CHILKAT RIVER ADULT SOCKEYE AND CHUM SALMON STOCKS IN 2003 AND 2004

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# ABSTRACT

The Alaska Department of Fish and Game and the Northern Southeastern Regional Aquaculture Association conducted mark-recapture studies of adult Chilkat River sockeye (*Oncorhynchus nerka)* and chum (*O. keta*) salmon in 2003 and 2004, in order to estimate the escapement of chum and sockeye salmon in the Chilkat River, and sockeye salmon in Chilkat Lake, and to summarize age, sex, and length compositions for these populations. Using two fish wheels in the lower Chilkat River, we captured and marked sockeye and chum salmon with an individually numbered tag and with 2 fin clips. The 2003 total fish wheel catch was 4,551 sockeye salmon and 3,846 chum salmon. Of these, 4,012 sockeye salmon and 3,042 chum salmon were marked. The drainagewide sockeye salmon abundance estimate, at the time of tagging, was 150,000 fish (SE=11,000). We then stratified the sockeye escapement into Chilkat Lake and Chilkat River mainstem sockeye escapements, which were calculated as 113,000 and 36,000 sockeye salmon, respectively. The 2003 drainagewide chum salmon abundance estimate, at the time of tagging, was 166,000 fish. The 2004 total fish wheel catch was 4,366 sockeye salmon and 4,266 chum salmon. Of these, we marked 4,021 sockeye and 4,249 chum salmon. The drainagewide sockeye salmon abundance estimate was 163,000 fish; the Chilkat Lake and Chilkat River mainstem sockeye escapements were 115,000 and 45,000 fish, respectively. The 2004 drainagewide chum salmon abundance estimate was 329,000 fish.



Key words: mark-recapture, stratified population estimate, escapement, scale pattern analysis, Chilkat River, Chilkat Lake, salmon, fish wheel, age, length, sockeye salmon, *Oncorhynchus nerka*, chum salmon, *Oncorhynchus keta*, Southeast Alaska


# INTRODUCTION

The Chilkat River drainage is located at the head of Lynn Canal, in northern southeast Alaska (Figure 1). The drainage supports large runs of sockeye (*Oncorhynchus nerka*) and chum (*O. keta*) salmon populations that contribute significantly to commercial and subsistence fisheries in the Haines area (ADF&G 1987, Bachman et al. 1999). The northern and western parts of the basin lie within British Columbia and Yukon Territory, Canada. The Chilkat River is a large glacial system that has its terminus near Haines, Alaska. The mainstem and major tributaries (Tsirku, Klehini, Kelsall, and Tahini rivers) comprise approximately 350 km of river channel, in a watershed covering about 1,600 $km^2$. The river system originates from many glaciers and flows through rugged mountainous terrain, converging to a turbid, braided river system. Salmon escapements cannot be monitored by aerial or foot surveys in the turbid areas of the river. Chilkat Lake, the primary destination of Chilkat River sockeye salmon, is a relatively large, clear water lake with a surface area of 9.8 $km^2$, mean depth of 32.5 m, a maximum depth of 57 m, and a volume of 0.319 $km^3$. The outlet of the lake is located approximately 30 km northwest of the city of Haines, Alaska (Figure 1).

Based on mark-recapture studies, statistics from the gillnet fishery, and fish wheel collected scale pattern analysis data (in Marshall et al. 1982), it was estimated that 80 to 90% of Chilkat sockeye salmon originated from Chilkat Lake, with the remainder of the fish produced in the Chilkat River mainstem and its tributaries (Bachman 2005, Kelley and Bachman 2000). Important mainstem sockeye salmon spawning locations include Mule meadows, Mosquito Lake, Little Salmon River, and Bear flats. Chilkat River drainage fall chum salmon populations originate from the Klehini River (early run) and Chilkat River mainly along the Tsirku River delta near the village of Klukwan (late run).

These large runs of sockeye and chum salmon contribute significantly to the Lynn Canal (District 15; Figure 2) commercial drift gillnet fishery as well a subsistence fishery in the Haines area (Bachman et al. 1999). Chilkat Lake has produced annual commercial sockeye salmon harvests as high as 168,000 in 1986, with an average harvest of 92,000 fish for the years 1976 to 2004. Annual harvests of "other" sockeye stocks, which include Chilkat River mainstem spawning fish, have

been as high as 33,000 (1992), with an average harvest of 14,400 fish between 1976 and 2004. In addition to the commercial harvest, sockeye salmon originating from Chilkat Lake and the Chilkat River are also taken in the Haines area subsistence fishery. Reported subsistence harvests in Chilkat Inlet and Chilkat River for the period 1990 to 2004 averaged approximately 6,700 sockeye salmon. District 15 commercial drift gillnet catches of fall chum salmon averaged 304,000 fish in the 1980s, including a maximum harvest of 621,000 fish in 1985. Commercial harvests of chum salmon declined in the 1990s and averaged 58,600 fish from 1995 to 2004. As a result, the fall commercial gillnet fishery has been curtailed since 1989 to reduce harvest of this stock. Prior to 1990, the majority of the chum salmon harvested in the Lynn Canal drift gillnet fishery were wild fall chum salmon (Figure 3). Hatchery releases of summer chum salmon in lower Lynn Canal now contribute over 80% of the chum harvest in the district. The majority of the commercial sockeye salmon harvest in the Lynn Canal fishery is comprised of a mixture of stocks from Chilkat Lake, Chilkat River, Chilkoot Lake, and Berners Bay rivers. Scale pattern analysis (SPA) is used inseason to estimate the contribution of these stocks of sockeye salmon in this fishery each season (Marshall et al. 1982; McPherson et al. 1983, 1992; McPherson 1990, McPherson and Marshall 1986; McPherson 1987, 1989; McPherson and Olsen 1992). Scale samples from Chilkat Lake and mainstem Chilkat River sockeye salmon stocks are collected by this project for use as SPA standards.

The Chilkat River fish wheel program was operated experimentally by the Alaska Department of Fish and Game (ADF&G) in 1977, 1978, 1982, 1983, and again in 1990, to assess Chilkat River fall chum and coho (*O. kisutch*) salmon escapements into the river. Beginning in 1991, the fish wheel was also used to assess Chinook salmon (*O. tshawytscha*) escapements (Ericksen 2003*a*). The Chilkat River fish wheel program has been operated to sample all species of Pacific salmon into the river since 1997 (Table 1). Our goal with this study was to estimate the escapement of sockeye and chum salmon escapement returning to the Chilkat River drainage during 2003 and 2004. This report describes the methods and results of this study.

# OBJECTIVES

1. Estimate the escapement of adult sockeye salmon into Chilkat Lake and to the Chilkat River mainstem in 2003 and 2004
2. Estimate the age, sex, and length composition of adult sockeye salmon entering the Chilkat River in 2003 and 2004
3. Estimate the escapement of adult chum salmon to the Chilkat River in 2003 and 2004.
4. Estimate the age, sex, and length composition of adult chum salmon entering the Chilkat River in 2003 and 2004
5. Develop a relationship between fish wheel catch, visual aerial survey counts and mark-recapture escapement estimates of Chilkat River adult chum salmon

# METHODS

## ABUNDANCE ESTIMATES

### Lower River Adult Sampling and Marking (First Event)

Returning adult sockeye and chum salmon were captured in fish wheels operated adjacent to milepost 9 of the Haines highway, on the eastern bank of the Chilkat River where the main

channel is next to the road (Figure 2). Commercial Fisheries Division personnel installed 2 aluminum fish wheels, which had a 3-basket configuration, in early June. One fish wheel was located adjacent to milepost 9, and the other was placed approximately 300 m downstream of the first. While the Chilkat River channel at this location is conducive for fish wheel operation, seasonal fluctuations in water flow velocity required minor changes in fishing location to maintain optimal rpm rate for the fish wheels. Except for infrequent periods of high-flow events, routine maintenance, or equipment failure, the fish wheels were operated continuously from June 6 through October 21 in 2003, and from June 7 through October 19 in 2004. The number of hours each wheel operated was recorded daily. Water depth (cm) and temperature (°C) were recorded each morning near milepost 8 of the Haines highway.

### *Sockeye Salmon*

All sockeye salmon were dip-netted from the fish wheel live boxes and placed into a tagging/marking trough partially filled with river water. Every healthy and active sockeye salmon was visually examined for sex, and measured to the nearest millimeter from mideye-to-fork-of-tail (MEF). All salmon that had serious wounds or that were lethargic in behavior were immediately released and were not marked, tagged, or sampled. Each day, a scale sample was collected from the first 40 sockeye salmon for age determination. All uninjured sockeye salmon > 360 mm MEF were marked by inserting a uniquely numbered T-bar tag just below the dorsal fin, and by removing the adipose fin and a secondary fin; the type of secondary fin removed was based on a marking schedule, and on statistical weeks for the year (Table 2 and Appendix A). The marking schedule corresponded to 2-week blocks of time throughout the season, which allowed us to stratify the marking and recapture data. We did not include sockeye salmon ≤ 360 mm MEF (precocious males or jacks) in the mark-recapture analysis, because fish in this size category do not have equal probability of capture in recovery events at Chilkat Lake.

### *Chum Salmon*

Procedures for sampling chum salmon were similar to that previously discussed for sockeye salmon. Every healthy chum salmon was visually examined for sex, and measured to the nearest mm MEF. A scale sample was collected from every healthy chum salmon captured in the fish wheels for age composition analysis. Every healthy chum salmon captured was marked with a uniquely numbered solid-core spaghetti tag sewn into the posterior end of the dorsal fin through the pterygiophores. The fish was also given a lower left operculum hole punch, and had a fin removed. The type of secondary fin removed was based on a sampling schedule (Table 3). The marking schedule corresponded to 2-week blocks of time throughout the season, which allowed us to stratify the marking and recapture data.

### *Data Collection*

The date of sampling, the tag sequence number used, data on sex and length, as well as information connecting the data to a scale sample, were recorded on OPSCAN ASL forms, according to established protocols (ADF&G 1994). The tagging and sampling procedures took from 30 to 40 seconds per fish to complete. The fish were then immediately returned to the river. Fish wheel catches were sampled in the morning (0800–1200 hrs) and late afternoon (1430–1630 hrs), with more frequent sampling conducted during periods of peak fish movement.

## Recovering Tags (Recapture or Second Event)

### *Sockeye Salmon*

In 2003, staff from the Northern Southeast Regional Aquaculture Association (NSRAA) operated the Chilkat Lake weir, from June 26 through October 17. In 2004, ADF&G staff operated the weir, from July 6 through October 13 (Bachman 2005). Fish were captured as they swam through the weir into a fish trap. In addition, beach seines were used to capture adult sockeye salmon milling and holding immediately behind the weir. All sockeye salmon were examined for missing adipose fins, T-bar tags and secondary marks. Double sampling was prevented by punching a hole in the lower edge of the left operculum of all fish sampled during recovery efforts. Approximately 40 fish each day were sampled for length (MEF in mm), sex and scales.

ADF&G staff sampled Chilkat River mainstem sockeye salmon in 2 large spawning tributaries. Sampling efforts were concentrated in known spawning areas in Mosquito Lake, Bear Flats, Little Salmon River and at Mule Meadows (a small tributary just north of the Kelsall River confluence; Figure 2). Chilkat River mainstem sockeye salmon were captured with gillnets, beach seines and bare hands once or twice each week, from July 6 through September 6 in 2003 and from July 24 through September 25 during 2004. Fish were examined and sampled in the same manner as described for Chilkat Lake. Scheduling of recovery sampling efforts at mainstem areas varied based on the percentage of recaptures in a given area to avoid unnecessary handling of fish on the spawning grounds.

### *Chum Salmon*

Two teams of 3 people each sampled chum salmon for marks in 2 spawning areas. The sampling sites were classified into 2 distinct areas based upon a similar study conducted in 1990 (Figure 2; ADF&G unpublished data). The Klehini River (including Herman Creek) area was sampled from September 12 to October 11 in 2003, and from August 25 to October 9 during 2004. The lower Chilkat River area was sampled from September 5 to November 8 in 2003, and from September 19 to November 2 during 2004. All chum salmon were examined for marks and missing adipose fins, measured for length (MEF in mm), and sexed. Double sampling was prevented by punching a hole in the lower edge of the left operculum of all sampled fish during recovery efforts. In addition, chum salmon caught incidentally were sampled by ADF&G Division of Sport Fish personnel in their coho salmon recovery efforts, and by NSRAA personnel while collecting chum salmon brood stock at Herman Creek and Chilkat River spawning grounds near the village of Klukwan.

### *Data Collection*

Mark recovery data were organized into strata by statistical week for analysis. Statistical weeks begin at 00:01 a.m. Sunday and end the following Saturday at midnight, with weeks numbered sequentially beginning with the week encompassing the first Saturday in January (Appendices A1 and A2).

## Inriver Abundance (Data Analysis)

### *Sockeye Salmon*

A two-event mark-recapture experiment was used to develop separate estimates of the spawning escapement of sockeye salmon to Chilkat Lake and the Chilkat River mainstem in 2003 and

2004. The number of adult sockeye salmon marked at the fish wheels defined the first sampling event. Sampling of adult sockeye salmon on mainstem spawning grounds and at the Chilkat Lake weir defined the second event. Mark-recapture data were compiled into a matrix divided into mark and recapture time strata, and an estimate of abundance was calculated for sockeye salmon for the entire Chilkat River drainage. The weekly estimates of Chilkat River mainstem and Chilkat Lake sockeye salmon were then determined by multiplying an estimate of the weekly abundance by the proportion of mainstem and Chilkat Lake fish as determined from scale samples.

Sockeye salmon scale samples collected from the fish wheels were analyzed for stock of origin by Commercial Fisheries Division personnel at the ADF&G scale lab in Douglas, Alaska. Scales were projected onto a microfiche reader and aged. Each scale was then assigned to one of the 2 Chilkat River stocks (Chilkat Lake or Chilkat River mainstem) based on scale pattern characteristic analysis (SPA) (McPherson 1989). The proportions of each stock in the fish wheel catch were calculated for each week to provide compositions of each stock group based on fish wheel catch.

Sockeye salmon abundance was estimated using Chapman's modified Petersen estimator for a closed population, with corresponding variance (Seber 1982), as follows:

$$\hat{N}_{es} = \frac{(n_1+1)(n_2+1)}{(m_2+1)} - 1 \text{ ; and,} \tag{1a}$$

$$var\left[\hat{N}_{es}\right] = \frac{(n_1+1)(n_2+1)(n_1-m_2)(n_2-m_2)}{(m_2+1)^2(m_2+2)} \text{ ; where,} \tag{1b}$$

$N_{es}$ denotes the number of sockeye salmon in the escapement, $\hat{N}_{es}$ denotes the estimate of $N_{es}$; $n_1$ is the number of sockeye salmon marked in the lower Chilkat River fish wheels (first event); $n_2$ is the number of sockeye salmon captured and examined for marks in the recapture or second-event sampling; and $m_2$ is the subset of $n_2$, which are the number of fish in the second event that had been marked in the first event at the fish wheels.

The general assumptions that must hold for a 2-sample mark-recapture estimate to be consistent were listed by Seber (1982):

(a) every fish has an equal probability of being marked during event 1, every fish has an equal probability of being captured in event 2, or marked fish mix completely with unmarked fish;

(b) the population is closed (no recruitment, death, or emigration), so that the population size is constant;

(c) marking does not affect catchability (or mortality) of the fish;

(d) fish do not lose marks between sample events; and,

(e) all recovered marks are reported.

If assumptions of the Petersen model were not met, a model based on Chapman and Junge (1956) or Darroch (1961) was used to form the population estimate, by stratifying the population by sex, age or time of marking or recapture area.

The assumption (b) that the population was closed was true for Chilkat salmon populations in a narrow sense. Each sampling day was a snapshot of the sockeye and chum salmon populations as they moved past the fish wheels. In this situation, the population's location in time would function as if it were a location in space; a salmon population passing the fish wheels in a time stratum could be considered a closed population. If marked and unmarked fish had the same probability of leaving the population prior to the second event (sampling on the spawning grounds), if we were able to distinguish when marked fish were tagged, and if assumptions about equal catchability, tag retention, and mark recognition were met, a closed population estimator would produce a valid estimate of the salmon populations at the time the population passed the fish wheels (see Schwarz and Taylor 1998).

Marking and recovery data were organized into temporal strata and a drainagewide sockeye salmon abundance estimate was determined for the time of marking. Estimates of weekly abundance by stock group were determined by multiplying the proportion of the weekly fish wheel sockeye salmon catch per unit of effort (CPUE) for each weekly period by the total abundance estimate. Fish wheel CPUE was calculated as the number of fish caught per basket hour.

Methods for estimating the abundance of Chilkat River fall chum salmon were identical to that of sockeye salmon. Unlike sockeye salmon, age (scale) samples were not collected from second-event sampling on the spawning grounds. Length, sex, and presence of a tag or mark on each fish were noted. The number of adult chum salmon marked at the fish wheels defined the first sampling event. Sampling adult chum salmon on the spawning grounds defined the second event. Mark-recapture data were compiled into a matrix divided into mark and recapture time strata, and an estimate of abundance was generated for chum salmon for the entire Chilkat River drainage. Chum salmon abundance was estimated using the Chapman's modified Petersen estimator for a closed population.

We chose to pool marking and recovery strata if we could not detect failure of assumption (a) using criteria outlined by Arnason et al. (1996). To test for consistency of capture probabilities in the marking and recapture strata, two chi-square tests are commonly used. A test for equal capture probability in the first sample compares observed and expected numbers of marked and unmarked fish in each recapture stratum. A test for equal capture probability in the second sample, or equivalently, complete mixing, compares observed and expected numbers of those fish marked in the initial (marking) strata which were recaptured or not recaptured. These tests are provided in the Stratified Population Analysis System[1] (SPAS) software that were used to analyze mark-recapture data and are labeled "equal proportions" and "complete mixing," respectively (Arnason et al. 1996). We considered a test statistic with $p$-value $\leq 0.05$ to be "significant." If neither test statistic, or only one test statistic, was significant, we concluded all marking and all recapture strata could be pooled without significant risk of bias and the simple Petersen ("pooled Petersen") estimator could be used. We also used a Kolmogorov-Smirnov (*K-S*) 2-sample test (Conover 1999) to detect if fish of different sizes were captured with equal probability. This test compared the cumulative size distributions of marked fish in the first event with those examined for marks in the second event. If size selective sampling was detected, the abundance estimate was stratified by size.

[1] Product names used in this publication are included for completeness but do not constitute product endorsement.

## AGE, SEX AND LENGTH COMPOSITIONS

Length, sex and scale data from adult sockeye salmon were collected at the fish wheels, Chilkat Lake weir site, and on spawning grounds of the Chilkat River mainstem following methods stated in ADF&G (1994). Length, sex and scale data were collected from every chum salmon caught in the fish wheels. Only length and sex data were collected from chum salmon examined on spawning grounds on the Klehini River and the Chilkat River. Sex and length compositions were tabulated separately for fish captured in the fish wheels and in each second-event sampling area. Scale samples were taken from the preferred area of each fish (INPFC 1963) and prepared for analysis as described by Clutter and Whitesel (1956). Age classes were designated following the European aging system where freshwater and saltwater years are separated by a period (e.g., 1.3 denotes a 5-year-old fish with 1 year in freshwater and 3 years in saltwater).

Mean length-at-age and their variances were calculated using standard sample summary statistics (Cochran 1977). Size and sex selectivity was investigated by comparing the numbers of sockeye and chum salmon by size and sex captured in the lower river and spawning ground samples with contingency table analysis ($\alpha = 0.10$). Age or sex composition of the escapement was obtained from pooled samples when no selectivity was found. Proportions in the age or sex compositions and their associated variances were estimated as:

$$\hat{p}_a = \frac{n_a}{n}; \tag{2a}$$

$$var\left[\hat{p}_a\right] = \frac{\hat{p}_a(1-\hat{p}_a)}{n-1}, \text{ where} \tag{2b}$$

$\hat{p}_a$ denotes the estimated proportion of fish of age $a$ or sex $a$ within the population, $n$ is the total number of samples (age or sex) and $n_a$ is the subset of $n$ determined to be age or sex $a$. The abundance of sex $s$ sockeye and chum salmon in the escapement was estimated as follows:

$$\hat{N}_s = \hat{N}\hat{p}_s; \tag{3a}$$

$$\text{var}\left[\hat{N}_s\right] = \text{var}\left[p_s\right]\hat{N}^2 + \text{var}\left[\hat{N}\right]p_s^{\,2} - \text{var}\left[p_s\right]\text{var}\left[\hat{N}\right], \tag{3b}$$

where $\hat{N}$ is the estimated inriver abundance of sockeye or chum salmon. The abundance of age $a$ sockeye or chum salmon in the escapement $\hat{N}_a$ was estimated by substituting $\hat{N}_s$ and $\hat{p}_s$ for $\hat{N}_a$ and $\hat{p}_a$ in equations 3a and 3b.

Marking and recovery data were organized by temporal strata and a drainagewide sockeye salmon abundance estimate was determined for the time of marking. The estimate was derived for all mark and recovery data combined. Sockeye salmon that were ≤ to 360 mm MEF were not included in this estimate, because fish in this size category are not equally sampled in recovery events at Chilkat Lake (Bachman and McGregor 2001).

# RESULTS

## ABUNDANCE ESTIMATES

### Lower River Adult Sampling and Marking (First Event)

#### *2003*

In 2003, fish wheels were operated on the Chilkat River from June 6 through October 21 (Table 1). Due to woody debris entanglements that caused damage to the upper fish wheel axle, this wheel was inoperable from July 26 through July 29. From October 19 through the end of the season, the lower fish wheel became inoperable because water levels were below that necessary to operate the fish wheels. Fish wheel effort (hours of operation per day), rpm, and physical river parameters are summarized in Appendices B1 through B3. In 2003, the daily water level was generally lower than the 1994 to 2002 average throughout the sampling season (Figure 4).

#### *2004*

In 2004, fish wheels were operated on the Chilkat River from June 7 through October 19 (Table 4). Due to high water events caused by stormy weather, the lower wheel was inoperable from August 8 through August 10. Fish wheel effort (hours of operation per day), rpm, and physical river parameters are summarized in Appendices B4 through B6. In 2004, the daily water level was generally lower than the 1994 to 2003 average throughout the sampling season (Figure 5).

### Inriver Abundance

#### *2003 Sockeye Salmon*

A total of 4,012 sockeye salmon were marked and released out of 4,551 fish captured in the lower Chilkat River fish wheels (Table 5, Appendices B7 through B9); 233 sockeye salmon were ≤ 360 mm (MEF) length and were released without marks. Also, 75 fish escaped without being marked, 30 were found dead, and 201 were thought to be injured and were released without being sampled.

In 2003, NSRAA personnel operated the Chilkat Lake weir. NSRAA personnel examined 5,948 sockeye salmon for marks at the Chilkat Lake weir site and recovered 124 marked fish. ADF&G staff captured 1,444 sockeye salmon on mainstem area spawning grounds and recovered 68 marked fish for a total of 192 marked fish recovered drainage wide (Table 6).

The cumulative distribution function (CDF) of lengths of sockeye salmon marked in the lower Chilkat River was not significantly different from the CDF of marked sockeye salmon recaptured at Chilkat Lake and Chilkat River mainstem spawning grounds (*K-S* test, $d_{max}$.= 0.071, $P = 0.31$; Figure 6, top). Sockeye salmon marked in the lower Chilkat River were significantly smaller; however, than all of the fish (marked and unmarked combined) sampled on the spawning grounds (*K-S* test, $d_{max} = 0.104$, $P < 0.05$; Figure 6, bottom). We concluded that sampling in the second event was size selective, relative to the first-event sample. Therefore, the population was stratified into 2 size classes, to reduce bias: small fish (≤ 520 mm MEF) and large fish (>520 mm MEF). The resulting CDFs of lengths of marked fish were not significantly different from CDFs of those recaptured at Chilkat Lake weir or Chilkat River mainstem spawning grounds for small fish (*K-S* test, $d_{max} = 0.207$, $P = 0.051$; Figure 7, top), and large fish (*K-S* test, $d_{max} = 0.111$, $P = 0.081$; Figure 7, bottom). Second-event sampling was not uniform over time, as recovery rates were greater for large fish marked later in the immigration (Table 7). Large fish marked during 3

marking periods (June 9–July 12, July 14–August 24, and August 25–October 19) were recaptured at significantly different rates ($X^2$ = 6.85, $df$ = 2, $P$ = 0.033). In addition, the probability of capturing a large marked sockeye salmon differed significantly among the 2 recovery areas ($X^2$ = 33.3, $df$ = 1, $P$ < 0.001). Therefore, the Darroch estimator was used to estimate abundance.

Partial pooling of the original strata was necessary, because negative probabilities of capture and stratum estimates were obtained when we applied the Darroch model to the original 9 marking strata and 15 recovery strata. The data for small and large sockeye salmon were pooled into 3 temporal marking strata and 2 recovery areas (Table 8). An estimated 150,000 sockeye salmon immigrated into the Chilkat River drainage in 2003 (Table 9). Of those, 41,000 were small, and 109,000 were large fish. The estimates are germane to the time of marking in the lower river, because subsistence harvests and natural predation occurred between the 2 sampling events.

Scale samples collected from sockeye salmon marked at the fish wheels were assigned to stock of origin through scale pattern analysis, and weekly proportions by stock of the fish wheel catch were developed from the results. The total abundance estimate was multiplied by the weekly stock proportions, to generate the estimated weekly passage of sockeye salmon by stock group through the lower Chilkat River. The estimated abundance of Chilkat Lake sockeye salmon was 113,000 fish (Tables 10 and 11). The estimated abundance of Chilkat River mainstem fish was 36,000 fish (Tables 10 and 12).

### *2004 Sockeye Salmon*

Of 4,366 sockeye salmon captured in the lower Chilkat River fish wheels, 4,021 were marked prior to release (Table 13; Appendices B10 through B12), and 115 were ≤ 360 mm (MEF) length and were released without marks. A total of 88 fish escaped without being marked, 15 were found dead, and 127 fish were thought to be injured and were released without being sampled.

In 2004, ADF&G staff operated the Chilkat Lake weir to provide second-event sampling of Chilkat Lake sockeye salmon. The Chilkat Lake weir was installed in early June; sampling began on July 6 and continued through October 13, 2004 (Appendices B13 and B14). A total of 9,420 fish were examined while enumerating sockeye salmon through the Chilkat Lake weir; 221 tagged fish were recovered. In addition, we examined 1,651 fish on spawning grounds in the Chilkat River drainage for marks, and recovered 49 total marked fish (Table 14).

The cumulative distribution function (CDF) of lengths of sockeye salmon marked in the lower Chilkat River was significantly different from the CDF of marked sockeye salmon recaptured at Chilkat Lake and Chilkat River mainstem spawning grounds (*K-S* test, $d_{max}$ = 0.089, $P$ = 0.041; Figure 8, top). In addition, sockeye salmon marked in the lower Chilkat River were significantly smaller than all fish (marked and unmarked combined) sampled on the spawning grounds (*K-S* test, $d_{max}$.= 0.187, $P$ < 0.001; Figure 8, bottom). We concluded that sampling in the second event was size selective, relative to the first-event sample. The population was stratified into 2 size classes, to reduce this size bias of both events: small fish (≤ 515 mm MEF), and large fish (>515 mm MEF). The resulting CDFs of lengths of marked fish were not significantly different from CDFs of those recaptured at Chilkat Lake weir or Chilkat River mainstem spawning grounds for small fish (*K-S* test, $d_{max}$ = 0.148, $P$ = 0.209; Figure 9, top) and large fish (*K-S* test, $d_{max}$ = 0.111, $P$ = 0.092; Figure 9, bottom). Second-event sampling was uniform over time, as recovery rates were greater for large fish marked later in the immigration (Table 15). Large fish marked during 3 marking periods (June 8–July 10, July 11–August 21, and August 22–October 12) were

recaptured at similar rates ($X^2$ = 5.53, $df$ = 2, $P$ = 0.063). The probability of capturing a large marked sockeye salmon was not significantly different among the 2 recovery areas ($X^2$ = 0.29, $df$ = 1, $P$ = 0.588). Therefore, we used the pooled-Petersen estimator to estimate population abundance.

The data for small and large sockeye salmon were pooled into 3 temporal marking strata and 2 recovery areas (Table 16). An estimated 163,000 sockeye salmon immigrated to the Chilkat River drainage in 2004 (Table 17). Of those, 32,000 were small fish and 131,000 were large fish. The estimates are germane to the time of marking in the lower river, because subsistence harvests and natural predation occur between the 2 sampling events.

Scale samples collected from sockeye salmon marked at the fish wheels were assigned to stock of origin through scale pattern analysis and weekly proportions by stock of the fish wheel catch were developed. The total abundance estimate was then multiplied by the weekly stock proportions to generate the estimated weekly passage of sockeye salmon by stock group through the lower Chilkat River. The estimated abundance of Chilkat Lake sockeye salmon was 115,000 fish. The estimated abundance of Chilkat River mainstem fish was 45,000 fish (Table 18).

### *2003 Chum Salmon*

Of the total fish wheel catch of 3,846 chum salmon, 3,402 fish were tagged and fin clipped (Table 19), 120 escaped without being marked, and 33 were found dead. An additional 291 fish were intentionally released without marks when large fish wheel catches of both chum and coho salmon resulted in severe overcrowding in the holding boxes.

We examined 4,528 chum salmon on the spawning grounds for marks (Table 20) and recovered 92 marked fish. Of these, 80 had tags and were recaptured 5 to 37 days (mean = 19.5 days) after being marked in the lower river. Twelve recovered fish were missing tags but the secondary fin clip was recognized.

The CDF of lengths of chum salmon marked in the fish wheels was not significantly different from the CDF of marked chum salmon recaptured on the spawning grounds (*K-S* test, $d_{max}$ = 0.032, $P$ = 0.213; Figure 10, top). In addition, the CDF of lengths of chum salmon marked in the fish wheels was not significantly different from the CDF of all fish (marked and unmarked combined) recovered during second-event sampling (*K-S* test, $d_{max}$ = 0.113, $P$ = 0.679; Figure 10, bottom). These results indicate there was no size selectivity during either sampling event. Therefore, we used the pooled-Petersen model to estimate the population abundance of chum salmon. We estimate that 166,000 (SE = 17,000) chum salmon immigrated into the Chilkat River in 2003. This estimate was germane to the time of tagging in the lower river, because an unquantified removal occurs (from natural mortality and subsistence fishery harvest) between the 2 sampling events.

One of the objectives of this study was to develop a relationship between mark-recapture results, fish wheel catch and peak aerial survey counts. We compared the results of the 3 stock assessment methods to determine if a relationship exists among them. If such a relationship exists, we can conclude that fish wheel catch or aerial escapement counts can be a dependable index of the population size.

The sum of the 2003 peak aerial survey was 28% of the mark-recapture estimate (166,000) and 2.3% of the total fish wheel catch (3,846). In 2003, the mark-recapture estimate was 3.5 times the drainagewide peak aerial survey count and 43.1 times the total fish wheel catch. Results for

the first 3 years of this study are presented in Table 21. The average proportion of the population estimate captured in the fish wheels and counted during aerial surveys was 0.02 and 0.26, respectively, for years 2002 to 2004.

### *2004 Chum Salmon*

Of the total fish wheel catch of 4,266 chum salmon, 4,249 fish where tagged and fin clipped (Table 22); 17 chum salmon escaped prior to being marked at the fish wheels.

We examined 18,410 chum salmon on the spawning grounds for marks (Table 23) and recovered 239 marked fish. Of these, 144 had tags and were recaptured 6 to 52 days (mean = 23.8 days) after being marked in the lower river. Of the marked fish, 28 were missing tags but the secondary fin clip was recognized.

The CDF of lengths of chum salmon marked in the fish wheels was not significantly different from the CDF of marked chum salmon recaptured on the spawning grounds (*K-S* test, $d_{max}$ = 0.036, $P$ = 0.052; Figure 11, top). In addition, the CDF of lengths of chum salmon marked in the fish wheels was not significantly different from the CDF of all fish (marked and unmarked combined) recovered during second-event sampling (*K-S* test, $d_{max}$ = 0.096, $P$ = 0.250; Figure 11, bottom). Based on this analysis, there was no size-selective sampling for fall chum salmon between both sampling events. Therefore, we used the pooled-Petersen model to estimate the abundance of chum salmon. We estimate that 330,000 (SE = 20,000) chum salmon immigrated into the Chilkat River in 2004. This estimate was germane to the time of tagging in the lower river because an unquantified removal occurs (from natural mortality and subsistence fishery harvest) between the 2 sampling events.

## Age and Sex Composition of the Inriver Run Abundance

### *2003 Sockeye Salmon*

We sampled 898 small and 1,834 large sockeye salmon for age (scales), sex and length in the Chilkat River drainage during 2003. A total of 2,732 fish were successfully aged, representing 12 age classes (Table 24). Additionally, 2,586 small and 4,652 large sockeye salmon were sampled for length determination during the first and second sampling events. The proportion of small fish sampled for age in the fish wheels (0.28) was very close to the proportion of small fish in the abundance estimate (0.27). This analysis, along with prior tests that showed the second sampling event was selective for size, suggests the first sampling event may not have been size selective. Therefore, samples from the first event (Table 24) were used to estimate the age-sex-length composition of the sockeye escapement. The majority of the sockeye escapement was fish of ages 2.3 (59,000 fish) and 1.3 (23,000 fish; Table 25).

### *2004 Sockeye Salmon*

We sampled 731 small and 2,493 large sockeye salmon for age (scales), sex and length in the Chilkat River drainage during 2004. A total of 3,224 fish was successfully aged, representing 12 age classes (Table 26). Additionally, 3,645 small and 6,225 large sockeye salmon were sampled for length determination during the first and second sampling events. Similar to results in 2003, the proportion of small fish sampled for age in the fish wheels (0.24) was close to the proportion of small fish in the abundance estimate (0.20). This analysis, along with prior tests that showed the second sampling event was selective for size, suggests that the first sampling event may not have been size selective. Therefore, samples from the first event were used to estimate the age

sex and length composition of the sockeye escapement. The majority of the sockeye escapement was fish of ages 1.3 (estimated 68,000 fish) and 2.2 (estimated 27,000 fish; Table 27).

### *2003 Chum Salmon*

In 2003, we sampled 1,371 male and 1,189 female chum salmon for age (scales), sex determination and length. Of the 2,560 chum salmon sampled, a total of 2,539 were successfully aged, representing 5 age classes (Table 28). The average length for the dominant age class (age-0.3) fish was 609 mm MEF (Table 29). Sex ratios from the 2 distinct second-event areas (Chilkat River and Klehini River) were similar, which supported pooling of all strata for the population estimate ($X^2 = 0.39$, $df = 1$, $P = 0.51$).

Sex ratio comparisons from samples collected from the fish wheels (first event) and on spawning ground recovery trips (second event) were significantly different ($X^2 = 26.2$, $df = 1$, $P < 0.001$). The majority of the chum salmon samples collected on the fish wheels early in the season were predominantly males. Samples taken from the fish wheels late in the season were predominantly females. The fall chum salmon run is very protracted, until late into the fall season, and samples from the spawning grounds tend to include fish that passed the fish wheels earlier in the season. Therefore, age sex and length compositions of the chum escapement were determined from fish wheel samples. The most abundant age class in the chum escapement was age-0.3 (estimated 131,000 fish; Table 30).

### *2004 Chum Salmon*

In 2004, we sampled 1,423 male and 1,252 female chum salmon for age (scales), sex determination and length. A total of 2,600 fish were successfully aged, representing 3 age classes (Table 31). The average length for the dominant age class (age-0.3) fish was 623 mm MEF (Table 32). Sex ratios from the 2 second-event areas (Chilkat River and Klehini River) were not significantly different ($X^2 = 0.41$, $df = 1$, $P = 0.50$), which supported pooling of all strata for the abundance estimate. As in 2002 and 2003, sex ratio comparisons from samples collected from the fish wheels and on spawning ground recovery trips were significantly different ($X^2 = 24.2$, $df = 1$, $P < 0.001$). This result is a function of sex composition changes over time during the migration. Male chum salmon dominate the run earlier in the migration period. The majority of the chum salmon samples collected on the fish wheels early in the season were predominantly males. Samples taken from the fish wheels later in the migration were predominantly females. The fall chum run is very protracted and extends until late into the fall season, and samples from the spawning grounds tend to include fish that passed the fish wheels early in the season. Therefore, age sex and length compositions for the chum escapement were determined from fish wheel samples. The most abundant age class in the escapement was age-0.3 (estimated 256,000 fish; Table 33).

# DISCUSSION

The accuracy of mark-recapture studies in providing estimates of abundance was dependent on the degree to which the underlying assumptions, as noted above, were satisfied. The first assumption (a) is that all fish have an equal probability of being captured and marked. During both 2003 and 2004, fish wheels were operated beginning in early June and the first fish were caught one or more days after deployment (Table 4 and Appendix B). Fish wheels were operated 24 hours per day except during equipment breakdowns, debris entanglements or high water events; however, it is known that river conditions affect the fishing efficiencies of both wheels.

Fish wheels were in operation well before the first chum salmon was captured on July 6 (2003) and July 15 (2004); the bulk of the fish wheel catch of chum salmon occurred after August 21. The sockeye catch during the last week of fish wheel operations was minimal for both years. Unlike 2002, we did not observe large numbers of chum salmon moving into the lower river near the end of the fish wheel season. We terminated fish wheel operations after the third week in October, based on the pattern of fish wheel catches observed in 1990; less than 1% of the annual chum salmon catch was captured between October 20 and October 25 of that year (Figure 12). Thus, we assume that we captured and marked fish over essentially the entire sockeye and chum salmon migration in 2003 and 2004.

Adult coho salmon have been known to back out of some rivers after being tagged (Ericksen 2003*b*). If this phenomena occurred with sockeye and chum salmon, assumption (a), equal mixing and equal probability of marking and recovery, would be violated, if marked fish were caught in fisheries down river from the tagging site (fish wheels), or ultimately spawned in other river systems. Our marking site is located several miles upstream of the intertidal zone. In addition, sockeye salmon that were fixed with radio tags in 2003 and 2004 did not back out of the Chilkat River system, but continued upstream to spawning areas (Brian Elliott, ADF&G Division of Sport Fish, *personal communication*). Thus, we assume this phenomenon did not occur in this study.

We concluded that fish wheels were not size-selective for sockeye salmon, but that recapture methods were size-selective, because length distributions of marked fish in the first event and recaptured fish in the second event were dissimilar for both years of this study. Because probabilities of capture were not equal for fish of all size classes during second-event (recapture) sampling, we stratified the sockeye salmon population by size category. Cumulative length distributions of chum salmon marked in the first event and recaptured in the second event were similar. Probabilities of capture were equal for fish of all size classes sampled during the second event; stratification of the population was therefore not necessary for fall chum salmon. We used the Petersen estimator to calculate the chum salmon population size. The divergent results between both species suggest that within-year differences in the fish wheel catchability exist, perhaps related to gear placement, or changes in stream morphology caused by variations in stream discharge throughout the season.

All fish had an equal probability of being captured in event 2 (assumption a) in our study. We conducted recovery sampling until all Chilkat River mainstem sockeye salmon had completed spawning. We also conducted second-event sampling at the Chilkat Lake weir for Chilkat Lake sockeye salmon until we were certain that the majority of the escapement had passed through the weir. NSRAA and ADF&G crews sampled 45 (2003) and 125 (2004) sockeye salmon during the last week of weir operations, and recovered fish marked during the last stratum sampled at the fish wheels. Historical weir data indicate that approximately 99% of the Chilkat Lake sockeye salmon run passes the weir by October 16 (Figure 13). We sampled chum salmon on the spawning grounds through November 8 in 2003 and November 2 in 2004, and we recovered marked chum salmon that had been tagged during the last marking stratum on the fish wheels in both years.

We believe that non-recognition or non-reporting of marks (assumption e for Petersen estimate) was negligible. All marked sockeye salmon were given primary (adipose fin clip, T-bar tag) and secondary marks (additional fin clips). Since fish examined during second-event sampling were

alive and not in advanced stages of decomposition, marks were not likely to be missed. Sampling crews were trained and aware of all specific marks.

We assumed that mortality of marked fish was negligible (assumption c for Petersen estimate). In a similar project on the Taku River, holding studies of sockeye salmon captured at a fish wheel indicated negligible short-term mortality due to tagging and handling (Kelley et al. 1997). Tagging and marking of sockeye salmon at both the Taku and Chilkat rivers takes only 30 to 50 seconds. Standard protocol for mark-recapture projects on both the Taku and Chilkat rivers is to refrain from marking or tagging salmon that exhibit serious wounds or that are lethargic in behavior. While it was not possible to definitively conclude that mortality of marked fish differed from unmarked fish, we have no information to suggest that mark-induced mortality was an important factor in our study. Results of radio telemetry work conducted during 2003 and 2004 also indicated that handling-induced mortality at the fish wheels was very small (Brian Elliott, ADF&G Division of Sport Fish, personal communication).

Kelley et al. (1997) concluded that tagging and handling procedures could affect fish behavior (assumption c). Their study on the Taku River found that effects could be species-specific. They found that tagged Chinook salmon recaptured in the fish wheels had been delayed for much longer periods (mean of 12.3 days) than either sockeye (mean 3.6 days) or coho salmon (mean of 4.3 days); these results were similar to those observed at the Taku River in 1988 (McGregor and Clark 1989). The authors assumed that marked fish dropped back or held near the vicinity of the capture site before resuming their upstream migration.

The effects of the length of time that fish are held in fish wheel live boxes before being tagged or marked was also examined at the Taku River in 1996 (Kelley et al. 1997). No significant differences in elapsed days from fish wheel release to recovery in the inriver commercial fishery were apparent between groups of fish held for a long time and groups held for a short time for Chinook, sockeye, and coho salmon. Also, no substantial differences in tag recovery rate for a given species for the 2 holding times were discovered, which was similar to observations of McGregor and Clark (1989) for Chinook salmon in 1988.

The removal of an unknown quantity of sockeye salmon between mark and recovery sites occurred in the Chilkat River subsistence gillnet fishery, located between the fish wheels and spawning sites. Subsistence fishing effort typically peaks with the sockeye salmon run in the Chilkat River. Sampling of the subsistence fishery for marks is not conducted. We assumed that removal rates of sockeye salmon in this fishery did not influence our population estimates, as low numbers of fish are harvested in the fishery relative to the total inriver run. We also assumed that removal rates are similar for marked and unmarked sockeye salmon in the subsistence fishery.

In this study, abundance estimates for the Chilkat Lake and Chilkat River mainstem components of the escapement were developed by applying weekly fish wheel CPUE and stock composition data to the drainagewide abundance estimate. It is known that the stock composition of sockeye salmon migrating past the fish wheels changes through time. Error or uncertainty in the stock identification would introduce bias to the total and weekly estimates of abundance for different components of the return. Results of the radio telemetry studies in 2003 and 2004, however, indicated that the stock composition determinations made from scale samples collected at the fish wheels was nearly perfect. During 2003 and 2004, 111 and 203 radio tags were deployed from the Chilkat River fish wheels. All radio-tagged fish that were found in or near a spawning

area had been correctly assigned to stock of origin based on the stock identification of scale samples collected from those fish at the fish wheels (Brian Elliott, ADF&G Division of Sport Fish, *personal communication*).

The Chilkat River mark-recapture program has become an integral part of the department's stock assessment and management program for salmon in upper Lynn Canal. In order to meet escapement goal requirements, ADF&G commercial fishery managers use abundance and stock composition data from this program, together with fishery performance data from the drift gillnet fishery in Lynn Canal, to adjust fishing times, catches and escapements (Bachman et al. 1999). 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 for run reconstruction of Chilkat River drainage sockeye and fall chum salmon stocks. Currently, the fish wheel catch is used as an inseason index of relative abundance, by comparing weekly fish wheel catch with historical averages. Run reconstruction conducted over a number of years has provided a time series useful for the development of spawner-recruit relationships. These documented spawner-recruit relationships are necessary for forecasting of future returns and for refining and developing biological escapement goals that will provide for maximum sustained yield of these stocks.

# RECOMMENDATIONS

1. Continue to operate the weir at the outlet of Chilkat Lake as a recovery platform, and as an integral part of the sockeye salmon escapement estimation project for the Chilkat River drainage
2. Examine larger numbers of marked and unmarked fish for length and sex during second-event sampling
3. Continue making necessary safety and fish-handling modifications to the fish wheels

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# TABLES AND FIGURES

Table 1.–Chilkat fish wheels, dates of operation, and catches of Chinook, sockeye, coho, pink, and chum salmon, 1977, 1978, 1982, 1983, 1990, 1991, and 1994 to 2004.

| Year | Dates of Operation | Chinook | Sockeye | Coho | Pink | Chum | Number, Type, and Basket Configuration of Fish wheels |
|---|---|---|---|---|---|---|---|
| 1977 | 8/21–10/21 | 0 | 108 | 729 | 0 | 604 | N/A |
| 1978 | 8/14–11/9 | 0 | 119 | 369 | 14 | 1,586 | N/A |
| 1982 | 10/5–26 | 0 | 10 | 78 | 0 | 254 | 1 wooden 4–basket wheel |
| 1983 | 8/9–10/3 | 0 | 299 | 190 | 67 | 176 | 1 wooden 4-basket wheel |
| 1990 | 8/14–10/25 | 0 | 2,984 | 3,686 | 1,140 | 3,025 | 2 wooden 4-basket wheels |
| 1991 | 6/10–7/20 | 382 | 1,385 | 0 | 578 | 8 | 2 wooden 4-basket wheels |
| 1994 | 6/18–9/11 | 214 | 3,865 | 140 | 532 | 196 | 2 wooden 4-basket wheels |
| 1995 | 6/16–9/16 | 139 | 3,231 | 1,353 | 609 | 2,288 | 2 wooden 4-basket wheels |
| 1996 | 6/22–9/16 | 68 | 3,118 | 546 | 494 | 430 | 2 wooden 4-basket wheels |
| 1997 | 6/11–10/9 | 179 | 5,016 | 1,057 | 1,657 | 1,315 | 2 aluminum 3-basket wheels |
| 1998 | 6/8–10/13 | 138 | 5,747 | 1,071 | 1,738 | 1,947 | 2 aluminum 3-basket wheels |
| 1999 | 6/7–10/8 | 320 | 7,735 | 1,697 | 15,740 | 4,250 | 2 aluminum 3-basket wheels |
| 2000 | 6/9–10/7 | 99 | 3,709 | 1,495 | 1,265 | 4,045 | 2 aluminum 3-basket wheels |
| 2001 | 6/6–10/7 | 172 | 4,417 | 2,550 | 1,971 | 4,680 | 2 aluminum 3-basket wheels |
| 2002 | 6/7–10/19 | 270 | 4,219 | 5,090 | 1,030 | 2,895 | 2 aluminum 3-basket wheels |
| 2003 | 6/6–10/21 | 289 | 4,551 | 5,306 | 2,903 | 3,402 | 2 aluminum 3-basket wheels |
| 2004 | 6/7–10/19 | 185 | 4,366 | 1,745 | 5,821 | 4,266 | 2 aluminum 3-basket wheels |
| Average Catch[a] | | 188 | 4,543 | 2,005[b] | 3,069 | 2,534[b] | |

[a] Average catch taken from the 1994–2004 catch years where dates of operation are comparable.

[b] Average calculated from 1990, and 1997 to 2004.

Table 2.–Secondary fin clips applied to sockeye salmon, by date, during 2003 and 2004.

| 2003 Dates | Statistical Weeks[a] | Secondary Mark[b] |
|---|---|---|
| Start to June 14 | Start to 24 | Adipose fin clip only |
| June 15 to June 28 | 25–26 | Right axillary appendage clip |
| June 29 to July 12 | 27–28 | Left axillary appendage clip |
| July13 to July 26 | 29–30 | Right ventral fin clip |
| July 27 to August 9 | 31–32 | Left ventral fin clip |
| August 10 to August 23 | 33–34 | Dorsal (last 4 rays) fin clip |
| August 24 to September 6 | 35–36 | Right pectoral fin clip |
| September 7 to September 20 | 37–38 | Left pectoral fin clip |
| September 21 to October 4 | 39–40 | Right axillary appendage clip |
| October 5 to End | 41–End | Left axillary appendage clip |

| 2004 Dates | Statistical weeks[a] | Secondary mark[b] |
|---|---|---|
| Start to June 12 | Start-24 | Adipose fin clip only |
| June 13 to June 26 | 25–26 | Right axillary appendage clip |
| June 27 to July 10 | 27–28 | Left axillary appendage clip |
| July11 to July 24 | 29–30 | Right ventral fin clip |
| July 25 to August 7 | 31–32 | Left ventral fin clip |
| August 8 to August 21 | 33–34 | Right pectoral fin clip |
| August 22 to September 4 | 35–36 | Left pectoral fin clip |
| September 5 to September 18 | 37–38 | Clip last 4 rays of dorsal fin |
| September 19 to October 2 | 39–40 | Right axillary appendage |
| October 3 to End | 41–End | Left axillary appendage |

[a] Statistical weeks are defined in Appendix A.

[b] All sockeye salmon received an adipose fin clip, numbered T-bar tag and secondary fin clips to designate the statistical week of capture.

Table 3.–Secondary fin clips applied to chum salmon, by date, during 2003 and 2004.

| 2003 Dates | Statistical Weeks[a] | Secondary Mark[b] |
|---|---|---|
| July15 to July 26 | 29–30 | Right ventral fin clip |
| July 27 to August 9 | 31–32 | Left ventral fin clip |
| August 10 to August 23 | 33–34 | Dorsal (last 4 rays) fin clip |
| August 24 to September 6 | 35–36 | Right pectoral fin clip |
| September 7 to September 20 | 37–38 | Left pectoral fin clip |
| September 21 to October 4 | 39–40 | Right axillary appendage clip |
| October 5 to October 21 | 41–End | Left axillary appendage clip |

| 2004 Dates | Statistical Weeks | Secondary Mark |
|---|---|---|
| June 27 to July 10 | 27–28 | Left axillary appendage clip |
| July11 to July 24 | 29–30 | Right ventral fin clip |
| July 25 to August 7 | 31–32 | Left ventral fin clip |
| August 8 to August 21 | 33–34 | Right pectoral fin clip |
| August 22 to September 4 | 35–36 | Left pectoral fin clip |
| September 5 to September 18 | 37–38 | Clip last 4 rays of dorsal fin |
| September 19 to October 2 | 39–40 | Right axillary appendage |
| October 3 to October 19 | 41–End | Left axillary appendage |

[a] Statistical weeks are defined in Appendix A.

[b] All chum salmon received an adipose fin clip, numbered spaghetti tag and secondary fin clips to designate the statistical week of capture.

Table 4.–Chilkat Lake weir dates of operation and visual counts of sockeye, coho, pink, and chum salmon, 1967–1995 and 1999–2004.

| Year | Dates of Operation | Sockeye | Coho[a] | Pink | Chum |
|---|---|---|---|---|---|
| 1967 | 6/13–9/02 | 20,111 | n/a | n/a | n/a |
| 1968 | 6/08–9/12 | 41,246 | 168 | 4[a] | n/a |
| 1969 | 6/04–9/16 | 44,555 | n/a | n/a | n/a |
| 1970 | 5/29–9/17 | 41,085 | n/a | n/a | n/a |
| 1971 | 5/31–10/28 | 49,342 | 1,063 | n/a | n/a |
| 1972 | 6/03–10/12 | 51,850 | 518 | n/a | n/a |
| 1973 | 6/11–10/15 | 50,527 | 167 | n/a | n/a |
| 1974 | 5/30–9/28 | 82,811 | 161 | n/a | n/a |
| 1975 | 6/04–11/06 | 41,520 | 644 | n/a | n/a |
| 1976 | 6/03–10/21 | 69,723 | 204 | n/a | n/a |
| 1977 | 6/03–9/27 | 41,044 | n/a | n/a | n/a |
| 1978 | 6/05–11/05 | 67,520 | 390 | n/a | n/a |
| 1979 | 6/09–11/11 | 80,589 | 965 | n/a | n/a |
| 1980 | 6/15–10/8 | 87,847 | n/a | n/a | n/a |
| 1981 | 6/11–10/22 | 82,597 | n/a | n/a | n/a |
| 1982 | 6/24–10/06 | 80,208 | n/a | n/a | n/a |
| 1983 | 6/22–11/12 | 134,022 | n/a | n/a | n/a |
| 1984 | 6/09–10/07 | 115,269 | n/a | n/a | n/a |
| 1985 | 6/23–10/22 | 57,724 | n/a | n/a | n/a |
| 1986 | 6/16–11/14 | 23,947 | n/a | n/a | n/a |
| 1987 | 6/19–11/20 | 48,593 | n/a | n/a | n/a |
| 1988 | 6/18–11/14 | 27,575 | n/a | n/a | n/a |
| 1989 | 6/05–10/28 | 140,475 | n/a | n/a | n/a |
| 1990 | 6/06–11/13 | 53,780 | n/a | n/a | n/a |
| 1991 | 7/10–10/24 | 47,436 | n/a | n/a | n/a |
| 1992 | 6/08–10/15 | 94,278 | 1,052 | 2 | 41 |
| 1993 | 6/13–10/14 | 210,257 | 595 | 0 | 5 |
| 1994 | 5/20–10/05 | 80,788 | 797 | 0 | 0 |
| 1995 | 6/08–10/09 | 59,698 | 797 | 0 | 0 |
| 1999[b] | 6/30–10/23 | 129,533 | 2,785 | 17 | 10 |
| 2000 | 6/16–10/18 | 47,077 | 872 | 0 | 0 |
| 2001 | 6/19–10/13 | 51,979 | 978 | 0 | 0 |
| 2002 | 6/23–10/18 | 65,085 | 4,740 | 0 | 1 |
| 2003 | 6/27–10/10 | 52,417 | 1,678 | 0 | 0 |
| 2004 | 7/6–10/13 | 75,632 | 4,989 | 0 | 0 |

Source: Statewide electronic fish tickets, recorded in Alexander, the Integrated Fisheries Database (IFDB). 1st edition. Alaska Department of Fish and Game. 1988 to present.

[a] Weir counts do not reflect total escapement as weir was not operated through entire course of coho salmon return.

[b] Weir was not operated in years 1996–1998 as sockeye salmon sampling was conducted using beach seines on spawning areas in Chilkat Lake.

Table 5.–Number of sockeye salmon captured in the lower Chilkat River fish wheels, and marked by temporal strata and size class[a], June 12 through October 19, 2003.

| Date | Finclip | Number Captured | Number Marked | | | Proportion Marked |
|---|---|---|---|---|---|---|
| | | | Small | Large | Total | |
| 6/9–6/14 | Adipose fin clip only | 6 | 2 | 3 | 5 | 0.83 |
| 6/15–6/28 | Right axillary appendage clip | 243 | 93 | 140 | 233 | 0.96 |
| 6/29–7/12 | Left axillary appendage clip | 505 | 235 | 265 | 500 | 0.99 |
| 7/13–7/26 | Right ventral fin clip | 385 | 138 | 205 | 343 | 0.89 |
| 7/27–8/9 | Left ventral fin clip | 591 | 124 | 410 | 534 | 0.90 |
| 8/10–8/23 | Right pectoral fin clip | 1,018 | 227 | 763 | 990 | 0.97 |
| 8/24–9/6 | Left pectoral clip | 988 | 180 | 720 | 900 | 0.91 |
| 9/7–9/20 | Dorsal fin clip | 543 | 85 | 309 | 394 | 0.73 |
| 9/21–10/21 | Right axillary appendage clip | 272 | 26 | 87 | 113 | 0.42 |
| Total | | 4,551 | 1,110 | 2,902 | 4,012 | 0.88 |

[a] Fish were classified by mid-eye-to-fork length (MEF): 360 mm≤small ≤ 520 mm MEF; large > 520 mm MEF.

Table 6.–Number of sockeye salmon inspected for marks and number of marked fish recaptured during mark-recovery surveys in the Chilkat River by site, size class[a] and sex, 2003.

| Site | Number Inspected | | | | | Number Marked | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Small | | Large | | | Small | | Large | | |
| Dates | M | F | M | F | Total | M | F | M | F | Total |
| **Chilkat Lake weir** | | | | | | | | | | |
| 7/3–7/5 | 55 | 14 | 153 | 168 | 389 | 0 | 0 | 2 | 0 | 2 |
| 7/6–7/12 | 32 | 7 | 50 | 52 | 141 | 0 | 0 | 0 | 0 | 0 |
| 7/13–7/19 | 23 | 7 | 182 | 244 | 455 | 0 | 0 | 2 | 2 | 4 |
| 7/20–7/26 | 32 | 11 | 173 | 253 | 469 | 1 | 0 | 2 | 3 | 6 |
| 7/27–8/2 | 25 | 25 | 200 | 219 | 469 | 0 | 1 | 2 | 3 | 6 |
| 8/3–8/9 | 30 | 30 | 228 | 178 | 464 | 0 | 3 | 0 | 4 | 7 |
| 8/10–8/16 | 9 | 18 | 153 | 239 | 419 | 0 | 0 | 0 | 3 | 3 |
| 8/17–8/23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8/24–8/30 | 30 | 14 | 232 | 214 | 489 | 1 | 2 | 5 | 12 | 20 |
| 8/31–9/6 | 11 | 14 | 96 | 64 | 184 | 0 | 0 | 0 | 4 | 4 |
| 9/7–9/13 | 23 | 36 | 155 | 351 | 565 | 0 | 0 | 1 | 9 | 10 |
| 9/14–9/20 | 16 | 32 | 233 | 203 | 483 | 1 | 5 | 6 | 4 | 16 |
| 9/21–9/27 | 9 | 11 | 237 | 200 | 458 | 1 | 1 | 10 | 4 | 16 |
| 9/28–10/4 | 7 | 23 | 244 | 205 | 478 | 0 | 0 | 7 | 6 | 13 |
| 10/5–10/11 | 5 | 18 | 273 | 187 | 483 | 0 | 4 | 5 | 10 | 19 |
| Total | 305 | 260 | 2,608 | 2,775 | 5,948 | 4 | 16 | 41 | 63 | 124 |
| **Chilkat River Mainstem** | | | | | | | | | | |
| 7/6–7/12 | 0 | 0 | 23 | 1 | 24 | 0 | 0 | 0 | 0 | 0 |
| 7/13–7/19 | 59 | 1 | 45 | 38 | 144 | 5 | 0 | 2 | 1 | 8 |
| 7/20–7/26 | 87 | 2 | 38 | 53 | 181 | 3 | 0 | 4 | 7 | 14 |
| 7/27–8/2 | 197 | 24 | 17 | 71 | 308 | 9 | 1 | 1 | 4 | 15 |
| 8/3–8/9 | 119 | 7 | 23 | 20 | 169 | 3 | 0 | 4 | 1 | 8 |
| 8/10–8/16 | 158 | 10 | 12 | 31 | 212 | 3 | 2 | 1 | 2 | 8 |
| 8/17–8/23 | 125 | 5 | 11 | 12 | 154 | 5 | 1 | 1 | 1 | 8 |
| 8/24–8/30 | 142 | 1 | 1 | 6 | 150 | 4 | 0 | 0 | 1 | 5 |
| 8/31–9/6 | 63 | 3 | 2 | 4 | 73 | 1 | 1 | 0 | 0 | 2 |
| Total | 950 | 54 | 173 | 237 | 1,414 | 33 | 5 | 13 | 17 | 68 |
| Grand Total | 1,255 | 314 | 2,780 | 3,013 | 7,362 | 37 | 21 | 54 | 80 | 192 |

[a] Fish were classified by mid-eye-to-fork length (MEF): 360 mm MEF≤ small ≤ 520 mm MEF; large > 520 mm MEF.

Table 7.–Number of marked sockeye salmon released into the lower Chilkat River and recaptured by marking period and recovery site, and number examined for marks at each recovery site by size class, 2003.

| Marking Stratum (Date) | Number Marked | Fraction Recovered | Chilkat Lake Weir | Chilkat River Mainstem |
|---|---|---|---|---|
| **Small Fish (> 360 mm and ≤ 520 mm mid-eye-to-fork length)** | | | | |
| 6/9–6/14 | 2 | 0.000 | 0 | 0 |
| 6/15–6/28 | 93 | 0.108 | 0 | 10 |
| 6/29–7/12 | 235 | 0.072 | 2 | 15 |
| 7/13–7/26 | 138 | 0.080 | 0 | 11 |
| 7/27–8/9 | 124 | 0.032 | 3 | 1 |
| 8/10–8/23 | 227 | 0.026 | 5 | 1 |
| 8/24–9/6 | 180 | 0.028 | 5 | 0 |
| 9/7–9/20 | 85 | 0.035 | 3 | 0 |
| 9/21–10/21 | 26 | 0.038 | 1 | 0 |
| Examined for marks | | | 565 | 1,004 |
| Fraction marked | | | 0.034 | 0.038 |
| **Large Fish (>520 mm mid-eye-to-fork length)** | | | | |
| 6/9–6/14 | 3 | 0.333 | 1 | 0 |
| 6/15–6/28 | 140 | 0.036 | 1 | 4 |
| 6/29–7/12 | 265 | 0.087 | 10 | 13 |
| 7/13–7/26 | 205 | 0.083 | 8 | 9 |
| 7/27–8/9 | 410 | 0.029 | 10 | 2 |
| 8/10–8/23 | 763 | 0.035 | 27 | 0 |
| 8/24–9/6 | 720 | 0.036 | 26 | 0 |
| 9/7–9/20 | 309 | 0.058 | 18 | 0 |
| 9/21–10/21 | 87 | 0.069 | 6 | 0 |
| Examined for marks | | | 5,384 | 411 |
| Fraction marked | | | 0.020 | 0.068 |

Table 8.–Pooled number of sockeye salmon marked by stratum, recovered by marking stratum and recovery area, and examined for marks by recovery area and size class in the Chilkat River drainage, 2003.

| Marking Stratum (Date) | Number Marked | Fraction Recovered | Chilkat Lake Weir | Chilkat River Mainstem |
|---|---|---|---|---|
| **Small Fish (>360 mm and ≤ 520 mm mid-eye-to-fork length)** | | | | |
| 6/9–7/12 | 330 | 0.024 | 8 | 0 |
| 7/14–8/24 | 489 | 0.035 | 3 | 14 |
| 8/25–10/19 | 291 | 0.048 | 2 | 12 |
| Examined for marks | | | 565 | 1,004 |
| Fraction marked | | | 0.023 | 0.026 |
| **Large Fish (>520 mm mid-eye-to-fork length)** | | | | |
| 6/9–7/12 | 408 | 0.081 | 15 | 18 |
| 7/14–8/24 | 1,378 | 0.050 | 45 | 24 |
| 8/25–10/19 | 1,116 | 0.046 | 51 | 0 |
| Examined for marks | | | 5,383 | 410 |
| Fraction marked | | | 0.021 | 0.102 |

Table 9.–Estimated abundance of sockeye salmon (mid-eye-to-fork length>360 mm) in the Chilkat River drainage by size class, 2003.

| Size category | Abundance | Standard Error |
|---|---|---|
| Small Fish (> 360 mm and ≤ 520 mm mid-eye-to-fork length) | 40,606 | 6,601 |
| Large Fish (>520 mm mid-eye-to-fork length) | 109,220 | 8,423 |
| Combined | 149,826 | 10,584 |

Table 10.–Estimated weekly abundance of Chilkat Lake and Chilkat River mainstem sockeye salmon stocks in the Chilkat River drainage, 2003.

| Stat | Mid-Week | Weekly | Abundance | Chilkat | Chilkat | Chilkat Lake | | Chilkat Mainstem | |
|---|---|---|---|---|---|---|---|---|---|
| Week | Date | Proportion | Estimate | Lake | mainstem | Age 1. | Age 2. | Age 0. | Age 1. |
| 24 | 11-Jun | 0.001 | 187 | 140 | 47 | 0.50 | 0.25 | 0.00 | 0.25 |
| 25 | 18-Jun | 0.016 | 2,390 | 1,398 | 992 | 0.49 | 0.09 | 0.23 | 0.19 |
| 26 | 25-Jun | 0.041 | 6,199 | 2,148 | 4,051 | 0.29 | 0.06 | 0.43 | 0.22 |
| 27 | 2-Jul | 0.069 | 10,382 | 2,827 | 7,555 | 0.24 | 0.04 | 0.54 | 0.18 |
| 28 | 9-Jul | 0.049 | 7,357 | 1,883 | 5,474 | 0.18 | 0.08 | 0.59 | 0.15 |
| 29 | 16-Jul | 0.049 | 7,357 | 3,027 | 4,330 | 0.30 | 0.11 | 0.44 | 0.15 |
| 30 | 23-Jul | 0.035 | 5,228 | 2,498 | 2,684 | 0.32 | 0.16 | 0.32 | 0.19 |
| 31 | 30-Jul | 0.037 | 5,564 | 2,968 | 2,597 | 0.19 | 0.35 | 0.24 | 0.23 |
| 32 | 6-Aug | 0.097 | 14,527 | 10,872 | 3,608 | 0.13 | 0.61 | 0.11 | 0.14 |
| 33 | 13-Aug | 0.124 | 18,560 | 16,530 | 1,958 | 0.10 | 0.79 | 0.05 | 0.05 |
| 34 | 20-Aug | 0.118 | 17,664 | 16,080 | 1,505 | 0.06 | 0.85 | 0.03 | 0.05 |
| 35 | 27-Aug | 0.120 | 18,037 | 16,637 | 1,071 | 0.03 | 0.89 | 0.03 | 0.03 |
| 36 | 3-Sep | 0.116 | 17,328 | 16,996 | 249 | 0.03 | 0.95 | 0.00 | 0.01 |
| 37 | 10-Sep | 0.060 | 9,000 | 8,805 | 0 | 0.02 | 0.96 | 0.00 | 0.00 |
| 38 | 17-Sep | 0.038 | 5,751 | 5,654 | 0 | 0.02 | 0.97 | 0.00 | 0.00 |
| 39 | 24-Sep | 0.029 | 4,295 | 4,156 | 0 | 0.01 | 0.96 | 0.00 | 0.00 |
| Total | | | 149,826 | 112,618 | 36,119 | | | | |

Table 11.–Historical estimated escapements of Chilkat Lake sockeye salmon by week, 1976 to 2004.

| Stat. | Year | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Week | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 |
| 23 | | | | | | | | | | | | | | 62 | |
| 24 | 1 | | 22 | 6 | | | | | | | | | | 689 | 202 |
| 25 | | 214 | 476 | 44 | 72 | 3 | | | 302 | | | | | 5,802 | 639 |
| 26 | 433 | 305 | 1,302 | 698 | 887 | | 31 | 368 | 1,441 | 7 | 4 | 88 | 59 | 10,690 | 3,615 |
| 27 | 944 | 572 | 8,622 | 6,930 | 1,152 | 5 | 532 | 1,248 | 5,436 | 98 | 2 | 1,777 | 2,015 | 7,845 | 1,660 |
| 28 | 2,437 | 773 | 2,751 | 2,081 | 3,560 | 141 | 605 | 11,144 | 623 | 1,317 | 602 | 2,197 | 496 | 2,295 | 4,353 |
| 29 | 1,140 | 207 | 11,816 | 8,576 | 4,355 | 549 | 461 | 15,284 | 3,280 | 1,141 | 139 | 5,601 | 9 | 8,126 | 9,566 |
| 30 | 2,055 | 542 | 1,310 | 4,068 | 4,575 | 1,071 | 2,515 | 8,935 | 6,011 | 334 | 20 | 2,542 | 722 | 15,810 | 2,380 |
| 31 | 2,816 | 711 | 1,814 | 1,413 | 2,100 | 1,002 | 1,743 | 10,750 | 929 | 812 | 24 | 1 | 1,969 | 3,161 | 1,449 |
| 32 | 310 | 1,184 | 40 | 2,056 | 2,100 | 266 | 3,496 | 6,865 | 141 | 2,029 | 1 | 123 | 1,965 | 4,340 | 1,925 |
| 33 | 2,740 | 725 | 1,078 | 5,895 | 2,100 | 729 | 509 | 4,254 | 2,971 | 157 | 3 | 1,776 | 200 | 11 | 380 |
| 34 | 9,810 | 968 | 1,634 | 7,288 | 5,666 | 1,450 | 4,073 | 5,589 | 1,417 | 1,555 | 138 | 1,875 | 566 | 3,207 | 2,948 |
| 35 | 4,283 | 1,269 | 1,246 | 11,212 | 6,910 | 767 | 5,151 | 1,433 | 14,899 | 4,434 | 736 | 6,193 | 280 | 7,582 | 7,167 |
| 36 | 6,799 | 18,711 | 5,670 | 3,639 | 10,351 | 4,967 | 1,575 | 5,475 | 18,015 | 3,271 | 1,006 | 1,618 | 469 | 8,379 | 9,647 |
| 37 | 17,483 | 8,664 | 6,106 | 19,464 | 29,613 | 18,652 | 6,091 | 10,526 | 18,512 | 3,372 | 5,364 | 27 | 7,973 | 15,019 | 259 |
| 38 | 9,655 | 144 | 7,747 | 12 | 10,739 | 1,113 | 20,378 | 21,097 | 21,106 | 12,639 | 6,943 | 259 | 2,254 | 34,155 | 664 |
| 39 | 5,584 | 5,821 | 9,469 | 2,353 | 7,015 | 6,134 | 25,516 | 9,455 | 17,510 | 17,688 | 3,796 | 18,033 | 2,747 | 2,713 | 4,465 |
| 40 | 0 | 234 | 6,334 | 1,413 | 3,374 | 32,516 | 7,467 | 9,398 | 2,252 | 5,258 | 3,762 | 6,165 | 4,551 | 2,936 | 3,552 |
| 41 | 3,001 | | 91 | 2,125 | 778 | 10,222 | 78 | 7,305 | 424 | 2,009 | 831 | 0 | 655 | 3,053 | 4,456 |
| 42 | 238 | | | 1,316 | | 4,502 | | 5,081 | | 1,603 | 576 | 318 | 663 | 4,600 | 904 |
| Total | 69,729 | 41,044 | 67,528 | 80,589 | 95,347 | 84,089 | 80,221 | 134,207 | 115,269 | 57,724 | 23,947 | 48,593 | 27,593 | 140,475 | 60,231 |
| Early stock | 17,582 | 9,437 | 17,924 | 30,433 | 10,253 | 10,617 | 9,640 | 47,885 | 28,193 | 7,449 | 2,536 | 13,345 | 7,512 | 54,090 | 25,792 |
| Late stock | 52,147 | 31,607 | 49,604 | 50,156 | 85,094 | 73,472 | 70,581 | 86,322 | 87,076 | 50,275 | 21,411 | 35,248 | 20,081 | 86,385 | 34,439 |

–continued–

Table 11.–Page 2 of 2.

| | Year | | | | | | | | | | | | | | 1976 to 2004 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Week** | **1991** | **1992** | **1993** | **1994** | **1995** | **1996** | **1997** | **1998** | **1999** | **2000** | **2001** | **2002** | **2003** | **2004** | **Mean** | **SE** |
| 23 | 1 | – | – | – | – | – | – | – | – | – | – | – | – | – | 32 | 12 |
| 24 | 44 | 10 | – | – | 57 | – | 476 | 395 | 270 | 53 | 105 | 683 | 140 | 81 | 202 | 63 |
| 25 | 305 | 53 | 75 | – | 2,232 | – | 1,857 | 2,562 | 1,140 | 3,861 | 392 | 4,695 | 1,398 | 1,150 | 1,364 | 451 |
| 26 | 901 | 1,016 | 1,745 | 1,510 | 5,323 | 2,720 | 3,618 | 6,382 | 5,737 | 14,933 | 4,580 | 6,169 | 2,148 | 2,441 | 2,827 | 936 |
| 27 | 1,600 | 1,653 | 3,557 | 3,456 | 8,471 | 11,051 | 11,759 | 12,307 | 12,659 | 13,238 | 5,014 | 6,699 | 2,827 | 5,757 | 4,789 | 1,155 |
| 28 | 1,971 | 1,762 | 4,240 | 8,223 | 9,674 | 32,814 | 5,951 | 10,495 | 26,856 | 10,034 | 6,595 | 7,185 | 1,883 | 8,046 | 5,900 | 2,002 |
| 29 | 503 | 6,529 | 3,552 | 5,125 | 9,387 | 28,393 | 5,713 | 12,343 | 16,442 | 9,594 | 12,139 | 6,745 | 3,027 | 7,909 | 6,816 | 1,682 |
| 30 | 2,812 | 5,034 | 7,615 | 8,025 | 18,775 | 28,308 | 13,187 | 9,500 | 20,819 | 8,399 | 19,314 | 9,037 | 2,498 | 7,426 | 7,367 | 1,923 |
| 31 | 2,234 | 2,263 | 5,336 | 8,184 | 17,172 | 26,778 | 16,044 | 10,900 | 14,853 | 7,176 | 12,945 | 11,728 | 2,968 | 7,984 | 6,112 | 1,761 |
| 32 | 3,724 | 3,579 | 6,490 | 9,375 | 17,973 | 42,335 | 22,138 | 15,897 | 17,906 | 8,886 | 20,775 | 15,074 | 10,872 | 15,718 | 8,192 | 2,572 |
| 33 | 1,821 | 1,197 | 14,537 | 34,085 | 15,054 | 22,358 | 11,283 | 17,350 | 21,197 | 9,347 | 11,512 | 14,182 | 16,530 | 14,216 | 7,869 | 2,349 |
| 34 | 4,295 | 5,768 | 6,643 | 17,559 | 25,643 | 17,767 | 9,617 | 16,221 | 20,962 | 11,167 | 10,196 | 10,325 | 16,080 | 14,305 | 8,094 | 1,844 |
| 35 | 10,732 | 10,357 | 23,593 | 16,367 | 21,007 | 21,848 | 14,521 | 19,738 | 20,035 | 7,145 | 9,084 | 10,109 | 16,637 | 10,692 | 9,842 | 1,889 |
| 36 | 5,380 | 13,172 | 19,677 | 19,346 | 13,394 | 13,942 | 18,044 | 12,723 | 9,563 | 9,647 | 9,641 | 13,339 | 16,996 | 12,648 | 9,900 | 1,593 |
| 37 | 2,260 | 6,014 | 1,251 | 18,274 | 20,377 | 14,112 | 27,518 | 19,149 | 10,180 | 5,595 | 3,139 | 7,219 | 8,805 | 2,537 | 10,812 | 2,171 |
| 38 | 3,264 | 8,779 | 61,222 | 4,012 | – | 425 | 42,800 | 12,857 | 13,788 | 6,492 | 2,813 | 2,379 | 5,654 | 2,455 | 11,280 | 3,824 |
| 39 | 1,873 | 22,150 | 32,323 | – | – | – | 9,474 | 18,121 | 10,382 | 3,009 | 2,519 | 1,354 | 4,156 | 2,095 | 9,452 | 2,244 |
| 40 | 1,091 | 6,171 | 297 | – | – | – | 21,328 | 10,598 | 10,685 | 1,742 | 924 | 902 | – | 2,235 | 5,807 | 1,943 |
| 41 | 1,427 | 1,891 | 2,947 | – | – | – | 3,475 | 3,163 | 2,899 | 1,003 | – | 287 | – | 1,219 | 2,319 | 650 |
| 42 | 6,651 | 342 | 14,630 | – | – | – | – | 411 | – | – | – | – | – | 366 | 2,813 | 1,043 |
| Total | 52,889 | 97,740 | 209,730 | 153,540 | 184,541 | 262,852 | 238,803 | 211,114 | 236,374 | 131,322 | 131,687 | 128,111 | 112,618 | 117,696 | 117,090 | 17,667 |
| Early stk | 15,916 | 23,096 | 47,147 | 43,897 | 89,065 | 172,401 | 80,744 | 80,782 | 116,682 | 96,636 | 81,859 | 68,015 | 27,760 | 56,512 | 44,593 | 10,731 |
| Late stk | 36,973 | 74,644 | 162,583 | 109,643 | 95,476 | 90,451 | 158,059 | 130,331 | 119,692 | 34,633 | 49,828 | 60,096 | 84,858 | 58,949 | 72,418 | 10,038 |

Note: Escapement estimates based on weir counts in 1976 to 1993, and on mark-recapture estimates from fish wheel programs in 1994 to 2004.

Table 12.–Weekly and yearly escapement of Chilkat River mainstem sockeye salmon from 1994 to 2004.

| Stat | Years | | | | | | | | | | | 1994 to 2004 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Week | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | Mean | SE |
| 23 | – | – | – | – | – | – | – | – | – | – | – | – | – |
| 24 | – | 27 | – | 69 | 65 | – | 53 | 51 | 98 | 47 | 81 | 61 | 7 |
| 25 | – | 1,410 | – | 270 | 1,153 | 39 | 309 | 55 | 1,745 | 992 | 288 | 696 | 192 |
| 26 | 137 | 2,867 | 585 | 162 | 3,820 | 431 | 2,222 | 1,294 | 4,917 | 4,051 | 1,662 | 2,014 | 511 |
| 27 | 1,061 | 3,700 | 4,428 | 1,189 | 2,842 | 1,565 | 5,817 | 2,254 | 7,001 | 7,555 | 4,279 | 3,790 | 685 |
| 28 | 3,427 | 3,529 | 12,508 | 1,059 | 2,893 | 5,571 | 8,440 | 2,261 | 6,159 | 5,474 | 6,541 | 5,260 | 972 |
| 29 | 1,434 | 3,116 | 10,239 | 1,433 | 3,312 | 2,671 | 13,472 | 3,145 | 5,068 | 4,330 | 7,002 | 5,020 | 1,146 |
| 30 | 2,242 | 4,283 | 11,416 | 3,277 | 3,335 | 5,001 | 7,805 | 6,645 | 3,966 | 2,684 | 3,789 | 4,949 | 817 |
| 31 | 2,720 | 3,140 | 6,615 | 2,845 | 4,271 | 2,607 | 8,025 | 2,627 | 4,884 | 2,597 | 5,169 | 4,136 | 561 |
| 32 | 3,170 | 1,588 | 5,207 | 2,222 | 1,252 | 2,891 | 4,944 | 2,330 | 2,136 | 3,608 | 6,670 | 3,274 | 509 |
| 33 | 8,431 | 1,229 | 1,036 | 613 | 1,201 | 1,724 | 2,318 | 964 | 1,200 | 1,958 | 3,905 | 2,234 | 677 |
| 34 | 1,882 | 449 | 661 | 371 | 243 | 1,083 | 657 | 209 | 996 | 1,505 | 2,518 | 961 | 223 |
| 35 | 886 | 740 | 398 | 430 | 481 | 257 | 139 | 34 | 432 | 1,071 | 1,890 | 614 | 158 |
| 36 | 691 | – | 217 | 140 | – | 381 | 65 | 29 | 484 | 249 | 899 | 351 | 89 |
| 37 | 105 | – | 59 | 377 | 90 | – | – | 26 | – | – | 104 | 127 | 38 |
| 38 | – | – | – | 180 | – | 133 | – | – | – | – | 52 | 122 | 19 |
| Yearly total[a] | 26,186 | 26,080 | 53,369 | 14,638 | 24,959 | 24,355 | 54,266 | 21,925 | 39,086 | 36,119 | 44,849 | 33,257 | 3,985 |
| Weekly mean | 2,182 | 2,173 | 4,447 | 976 | 1,920 | 1,873 | 4,174 | 1,566 | 3,007 | 2,778 | 3,438 | 2,594 | 328 |

[a] Based on mark-recapture estimates from apportionment of fish wheel captured sockeye salmon by stock through scale pattern analysis

Table 13.–Number of sockeye salmon captured in the lower Chilkat River fish wheels, and marked by temporal strata and size classa, June 12 through October 19, 2004.

| Date | Finclip | Number Captured | Number Marked | | | Proportion Marked |
|---|---|---|---|---|---|---|
| | | | Small | Large | Total | |
| 6/8–6/12 | Adipose fin clip only | 5 | 0 | 5 | 5 | 1.00 |
| 6/13–6/26 | Right axillary appendage clip | 136 | 23 | 101 | 124 | 0.91 |
| 6/27–7/10 | Left axillary appendage clip | 659 | 118 | 483 | 601 | 0.91 |
| 7/11–7/24 | Right ventral fin clip | 701 | 102 | 538 | 640 | 0.91 |
| 7/25–8/7 | Left ventral fin clip | 940 | 198 | 674 | 872 | 0.93 |
| 8/8–8/21 | Right pectoral fin clip | 929 | 246 | 614 | 860 | 0.93 |
| 8/22–9/4 | Left pectoral clip | 689 | 226 | 420 | 646 | 0.94 |
| 9/5–9/18 | Dorsal fin clip | 155 | 35 | 93 | 128 | 0.83 |
| 9/19–10/12 | Right axillary appendage clip | 152 | 35 | 110 | 145 | 0.95 |
| Total | | 4,366 | 983 | 3,038 | 4,021 | 0.92 |

[a] Fish were classified by mid-eye-to-fork length (MEF): 360 mm MEF< small ≤ 515 mm MEF; large > 515 mm MEF.

Table 14.–Number of sockeye salmon inspected for marks and number of marked fish recaptured during mark-recovery surveys in the Chilkat River by site, size class, and sex, 2004.

| Site | Number Inspected, by Size and Sex | | | | | Number Marked, by Size and Sex | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Small | | Large | | | Small | | Large | | |
| Dates | M | F | M | F | Total | M | F | M | F | Total |
| **Chilkat Lake weir** | | | | | | | | | | |
| 7/9–7/10 | 7 | 1 | 52 | 60 | 120 | 0 | 0 | 3 | 0 | 3 |
| 7/11–7/17 | 24 | 9 | 211 | 240 | 484 | 1 | 0 | 1 | 7 | 9 |
| 7/18–7/24 | 24 | 16 | 287 | 350 | 678 | 2 | 0 | 2 | 8 | 12 |
| 7/25–7/31 | 11 | 3 | 156 | 158 | 328 | 0 | 0 | 5 | 6 | 11 |
| 8/1–8/7 | 26 | 13 | 276 | 333 | 649 | 0 | 1 | 4 | 4 | 9 |
| 8/8–8/14 | 38 | 10 | 281 | 371 | 700 | 1 | 0 | 3 | 10 | 14 |
| 8/15–8/21 | 24 | 22 | 184 | 253 | 484 | 1 | 1 | 5 | 18 | 25 |
| 8/22–8/28 | 91 | 64 | 265 | 273 | 693 | 1 | 3 | 10 | 9 | 23 |
| 8/29–9/4 | 84 | 70 | 275 | 301 | 731 | 4 | 2 | 5 | 16 | 27 |
| 9/5–9/11 | 69 | 65 | 333 | 267 | 734 | 2 | 1 | 14 | 8 | 25 |
| 9/12–9/18 | 92 | 181 | 567 | 579 | 1,419 | 1 | 4 | 13 | 12 | 30 |
| 9/19–9/25 | 53 | 137 | 635 | 571 | 1,396 | 3 | 2 | 2 | 6 | 13 |
| 9/26–10/2 | 14 | 48 | 199 | 170 | 431 | 0 | 1 | 3 | 4 | 8 |
| 10/3–10/9 | 27 | 57 | 181 | 191 | 456 | 0 | 1 | 1 | 6 | 8 |
| 10/10–10/11 | 4 | 3 | 59 | 50 | 117 | 0 | 0 | 0 | 1 | 1 |
| Total | 590 | 700 | 3,962 | 4,168 | 9,420 | 16 | 16 | 72 | 117 | 221 |
| **Chilkat River mainstem** | | | | | | | | | | |
| 7/24 | 19 | 7 | 3 | 9 | 38 | 10 | 1 | 1 | 4 | 16 |
| 7/25–7/31 | 54 | 17 | 87 | 90 | 248 | 7 | 0 | 6 | 3 | 16 |
| 8/1–8/7 | 69 | 21 | 84 | 179 | 353 | 0 | 0 | 0 | 2 | 2 |
| 8/8–8/14 | 1 | 2 | 6 | 3 | 12 | 0 | 1 | 2 | 0 | 3 |
| 8/15–8/21 | 44 | 6 | 26 | 59 | 135 | 0 | 0 | 1 | 0 | 1 |
| 8/22–8/28 | 63 | 19 | 50 | 106 | 238 | 1 | 0 | 0 | 2 | 3 |
| 8/29–9/4 | 49 | 11 | 50 | 109 | 219 | 0 | 0 | 3 | 2 | 5 |
| 9/5–9/11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9/12–9/18 | 5 | 5 | 35 | 45 | 90 | 0 | 0 | 1 | 0 | 1 |
| 9/19–9/25 | 204 | 15 | 20 | 79 | 318 | 2 | 0 | 0 | 0 | 2 |
| Total | 508 | 103 | 361 | 679 | 1,651 | 20 | 2 | 14 | 13 | 49 |
| Grand Total | 1,098 | 803 | 4,323 | 4,847 | 11,071 | 36 | 18 | 86 | 130 | 270 |

[a] Fish were classified by mid-eye-to-fork length (MEF): 360 mm MEF< small ≤ 515 mm MEF; large > 515 mm MEF.

Table 15.–Number of marked sockeye salmon released into the lower Chilkat River and recaptured by marking period and recovery site, and number examined for marks at each recovery site by size class, 2004.

| Marking Stratum Dates | No. Marked | Fraction Recovered | Chilkat Lake Weir | Chilkat River Mainstem |
|---|---|---|---|---|
| **Small Fish (360 mm< Small Fish≤ 520 mm mid–eye-to-fork length)** | | | | |
| 6/8–6/12 | 0 | 0.000 | 0 | 0 |
| 6/13–6/26 | 26 | 0.077 | 2 | 0 |
| 6/27–7/10 | 121 | 0.083 | 5 | 5 |
| 7/11–7/24 | 102 | 0.069 | 1 | 6 |
| 7/25–8/7 | 198 | 0.056 | 5 | 6 |
| 8/8–8/21 | 246 | 0.049 | 8 | 4 |
| 8/22–9/4 | 226 | 0.049 | 10 | 1 |
| 9/5–9/18 | 35 | 0.086 | 3 | 0 |
| 9/19–10/12 | 35 | 0.029 | 1 | 0 |
| Examined for marks | | | 1,290 | 611 |
| Fraction marked | | | 0.027 | 0.036 |
| **Large Fish (>520 mm mid-eye-to-fork length)** | | | | |
| 6/8–6/12 | 5 | 0.000 | 0 | 0 |
| 6/13–6/26 | 101 | 0.010 | 0 | 1 |
| 6/27–7/10 | 487 | 0.057 | 19 | 9 |
| 7/11–7/24 | 538 | 0.061 | 24 | 9 |
| 7/25–8/7 | 674 | 0.079 | 50 | 3 |
| 8/8–8/21 | 618 | 0.073 | 40 | 5 |
| 8/22–9/4 | 420 | 0.083 | 35 | 0 |
| 9/5–9/18 | 93 | 0.097 | 9 | 0 |
| 9/19–10/12 | 110 | 0.082 | 9 | 0 |
| Examined for marks | | | 8,126 | 1,040 |
| Fraction marked | | | 0.023 | 0.026 |

Table 16.–Pooled number of sockeye salmon marked by stratum, recovered by marking stratum and recovery area, and examined for marks by recovery area and size class in the Chilkat River drainage, 2004.

| Marking stratum | Number Marked | Fraction Recovered | Chilkat Lake Weir | Chilkat River Mainstem |
|---|---|---|---|---|
| **Small Fish (360 mm< Small Fish≤ 520 mm mid-eye-to-fork length)** | | | | |
| 6/8–7/10 | 147 | 0.082 | 7 | 5 |
| 7/11–8/21 | 546 | 0.055 | 14 | 16 |
| 8/22–10/12 | 296 | 0.051 | 14 | 1 |
| Examined for marks | | | 1,290 | 611 |
| Fraction marked | | | 0.027 | 0.036 |
| **Large Fish (>520 mm mid-eye-to-fork length)** | | | | |
| 6/8–7/10 | 593 | 0.049 | 19 | 10 |
| 7/11–8/21 | 1,830 | 0.072 | 114 | 17 |
| 8/22–10/12 | 623 | 0.085 | 53 | 0 |
| Examined for marks | | | 8,126 | 1,040 |
| Fraction marked | | | 0.023 | 0.026 |

Table 17.–Estimated abundance of sockeye salmon (mid-eye-to-fork length>360 mm) in the Chilkat River drainage, by size class, 2004.

| Size category | Abundance | Standard Error |
|---|---|---|
| Small Fish (≤ 520 mm mid-eye-to-fork length) | 32,464 | 4,038 |
| Large Fish (>520 mm mid-eye-to-fork length) | 130,522 | 8,483 |
| Combined | 162,986 | 9,534 |

Table 18.–Estimated weekly abundance of Chilkat Lake and Chilkat River mainstem sockeye salmon stocks in the Chilkat River drainage, 2004.

| Stat Week | Mid-Date | Weekly Proportion | Weekly Abundance | Chilkat Lake | Chilkat Mainstem | Chilkat Lake Age 1. | Chilkat Lake Age 2. | Chilkat Mainstem Age 0. | Chilkat Mainstem Age 1. |
|---|---|---|---|---|---|---|---|---|---|
| 24 | 9-Jun | 0.001 | 163 | 81 | 81 | 0.50 | 0.00 | 0.00 | 0.50 |
| 25 | 16-Jun | 0.009 | 1,438 | 1,150 | 288 | 0.40 | 0.40 | 0.15 | 0.05 |
| 26 | 23-Jun | 0.025 | 4,104 | 2,441 | 1,662 | 0.56 | 0.04 | 0.09 | 0.32 |
| 27 | 30-Jun | 0.062 | 10,036 | 5,757 | 4,279 | 0.49 | 0.08 | 0.32 | 0.11 |
| 28 | 7-Jul | 0.089 | 14,586 | 8,046 | 6,541 | 0.51 | 0.04 | 0.33 | 0.11 |
| 29 | 14-Jul | 0.091 | 14,912 | 7,909 | 7,002 | 0.49 | 0.04 | 0.37 | 0.10 |
| 30 | 21-Jul | 0.069 | 11,214 | 7,426 | 3,789 | 0.59 | 0.08 | 0.27 | 0.07 |
| 31 | 28-Jul | 0.081 | 13,205 | 7,984 | 5,169 | 0.55 | 0.06 | 0.23 | 0.16 |
| 32 | 4-Aug | 0.137 | 22,388 | 15,718 | 6,670 | 0.50 | 0.21 | 0.17 | 0.13 |
| 33 | 11-Aug | 0.111 | 18,121 | 14,216 | 3,905 | 0.41 | 0.37 | 0.11 | 0.10 |
| 34 | 18-Aug | 0.104 | 16,984 | 14,305 | 2,518 | 0.27 | 0.57 | 0.05 | 0.10 |
| 35 | 25-Aug | 0.078 | 12,636 | 10,692 | 1,890 | 0.17 | 0.68 | 0.03 | 0.12 |
| 36 | 1-Sep | 0.084 | 13,611 | 12,648 | 899 | 0.16 | 0.77 | 0.01 | 0.05 |
| 37 | 8-Sep | 0.016 | 2,641 | 2,537 | 104 | 0.10 | 0.86 | 0.02 | 0.02 |
| 38 | 15-Sep | 0.016 | 2,560 | 2,455 | 52 | 0.04 | 0.92 | 0.00 | 0.02 |
| 39 | 22-Sep | 0.013 | 2,153 | 2,095 | 0 | 0.08 | 0.89 | 0.00 | 0.00 |
| 40 | 29-Sep | 0.014 | 2,235 | 2,235 | 0 | 0.05 | 0.95 | 0.00 | 0.00 |
| 41 | 6-Oct | 0.007 | 1,219 | 1,219 | 0 | 0.06 | 0.94 | 0.00 | 0.00 |
| 42 | 13-Oct | 0.002 | 366 | 366 | 0 | 0.06 | 0.94 | 0.00 | 0.00 |
| Total | | | 162,986 | 115,462 | 44,849 | | | | |

Table 19.–Number of chum salmon captured in the lower Chilkat River, and marked by temporal strata, 2003.

| Date | Finclip | Number captured | Number marked | Proportion marked |
|---|---|---|---|---|
| 7/15–7/26 | Right ventral fin clip | 16 | 15 | 0.94 |
| 7/27–8/23 | Left ventral fin clip | 62 | 61 | 0.98 |
| 8/24–9/6 | Right pectoral fin clip | 410 | 404 | 0.99 |
| 9/7–9/20 | Left pectoral clip | 817 | 716 | 0.88 |
| 9/21–10/4 | Dorsal fin clip | 956 | 744 | 0.78 |
| 10/5–10/18 | Right axillary fin clip | 742 | 709 | 0.96 |
| 10/19–10/21 | Left axillary fin clip | 843 | 753 | 0.89 |
| Total | | 3,846 | 3,402 | 0.88 |

Table 20.–Number of chum salmon inspected for marks and number of marked fish recaptured during recovery surveys in the Chilkat River drainage, 2003.

| Dates | Number Inspected | Number Marked | Fraction Marked |
|---|---|---|---|
| 9/12–9/13 | 100 | 15 | 0.15 |
| 9/14–9/20 | 136 | 9 | 0.07 |
| 9/21–9/27 | 452 | 17 | 0.04 |
| 9/28–10/4 | 329 | 2 | 0.01 |
| 10/5–10/11 | 716 | 14 | 0.02 |
| 10/12–10/18 | 362 | 3 | 0.01 |
| 10/19–10/25 | 600 | 9 | 0.02 |
| 10/26–11/1 | 1,340 | 19 | 0.01 |
| 11/2–11/8 | 493 | 4 | 0.01 |
| Total | 4,528 | 92 | 0.02 |

Table 21.–Comparisons of peak aerial counts, fish wheel catches and mark-recapture abundance estimates for Chilkat River drainage chum salmon, 2002–2004.

| | Drainage wide | Total | Drainage wide | | Ratios | | | |
|---|---|---|---|---|---|---|---|---|
| | Peak Aerial | Fish Wheel | Mark-Recap. (M-R) | | M-R/ Peak | M-R/Fish | Peak Aerial | Fish Wheel |
| Year | Count | Catch | Estimate | SE | Aerial Ct. | Wheel Ctch. | Count/M-R | Catch/M-R |
| 2002 | 63,566[a] | 4,217 | 205,779 | 22,088 | 3.2 | 48.8 | 0.31 | 0.02 |
| 2003 | 46,910[b] | 3,846 | 165,721 | 16,684 | 3.5 | 43.1 | 0.28 | 0.02 |
| 2004 | 60,606[c] | 4,266 | 328,577 | 20,426 | 5.4 | 77.0 | 0.18 | 0.01 |
| Average | 57,027 | 4,110 | 233,359 | 19,733 | 4.1 | 56.8 | 0.26 | 0.02 |

[a] Peak counting dates were; Chilkat River (November 1), Klehini River (September 25) and Herman Creek (September 17).
[b] Peak counting dates were; Chilkat River (October 27), Klehini River (September 25) and Herman Creek (September 30).
[c] Peak counting dates were; Chilkat River (October 25), Klehini River (October 12) and Herman Creek (September 20).

Table 22.–Number of chum salmon captured in the lower Chilkat River, and marked by temporal strata, 2004.

| Date | Finclip | Number captured | Number marked | Proportion marked |
|---|---|---|---|---|
| 7/8–7/24 | Right ventral fin clip | 36 | 35 | 0.972 |
| 7/25–8/7 | Left ventral fin clip | 127 | 126 | 0.992 |
| 8/8–8/21 | Right pectoral fin clip | 536 | 530 | 0.989 |
| 8/22–9/4 | Left pectoral clip | 1497 | 1494 | 0.998 |
| 9/5–9/18 | Dorsal fin clip | 682 | 681 | 0.999 |
| 9/19–10/2 | Right axillary fin clip | 851 | 847 | 0.995 |
| 10/3–10/19 | Left axillary fin clip | 537 | 536 | 0.998 |
| Total | | 4,266 | 4,249 | 0.996 |

Table 23.–Number of chum salmon inspected for marks and number of marked fish recaptured during recovery surveys in the Chilkat River drainage, 2004.

| Dates | Number Inspected | Number Marked | Fraction Marked |
|---|---|---|---|
| 8/25–8/28 | 80 | 2 | 0.025 |
| 8/29–9/4 | 150 | 8 | 0.055 |
| 9/5–9/11 | 706 | 40 | 0.057 |
| 9/12–9/18 | 254 | 21 | 0.081 |
| 9/19–9/25 | 1,112 | 24 | 0.022 |
| 9/26–10/2 | 1,810 | 45 | 0.025 |
| 10/3–10/9 | 2,215 | 23 | 0.010 |
| 10/10–10/16 | 4,361 | 30 | 0.007 |
| 10/17–10/23 | 4,347 | 31 | 0.007 |
| 10/24–10/30 | 3,375 | 13 | 0.004 |
| 10/31–11/2 | 144 | 2 | 0.014 |
| Total | 18,410 | 239 | 0.01 |

Table 24.–Estimated age composition of sockeye salmon sampled in the Chilkat River drainage in 2003, stratified by size.

| | Brood Year and Age Class | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2000 | | 1999 | | | 1998 | | | 1997 | | | 1996 | Total |
| | 0.2 | 1.1 | 0.3 | 1.2 | 2.1 | 0.4 | 1.3 | 2.2 | 1.4 | 2.3 | 3.2 | 3.3 | Aged |
| **Small Fish (>360 mm and ≤520 mm MEF[a])** | | | | | | | | | | | | | |
| Sample size | 226 | 8 | 27 | 142 | 7 | 0 | 49 | 336 | 1 | 90 | 12 | 0 | 898 |
| Percent | 8.3 | 0.3 | 1.0 | 5.2 | 0.3 | 0 | 1.8 | 12.3 | 0.0 | 3.3 | 0.4 | 0 | 32.9 |
| Percent SE | 0.5 | 0.1 | 0.2 | 0.4 | 0.1 | 0 | 0.3 | 0.6 | 0.0 | 0.3 | 0.1 | 0 | 0.9 |
| **Large Fish (>520 mm MEF)** | | | | | | | | | | | | | |
| Sample size | 13 | 0 | 232 | 30 | 0 | 1 | 374 | 176 | 2 | 995 | 10 | 1 | 1,834 |
| Percent | 0.5 | 0 | 8.5 | 1.1 | 0 | 0.0 | 13.7 | 6.4 | 0.1 | 36.4 | 0.4 | 67.1 | 67.1 |
| Percent SE | 0.1 | 0 | 0.5 | 0.2 | 0 | 0.0 | 0.7 | 0.5 | 0.1 | 0.9 | 0.1 | 0 | 0.9 |
| **Combined** | | | | | | | | | | | | | |
| Sample size | 239 | 8 | 259 | 172 | 7 | 1 | 423 | 512 | 3 | 1,085 | 22 | 1 | 2,732 |
| Percent | 8.7 | 0.3 | 9.5 | 6.3 | 0.3 | 0.0 | 15.5 | 18.7 | 0.1 | 39.7 | 0.8 | 0.0 | 100.0 |
| Percent SE | 0.5 | 0.1 | 0.6 | 0.5 | 0.1 | 0.0 | 0.7 | 0.7 | 0.1 | 0.9 | 0.2 | 0.0 | 0.0 |

[a] MEF is length measured from middle of eye to fork of tail.

Table 25.–Estimated abundance of sockeye salmon in the Chilkat River drainage in 2003, by age and sex, stratified by size.

| | Brood Year and Age Class | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2000 | | 1999 | | | 1998 | | | 1997 | | | 1996 | Est. |
| | 0.2 | 1.1 | 0.3 | 1.2 | 2.1 | 0.4 | 1.3 | 2.2 | 1.4 | 2.3 | 3.2 | 3.3 | Total |
| **Small Fish (>360 mm and ≤520 mm MEF[a])** | | | | | | | | | | | | | |
| Male | 10,584 | 439 | 603 | 4,881 | 384 | 0 | 932 | 4,716 | 55 | 1,371 | 55 | 0 | 24,020 |
| Standard Error | 1,047 | 158 | 186 | 614 | 147 | 0 | 234 | 600 | 55 | 289 | 55 | 0 | 1,995 |
| Female | 1,810 | 0 | 877 | 2,907 | 0 | 0 | 1,755 | 13,710 | 0 | 3,565 | 603 | 0 | 25,227 |
| Standard Error | 338 | 0 | 227 | 445 | 0 | 0 | 332 | 1,272 | 0 | 503 | 186 | 0 | 2,079 |
| Total Small | 12,394 | 439 | 1,481 | 7,787 | 384 | 0 | 2,687 | 18,427 | | 4,936 | 658 | 0 | 40,606 |
| Standard Error | 1,178 | 158 | 302 | 840 | 147 | 0 | 424 | 1,605 | 55 | 618 | 195 | 0 | 3,729 |
| **Large Fish (>520 mm MEF)** | | | | | | | | | | | | | |
| Male | 548 | 0 | 4,716 | 768 | 0 | 0 | 7,678 | 3,565 | 55 | 21,278 | 219 | 0 | 38,828 |
| Standard Error | 177 | 0 | 600 | 211 | 0 | 0 | 832 | 503 | | 1,804 | 110 | 0 | 3,016 |
| Female | 165 | 0 | 8,007 | 877 | 0 | 55 | 12,833 | 6,087 | 55 | 33,289 | 329 | 55 | 61,696 |
| Standard Error | 95 | 0 | 857 | 227 | 0 | 55 | 1,209 | 710 | 55 | 2,635 | 136 | 55 | 4,584 |
| Total Large | 713 | 0 | 12,723 | 1,645 | 0 | 55 | 20,511 | 9,652 | 110 | 54,567 | 548 | 55 | 100,524 |
| Standard Error | 203 | 0 | 1,201 | 320 | 0 | 55 | 1,751 | 979 | 78 | 4,093 | 177 | 0 | 7,231 |
| **Combined** | | | | | | | | | | | | | |
| Male | 11,133 | 439 | 5,320 | 5,649 | 384 | 0 | 8,610 | 8,281 | 110 | 22,649 | 274 | 0 | 62,848 |
| Standard Error | 1,087 | 158 | 649 | 675 | 147 | 0 | 902 | 877 | 78 | 1,900 | 124 | 0 | 4,659 |
| Female | 1,974 | 0 | 8,884 | 3,784 | 0 | 55 | 14,588 | 19,798 | 55 | 36,853 | 932 | 55 | 86,923 |
| Standard Error | 355 | 0 | 922 | 522 | 0 | 55 | 1,334 | 1,701 | 55 | 2,880 | 234 | 55 | 6,304 |
| All fish | 13,107 | 439 | 14,204 | 9,433 | 384 | 55 | 23,198 | 28,079 | 165 | 59,503 | 1,20 | 55 | 149,771 |
| Standard Error | 1,229 | 158 | 1,307 | 963 | 147 | 55 | 1,938 | 2,276 | 95 | 4,430 | 269 | 55 | 10,584 |

[a] MEF is length measured from middle of eye to fork of tail.

Table 26.–Estimated age composition of sockeye salmon sampled in the Chilkat River drainage in 2004, stratified by size.

| | Brood Year and Age Class | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2001 | | 2000 | | | 1999 | | 1998 | | | 1997 | | Total |
| | 0.2 | 1.1 | 0.3 | 1.2 | 2.1 | 1.3 | 2.2 | 1.4 | 2.3 | 3.2 | 2.4 | 3.3 | |
| **Small Fish** | **(>360 mm and ≤515 mm MEF[a] )** | | | | | | | | | | | | |
| Sample | 1.3 | 10. | 18 | 175 | 11 | 41 | 329 | 0 | 19 | 2 | 0 | 1 | 731 |
| Pecent | 0.2 | 0.5 | 0.6 | 5.4 | 0.3 | 1.3 | 10.2 | 0.0 | 0.6 | 0.1 | 0 | 0.0 | 22.7 |
| SE | 41 | 32 | 0.1 | 0.4 | 0.1 | 0.2 | 0.5 | 0.0 | 0.1 | 0.0 | 0 | 0.0 | 0.7 |
| **Large Fish** | **(>515 mm MEF)** | | | | | | | | | | | | |
| Sample | 5 | 0 | 412 | 85 | 0 | 1,303 | 210 | 3 | 467 | 0 | 2 | 6 | 2,493 |
| Pecent | 0.2 | 0.0 | 12.8 | 2.6 | 0.0 | 40.4 | 6.5 | 0.1 | 14.5 | 0.0 | 0.1 | 0.2 | 77.3 |
| SE | 0.1 | 0.0 | 0.6 | 0.3 | 0 | 0.9 | 0.4 | 0.1 | 0.6 | 0.0 | 0.0 | 0.1 | 0.7 |
| **Combined** | | | | | | | | | | | | | |
| Sample | 137 | 3 | 430 | 260 | 11 | 1,344 | 539 | 3 | 486 | 2 | 2 | 7 | 3,224 |
| Pecent | 4.2 | 0.1 | 13.3 | 8.1 | 0.3 | 41.7 | 16.7 | 0.1 | 15.1 | 0.1 | 0.1 | 0.2 | 100.0 |
| SE | 0.4 | 0.1 | 0.6 | 0.5 | 0.1 | 0.9 | 0.7 | 0.1 | 0.6 | 0.0 | 0.0 | 0.1 | 0.0 |

[a] MEF is length measured from middle of eye to fork of tail.

Table 27.–Estimated abundance of sockeye salmon in the Chilkat River drainage in 2004, by age and sex, stratified by size.

| | Brood Year and Age Class | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2001 | | 2000 | | | 1999 | | 1998 | | | 1997 | | Total |
| | 0.2 | 1.1 | 0.3 | 1.2 | 2.1 | 1.3 | 2.2 | 1.4 | 2.3 | 3.2 | 2.4 | 3.3 | |
| **Small Fish** | **(>360 mm and ≤515 mm MEF[a] )** | | | | | | | | | | | | |
| **Male** | 5,66 | 152 | 506 | 4,904 | 556 | 910 | 6,066 | 0 | 556 | 0 | 101 | 51 | 19,463 |
| SE | 618 | 88 | 162 | 565 | 170 | 220 | 645 | 0 | 170 | 0 | 72 | 51 | 1,456.9 |
| **Female** | 1,01 | 0 | 404 | 3,943 | 0 | 1,163 | 10,566 | 0 | 404 | 101 | 0 | 0 | 17,593 |
| SE | 232 | 0 | 144 | 496 | 0 | 250 | 932 | 0 | 144 | 72 | 0 | 0 | 1,349 |
| **All small** | 6,67 | 152 | 910 | 8,847 | 556 | 2,073 | 16,632 | 0 | 961 | 101 | 101 | 51 | 37,056 |
| SE | 686 | 88 | 220 | 826 | 170 | 343 | 1,293 | 0 | 226 | 72 | 0 | 51 | 4,038 |
| **Large Fish** | **(>515 mm MEF)** | | | | | | | | | | | | |
| **Male** | 152 | 0 | 7,229 | 2,022 | 0 | 26,339 | 4,044 | 101 | 10,414 | 0 | 51 | 152 | 50,503 |
| SE | 88 | 0 | 722 | 338 | 0 | 1,849 | 503 | 72 | 923 | 0 | 51 | 88 | 3,199 |
| **Female** | 101 | 0 | 13,599 | 2,275 | 0 | 39,533 | 6,572 | 51 | 13,195 | 0 | 51 | 152 | 75,528 |
| SE | 5 | 0 | 708 | 118 | 0 | 2,058 | 342 | 3 | 687 | 0 | 3 | 8 | 3,931 |
| **All large** | 253 | 0 | 20,828 | 4,297 | 0 | 65,872 | 10,616 | 152 | 23,609 | 0 | 101 | 303 | 126,031 |
| SE | 13 | 0 | 1,199 | 246 | 0 | 3,796 | 611 | 7 | 1,360 | 0 | 4 | 16 | 7,265 |
| **Combined** | | | | | | | | | | | | | |
| **Male** | 5,81 | 152 | 7,735 | 6,926 | 556 | 27,249 | 10,111 | 101 | 10,970 | 0 | 152 | 202 | 69,613 |
| SE | 628 | 88 | 755 | 703 | 170 | 1,900 | 904 | 72 | 957 | 0 | 88 | 102 | 3,515 |
| **Female** | 1,11 | 0 | 14,003 | 6,218 | 0 | 40,696 | 17,138 | 51 | 13,599 | 101 | 51 | 152 | 93,120 |
| SE | 244 | 0 | 1,140 | 656 | 0 | 2,655 | 1,323 | 51 | 1,116 | 72 | 51 | 88 | 4,156 |
| **All fish** | 6,92 | 152 | 21,738 | 13,144 | 556 | 67,945 | 27,249 | 152 | 24,569 | 101 | 202 | 354 | 162,531 |
| SE | 703 | 88 | 1,587 | 1,088 | 170 | 4,164 | 1,900 | 88 | 1,748 | 72 | 102 | 135 | 5,443 |

[a] MEF is length measured from middle of eye to fork of tail.

Table 28.–Estimated age composition of chum salmon captured in the Chilkat River fish wheels in 2003, stratified by sex.

| | Brood Year and Age Class | | | | | | |
|---|---|---|---|---|---|---|---|
| | 2000 | 1999 | 1998 | 1997 | 1996 | Total | Total |
| | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | Aged | Sampled |
| **Male** | | | | | | | |
| Sample size | 117 | 1,055 | 191 | 2 | 1 | 1,366 | 1,828 |
| Percent | 4.6 | 41.6 | 7.5 | 0.1 | 0.0 | 53.8 | |
| Percent Standard Error | 0.4 | 1.0 | 0.5 | 0.1 | 0.0 | 1.0 | |
| **Female** | | | | | | | |
| Sample size | 69 | 948 | 150 | 6 | 0 | 1,173 | 1,575 |
| Percent | 2.7 | 37.3 | 5.9 | 0.2 | 0.0 | 46.2 | |
| Percent Standard Error | 0.3 | 1.0 | 0.5 | 0.1 | 0.0 | 1.0 | |
| **Combined** | | | | | | | |
| Sample size | 186 | 2,003 | 341 | 8 | 1 | 2,539 | 3,403 |
| Percent | 7.3 | 78.9 | 13.4 | 0.3 | 0.0 | 100.0 | |
| Percent Standard Error | 0.5 | 0.8 | 0.7 | 0.1 | 0.0 | 0.0 | |

Table 29.–Average length at age for Chilkat River chum salmon sampled from the Chilkat River fish wheels in 2003, stratified by sex.

| | Brood year and age class | | | | | | |
|---|---|---|---|---|---|---|---|
| | 2000 | 1999 | 1998 | 1997 | 1996 | Total | Total |
| | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | Aged | Sampled |
| **Male** | | | | | | | |
| Sample size | 117 | 1,055 | 191 | 2 | 1 | 1,366 | 2,538 |
| Average length | 571 | 619 | 660 | 725 | 750 | 621 | |
| Standard Deviation | 3 | 1 | 3 | 26 | 0 | 42 | |
| **Female** | | | | | | | |
| Sample size | 69 | 948 | 150 | 6 | 0 | 1,173 | 1,175 |
| Average length | 565 | 599 | 631 | 623 | 0 | 603 | |
| Standard Deviation | 68 | 20 | 52 | 255 | 0 | 35 | |
| **Combined** | | | | | | | |
| Sample size | 186 | 2,003 | 341 | 8 | 1 | 2,539 | 3,713 |
| Average length | 568 | 609 | 646 | 648 | 750 | 611 | |
| Standard Deviation | 14 | 45 | 18 | 3 | 0 | 55 | |

Table 30.–Estimated abundance by age of chum salmon in the Chilkat River in 2003, stratified by sex. .

| | Brood year and age class | | | | | |
|---|---|---|---|---|---|---|
| | 1999 | 1998 | 1997 | 1996 | 1995 | |
| | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | Total |
| **Male** | 7,637 | 68,860 | 12,467 | 131 | 65 | 89,159 |
| Standard Error | 1,030 | 7,118 | 1,523 | 93 | 65 | 9,117 |
| **Female** | 4,504 | 61,876 | 9,791 | 392 | 0 | 76,562 |
| Standard Error | 683 | 6,429 | 1,254 | 165 | 0 | 7,879 |
| **Combined** | 12,140 | 130,736 | 22,257 | 522 | 65 | 165,721 |
| Standard Error | 1,490 | 13,229 | 2,503 | 191 | 65 | 16,684 |

Table 31.–Estimated age composition of chum salmon captured in the Chilkat River fish wheels in 2004, stratified by sex.

| | Brood year and age class | | | | |
|---|---|---|---|---|---|
| | 2001 | 2000 | 1999 | Total | Total |
| | 0.2 | 0.3 | 0.4 | Aged | Sampled |
| **Male** | | | | | |
| Sample size | 39 | 1,068 | 276 | 1,383 | 2,278 |
| Percent | 1.50 | 41.08 | 10.62 | 53.19 | |
| Percent Standard Error | 0.24 | 0.97 | 0.60 | 0.98 | |
| **Female** | | | | | |
| Sample size | 20 | 960 | 237 | 1,217 | 1,970 |
| Percent | 0.77 | 36.92 | 9.12 | 46.81 | |
| Percent Standard Error | 0.17 | 0.95 | 0.57 | 0.98 | |
| **Combined** | | | | | |
| Sample size | 59 | 2,028 | 513 | 2,600 | 4,248 |
| Percent | 2.27 | 78.00 | 19.73 | 100.00 | |
| Percent Standard Error | 0.29 | 0.81 | 0.78 | 0.00 | |

Table 32.–Average length at age for Chilkat River chum salmon sampled from the Chilkat River fish wheels in 2004, stratified by sex.

| | Brood year and age class | | | | |
|---|---|---|---|---|---|
| | 2001 | 2000 | 1999 | Total | Total |
| | 0.2 | 0.3 | 0.4 | measured | sampled |
| **Male** | | | | | |
| Sample size | 39 | 1,068 | 276 | 1,383 | 2,278 |
| Average length | 610 | 630 | 651 | 634 | |
| Standard Deviation | 30 | 33 | 37 | 35 | |
| **Female** | | | | | |
| Sample size | 20 | 960 | 237 | 1,217 | 1,970 |
| Average length | 596 | 616 | 635 | 619 | |
| Standard Deviation | 16 | 31 | 38 | 33 | |
| **Combined** | | | | | |
| Sample size | 59 | 2,028 | 513 | 2,600 | 4,248 |
| Average length | 606 | 623 | 643 | 627 | |
| Standard Deviation | 27 | 33 | 39 | 35 | |

Table 33.–Estimated abundance by age of chum salmon in the Chilkat River in 2004, stratified by sex.

| | Brood year and age class | | | |
|---|---|---|---|---|
| | 2001 | 2000 | 1999 | |
| | 0.2 | 0.3 | 0.4 | Total |
| **Male** | | | | |
| Abundance | 4,929 | 134,969 | 34,880 | 174,778 |
| Standard Error | 840 | 8,967 | 2,937 | 11,329 |
| **Female** | | | | |
| Abundance | 2,528 | 121,321 | 29,951 | 153,799 |
| Standard Error | 584 | 8,156 | 2,626 | 10,085 |
| **Combined** | | | | |
| Abundance | 7,456 | 256,290 | 64,831 | 328,577 |
| Standard Error | 1,064 | 16,154 | 4,775 | 20,426 |

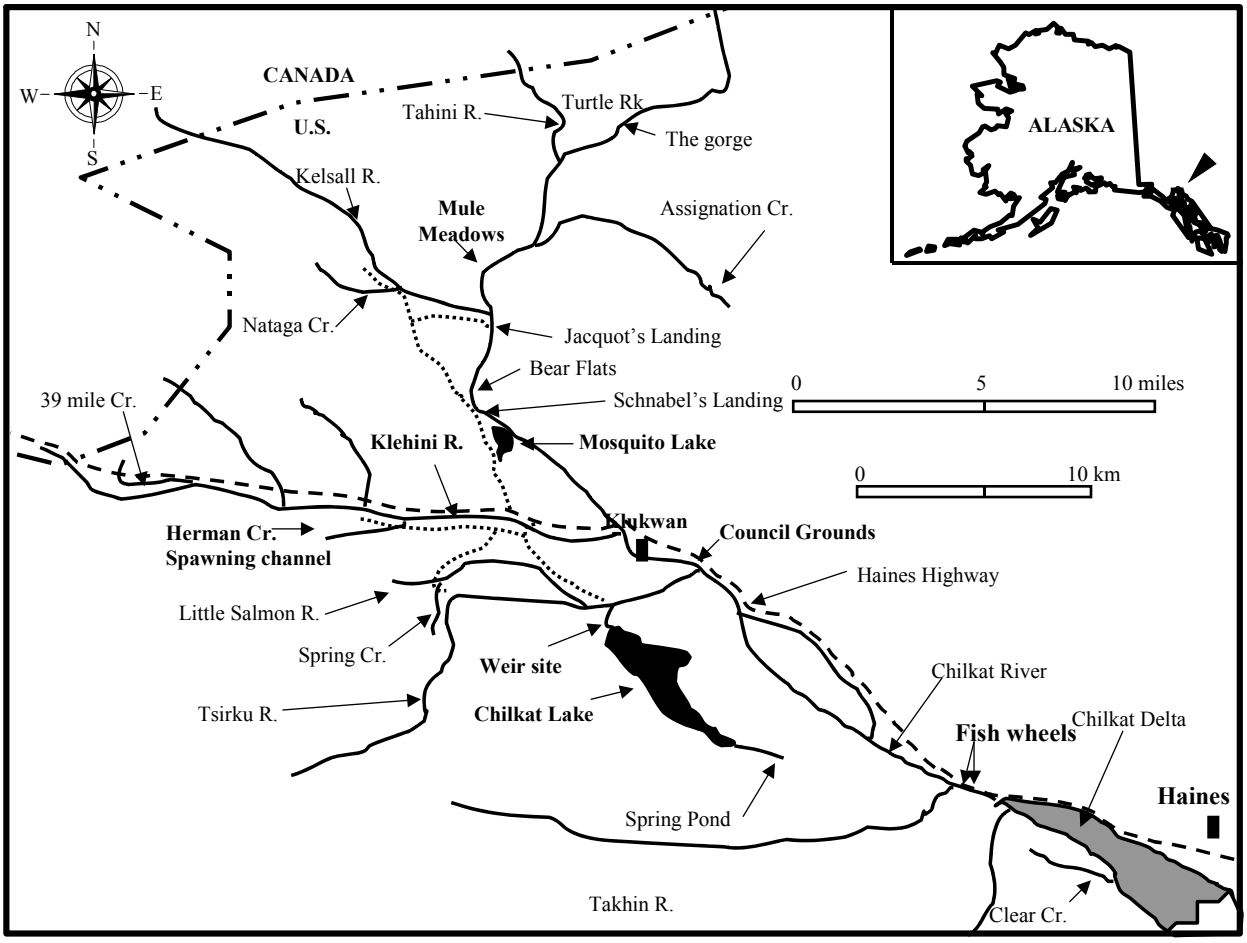



Figure 1.–The Chilkat River drainage, showing location of sampling sites.

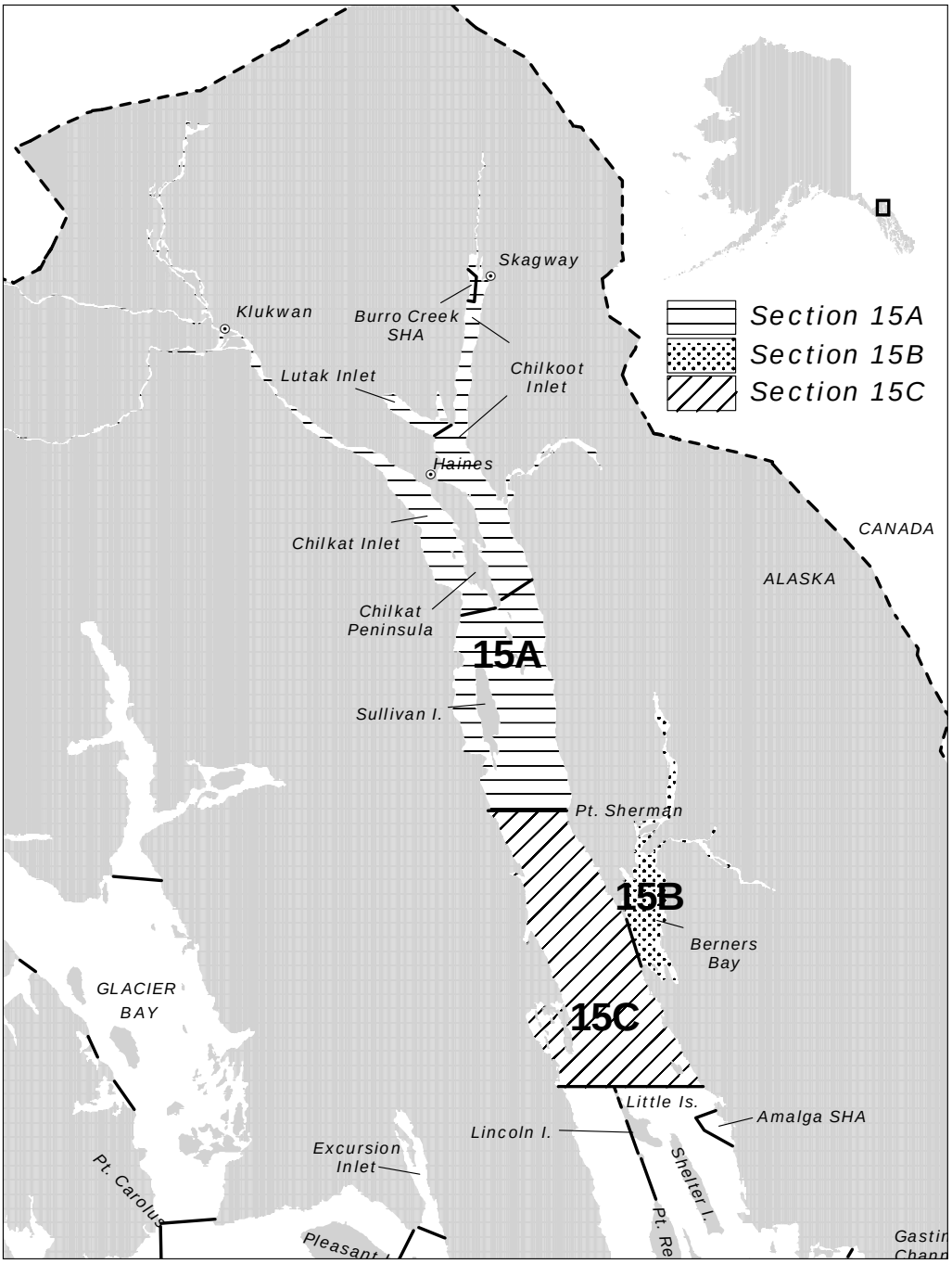



Figure 2.–Sections within District 15 includes all areas north of the latitude of Little Island.

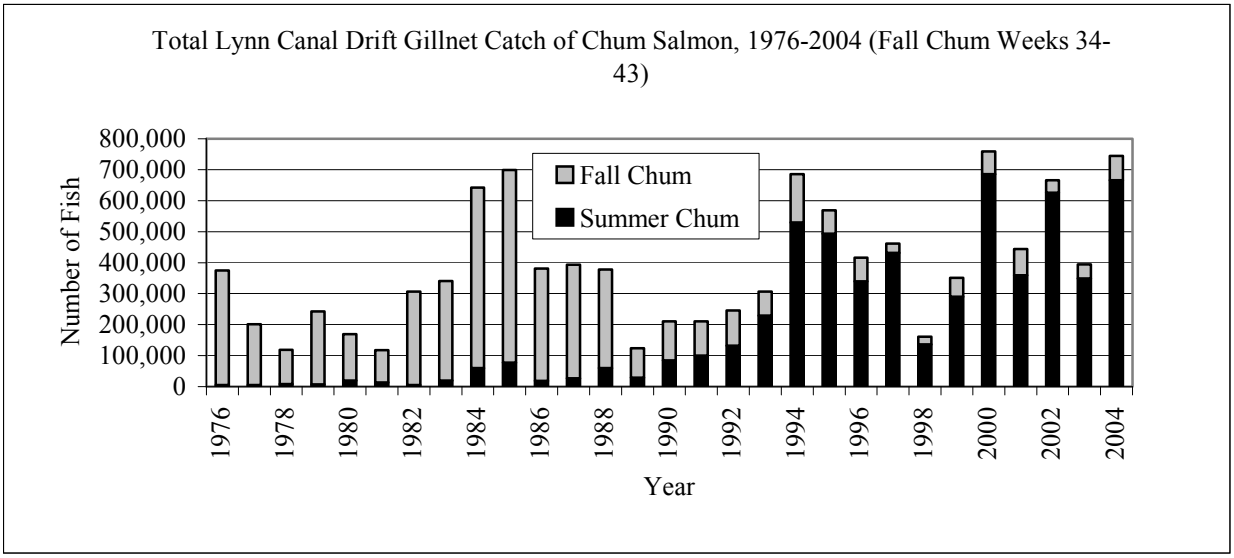



Figure 3.–Summer and fall chum salmon harvests in the Lynn Canal (District 15) drift gillnet fishery, 1976–2004.

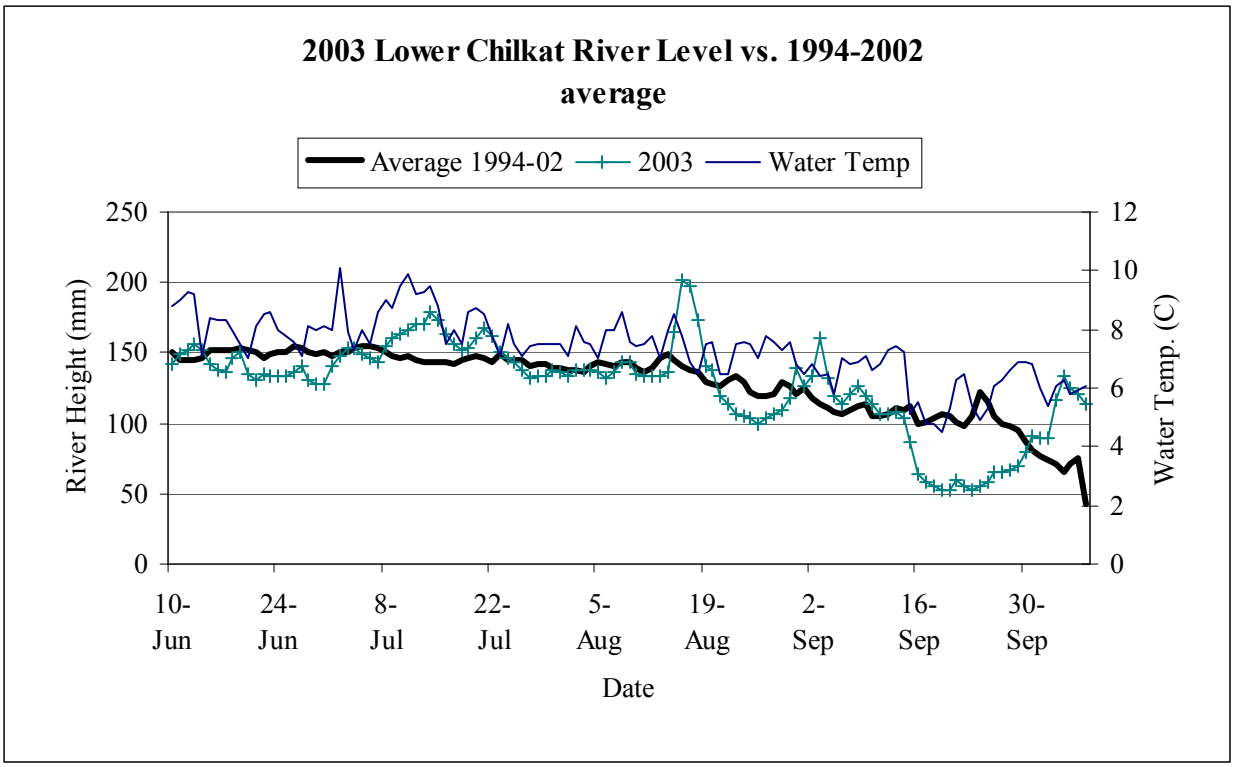



Figure 4.–2003 water level and temperature measurements of the Chilkat River compared to the 1994 to 2002 average water level.

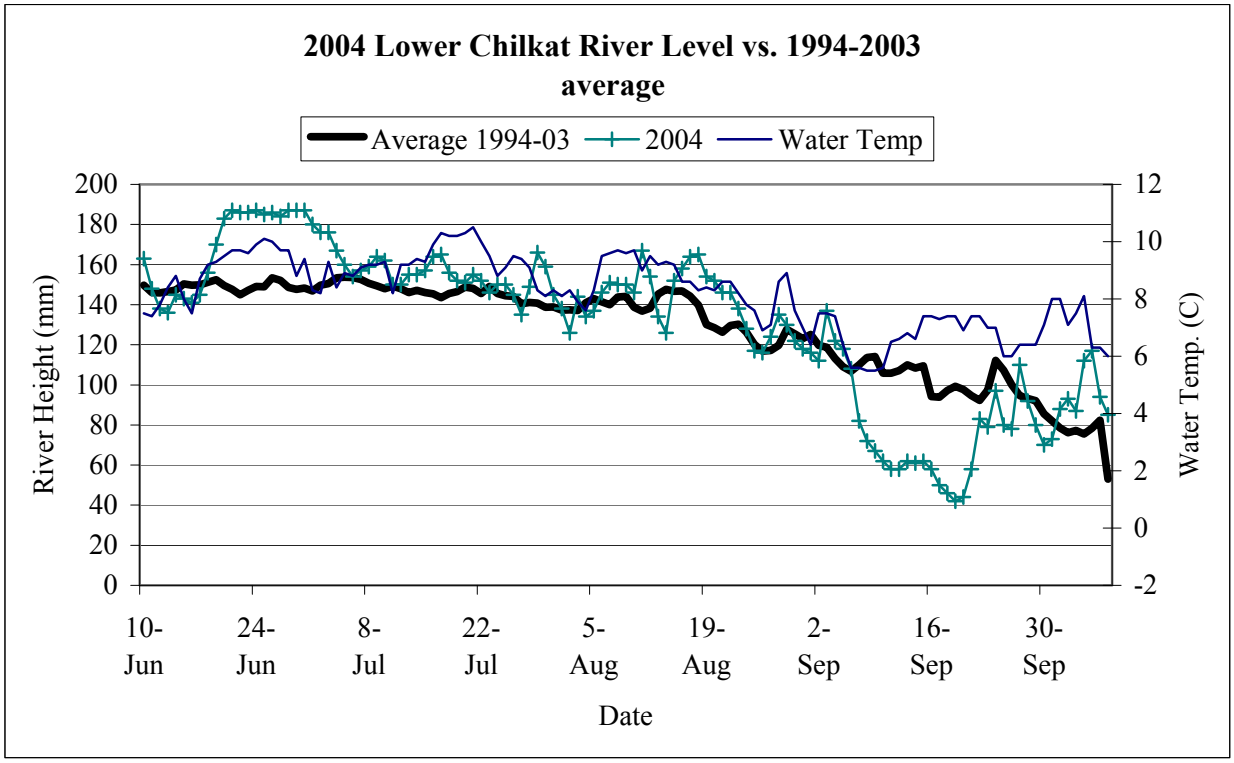
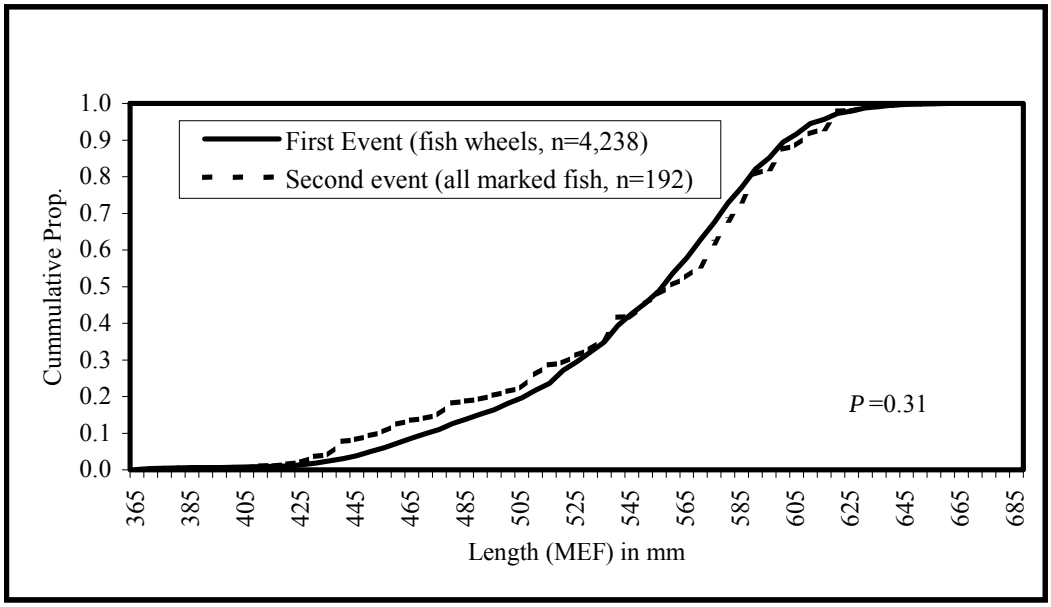



Figure 5.–2004 water level and temperature measurements of the Chilkat River compared to the 1994 to 2003 average water level.



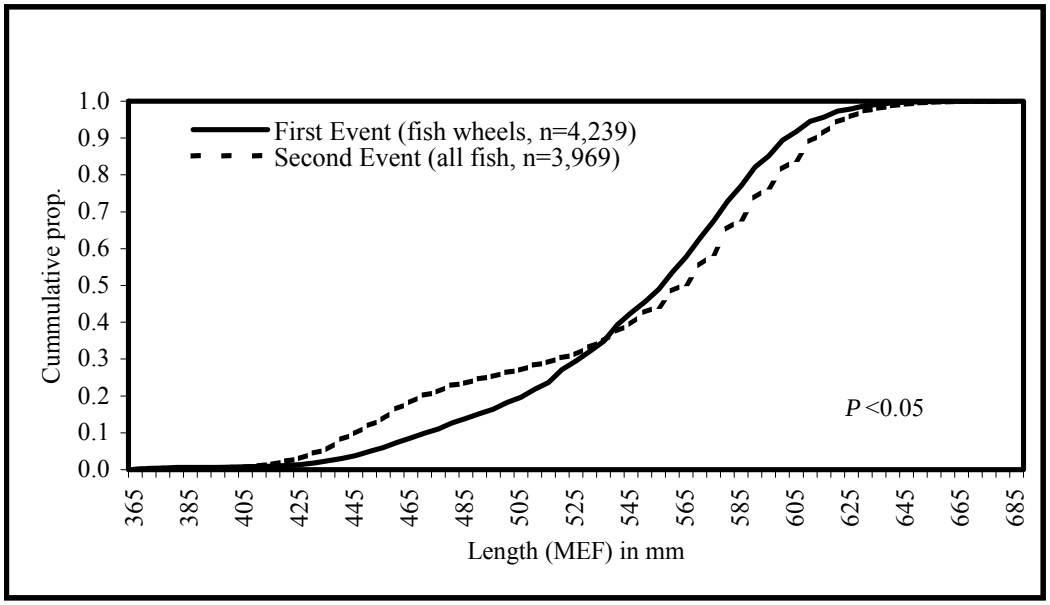




Figure 6.–Cumulative distribution functions of lengths of sockeye salmon marked in the lower Chilkat River, compared to lengths of marked fish recaptured on spawning grounds (top) and compared to lengths of fish examined for marks during recovery events (bottom), 2003.

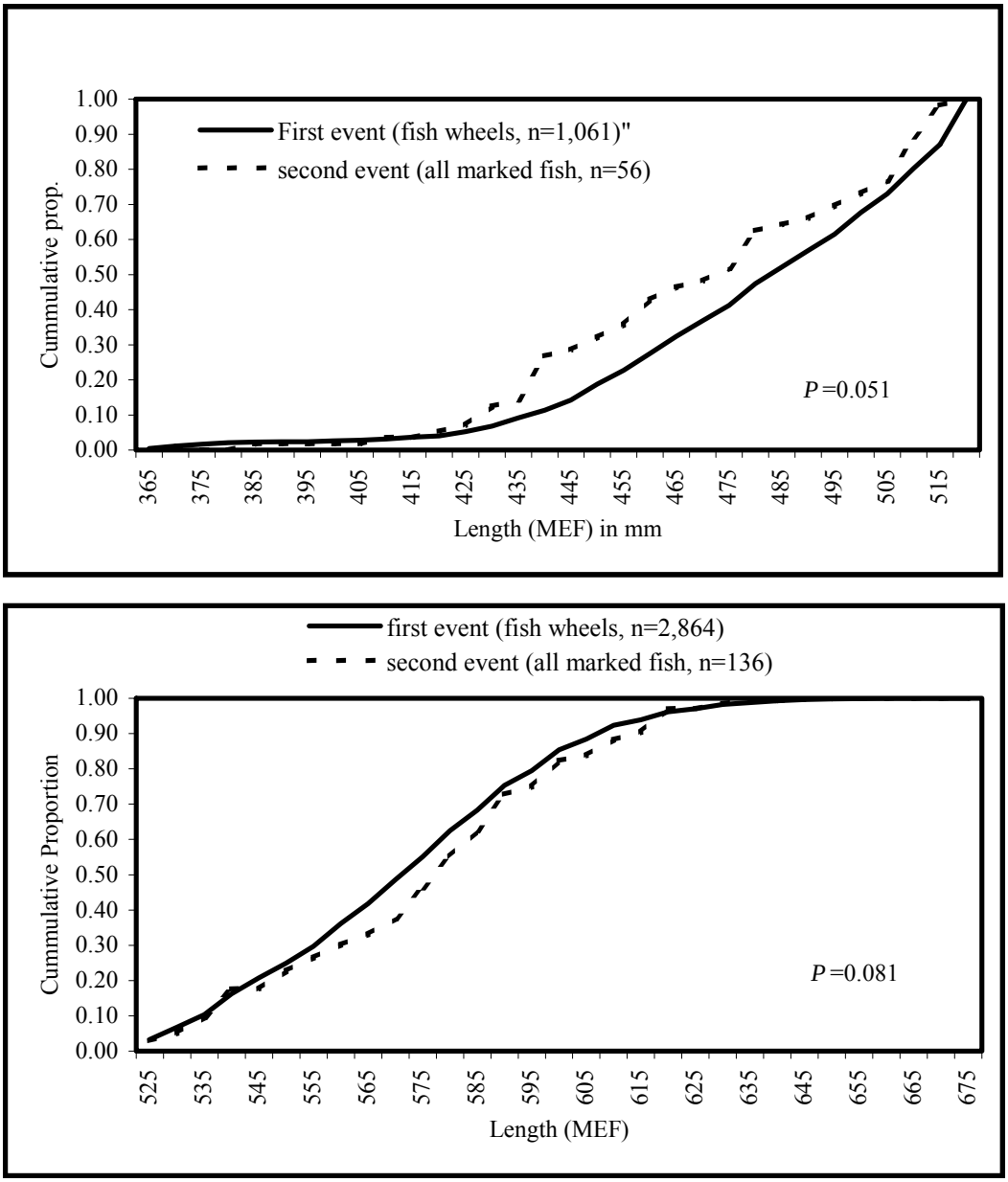



Figure 7.–Cumulative distribution function (CDF) of MEF lengths of small (top) and large (bottom) sockeye salmon marked in the lower Chilkat River versus lengths of marked fish recaptured on the spawning grounds, 2003.

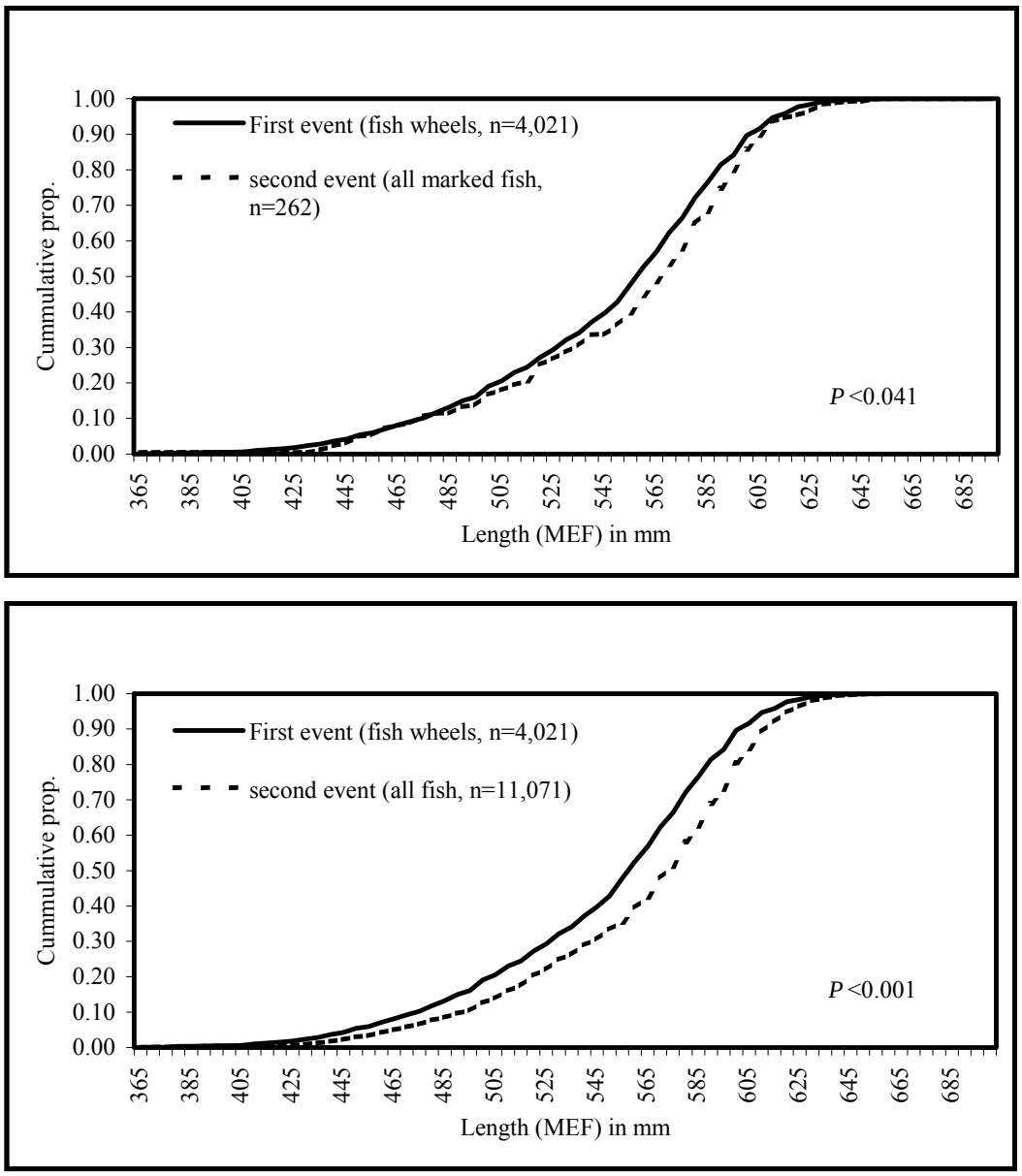



Figure 8.–Cumulative distribution function (CDF) of MEF lengths of sockeye salmon marked in the lower Chilkat River versus lengths of marked fish recaptured on spawning grounds (top) and versus lengths of fish examined for marks during recovery events (bottom), 2004.

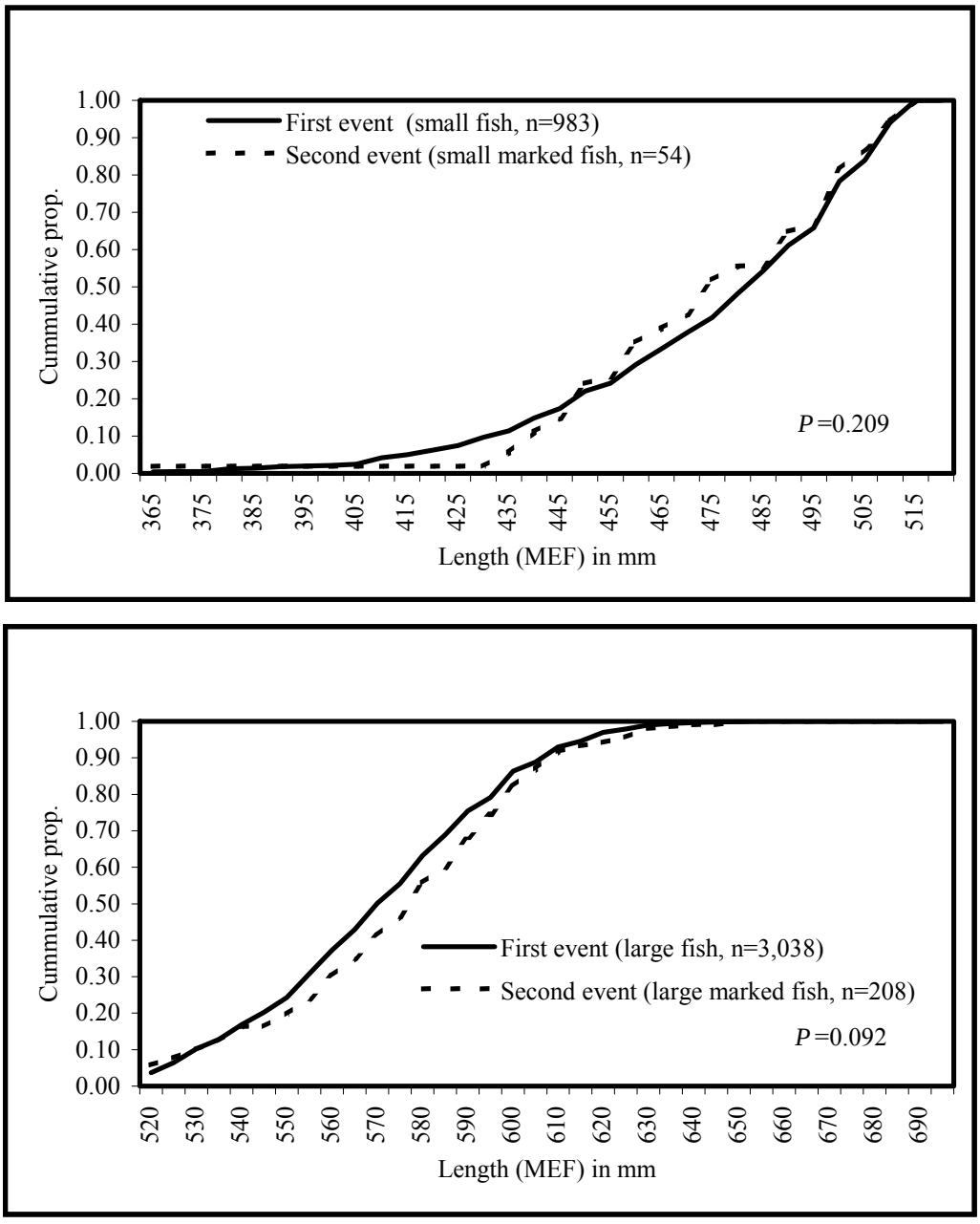
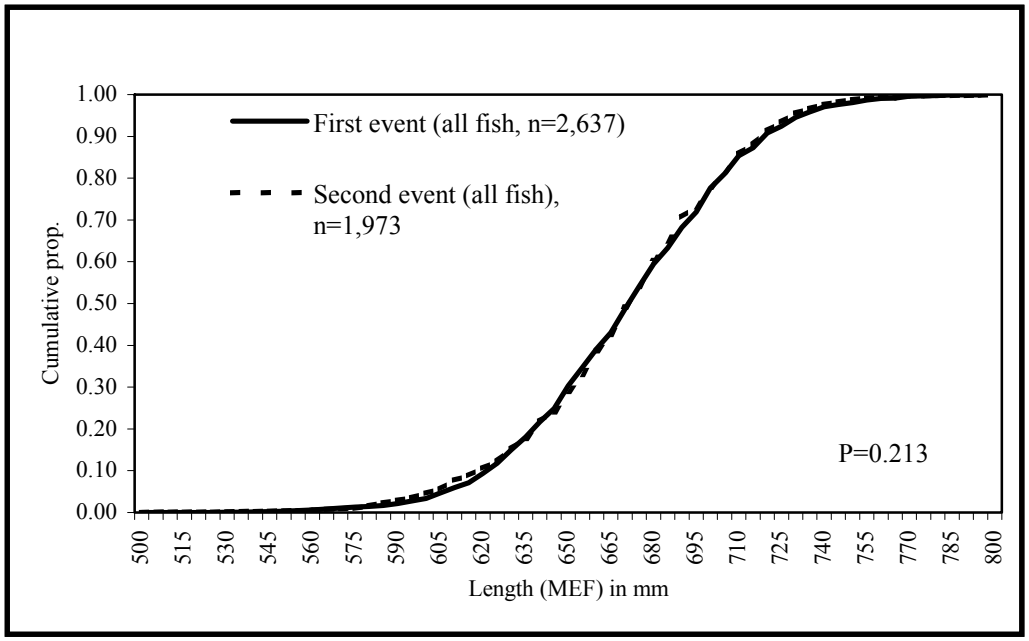



Figure 9.–Cumulative distribution function (CDF) of MEF lengths of small (top) and large (bottom) sockeye salmon marked in the lower Chilkat River versus lengths of marked fish recaptured on the spawning grounds, 2004.



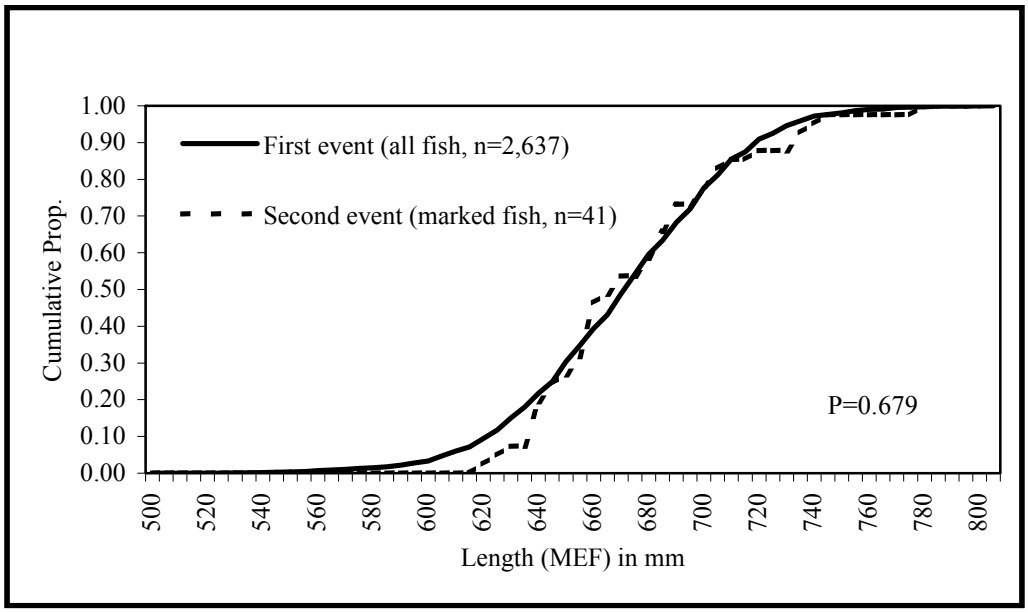




Figure 10.–Cumulative distribution function (CDF) of MEF lengths of chum salmon marked in the lower Chilkat River versus lengths of marked fish recaptured on the spawning grounds (top) and versus lengths of fish examined for marks on the spawning grounds (bottom), 2003.

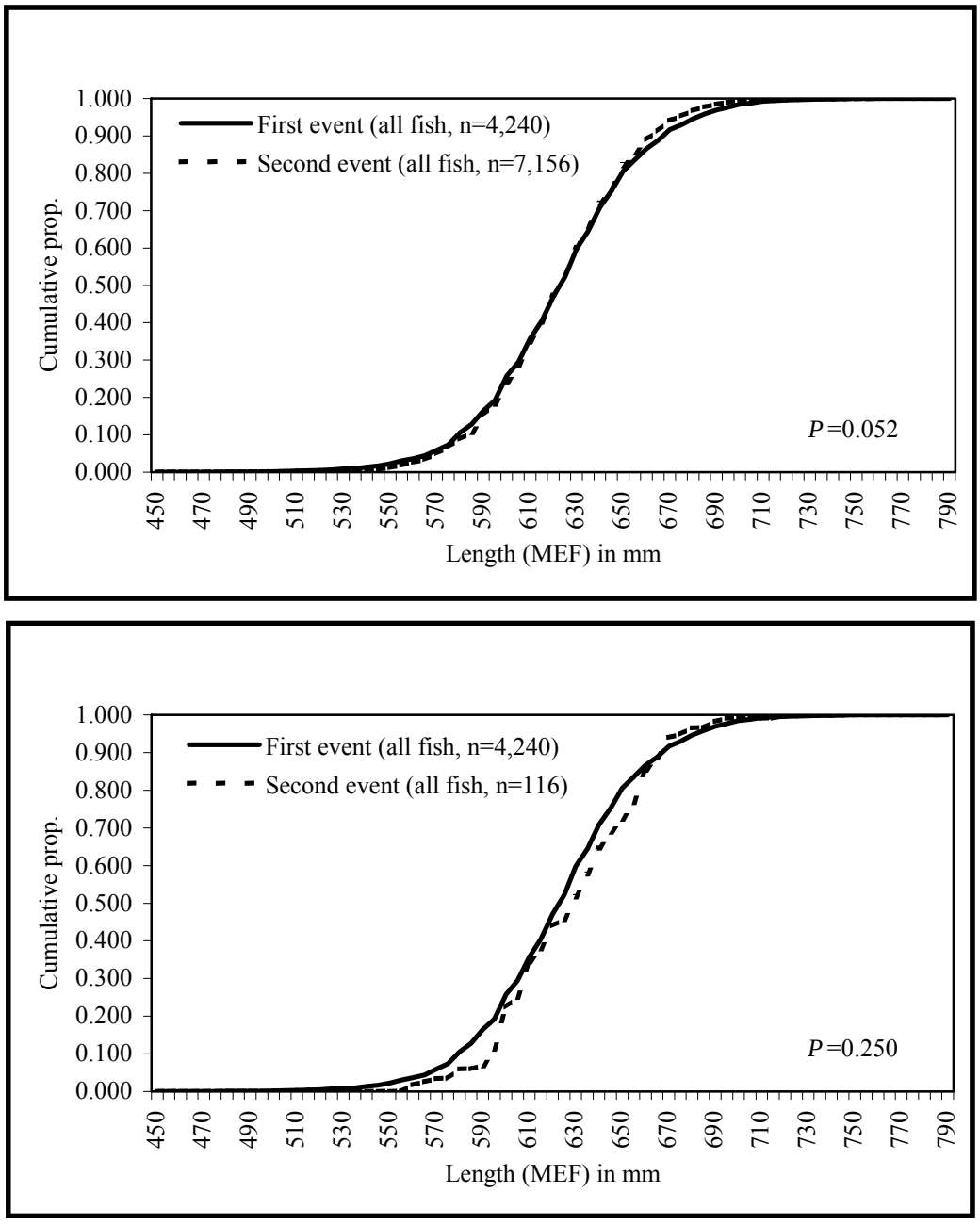



Figure 11.–Cumulative distribution function (CDF) of MEF lengths of chum salmon marked in the lower Chilkat River versus lengths of marked fish recaptured on the spawning grounds (top) and versus lengths of fish examined for marks on the spawning grounds (bottom), 2004.

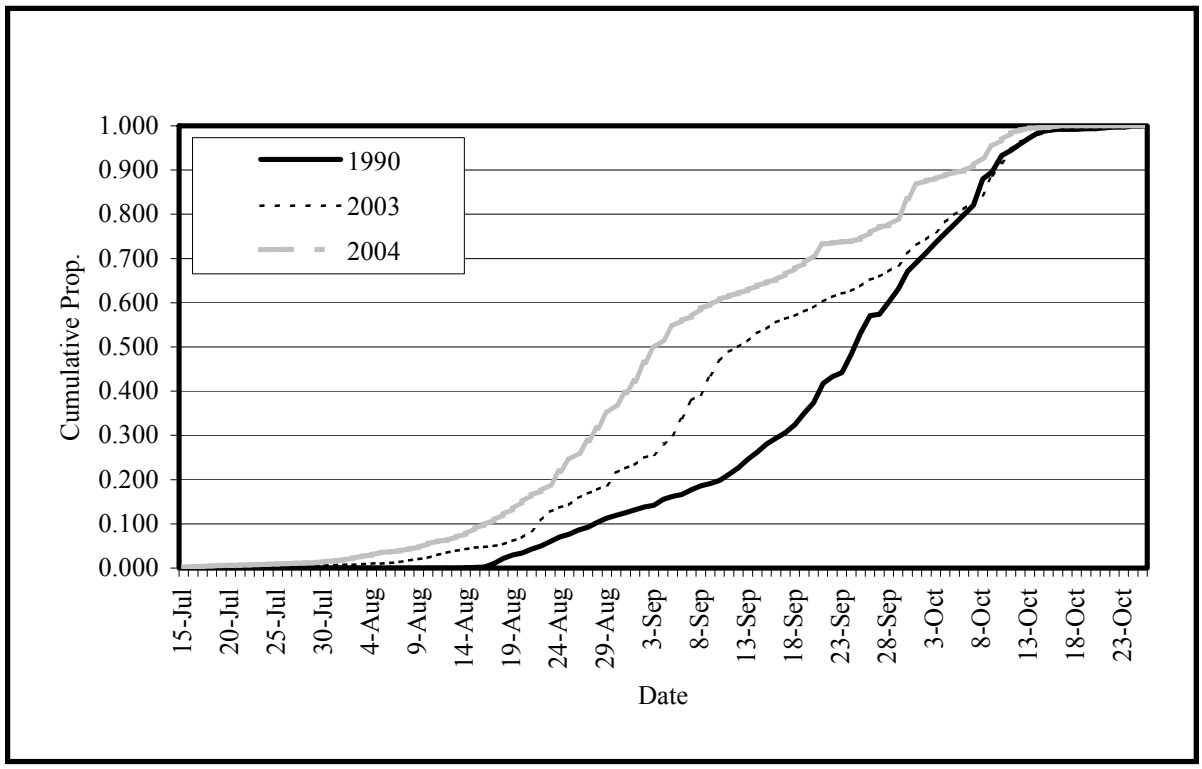



Figure 12.–Cumulative proportion of adult chum salmon captured in the Chilkat River fish wheels during 2003 and 2004, compared to the cumulative proportion of 1990.

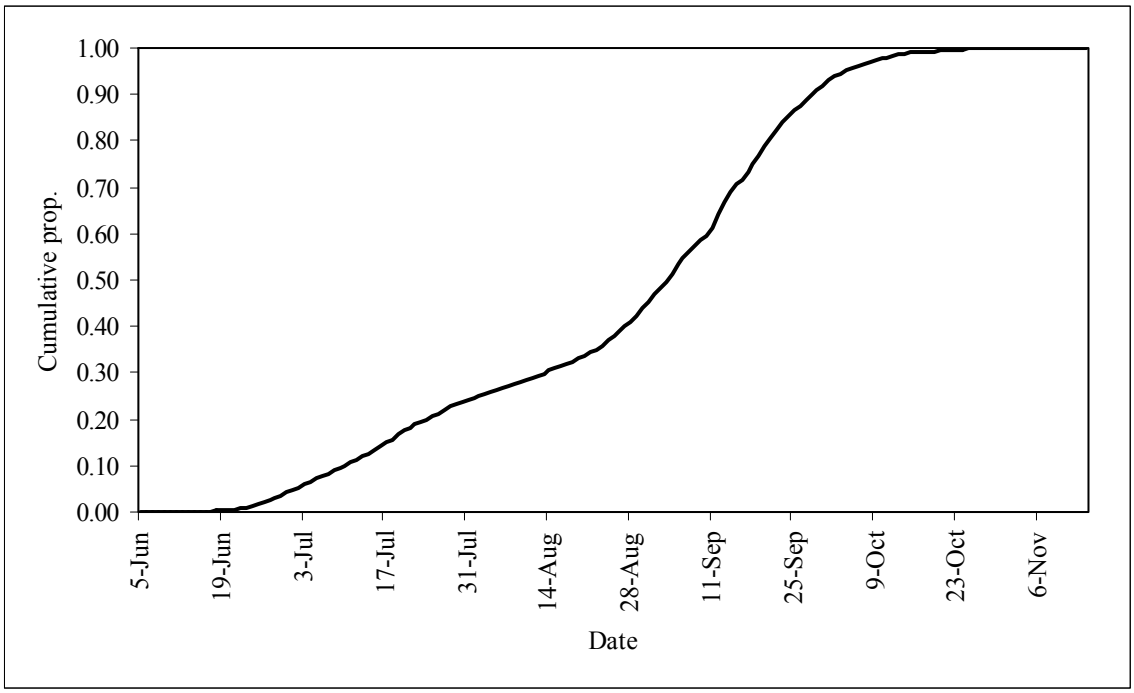



Figure 13.–Average cumulative proportions of Chilkat Lake sockeye salmon weir counts, 1970–1995 and 1999–2004.

# APPENDIX A

Appendix A1.–Calendar dates for statistical weeks in 2003.

| Statistical Week | From | Through | Statistical Week | From | Through |
|---|---|---|---|---|---|
| 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 A2.–Calendar dates for statistical weeks in 2004.

| Statistical Week | From | Through | Statistical Week | From | Through |
|---|---|---|---|---|---|
| 1 | 1-Jan | 3-Jan | 28 | 4-Jul | 10-Jul |
| 2 | 4-Jan | 10-Jan | 29 | 11-Jul | 17-Jul |
| 3 | 11-Jan | 17-Jan | 30 | 18-Jul | 24-Jul |
| 4 | 18-Jan | 24-Jan | 31 | 25-Jul | 31-Jul |
| 5 | 25-Jan | 31-Jan | 32 | 1-Aug | 7-Aug |
| 6 | 1-Feb | 7-Feb | 33 | 8-Aug | 14-Aug |
| 7 | 8-Feb | 14-Feb | 34 | 15-Aug | 21-Aug |
| 8 | 15-Feb | 21-Feb | 35 | 22-Aug | 28-Aug |
| 9 | 22-Feb | 28-Feb | 36 | 29-Aug | 4-Sep |
| 10 | 29-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 | | | |

# APPENDIX B

Appendix B1.–Chilkat River daily water level, temperature, fish wheel rpm, and fish wheel effort data, June 6 to July 31, 2003. Fish wheel I refers to the fish wheel located farthest upstream.

| Date | Statistical Week | Water Level | Water Temp.(C) | Fish Wheel I RPM | Fish Wheel II RPM | Fish Wheel I Effort | Fish Wheel II Effort |
|---|---|---|---|---|---|---|---|
| 6/6 | 23 | 120 | 8.1 | 3.0 | 0.0 | 13.50 | 0.00 |
| 6/7 | 23 | 142 | 8.0 | 3.5 | 2.5 | 23.50 | 13.25 |
| 6/8 | 24 | 139 | 8.1 | 3.5 | 2.2 | 24.00 | 24.00 |
| 6/9 | 24 | 138 | 8.5 | 3.5 | 2.3 | 24.00 | 24.00 |
| 6/10 | 24 | 142 | 8.8 | 3.6 | 2.3 | 24.00 | 24.00 |
| 6/11 | 24 | 149 | 9.0 | 3.9 | 2.5 | 23.70 | 23.80 |
| 6/12 | 24 | 152 | 9.3 | 3.8 | 2.1 | 24.00 | 24.00 |
| 6/13 | 24 | 156 | 9.2 | 3.8 | 2.1 | 24.00 | 24.00 |
| 6/14 | 24 | 152 | 7.1 | 3.7 | 2..1 | 24.00 | 24.00 |
| 6/15 | 25 | 142 | 8.4 | 3.3 | 2.2 | 24.00 | 24.00 |
| 6/16 | 25 | 138 | 8.3 | 3.0 | 2.2 | 24.00 | 24.00 |
| 6/17 | 25 | 136 | 8.3 | 3.1 | 2.1 | 24.00 | 24.00 |
| 6/18 | 25 | 146 | 8.0 | 3.6 | 2.6 | 24.00 | 24.00 |
| 6/19 | 25 | 150 | 7.5 | 3.7 | 2.3 | 24.00 | 24.00 |
| 6/20 | 25 | 135 | 7.0 | 3.4 | 2.1 | 23.75 | 23.50 |
| 6/21 | 25 | 130 | 8.1 | 3.3 | 2.1 | 24.00 | 24.00 |
| 6/22 | 26 | 135 | 8.5 | 3.1 | 2.1 | 24.00 | 24.00 |
| 6/23 | 26 | 133 | 8.6 | 2.7 | 2.0 | 24.00 | 24.00 |
| 6/24 | 26 | 133 | 8.0 | 2.5 | 1.8 | 24.00 | 24.00 |
| 6/25 | 26 | 133 | 7.8 | 3.1 | 2.1 | 24.00 | 24.00 |
| 6/26 | 26 | 137 | 7.6 | 2.8 | 2.0 | 24.00 | 24.00 |
| 6/27 | 26 | 140 | 7.1 | 2.9 | 2.5 | 24.00 | 23.75 |
| 6/28 | 26 | 130 | 8.1 | 2.7 | 2.1 | 24.00 | 24.00 |
| 6/29 | 27 | 128 | 8.0 | 2.1 | 1.3 | 24.00 | 24.00 |
| 6/30 | 27 | 128 | 8.1 | 2.1 | 1.5 | 24.00 | 24.00 |
| 7/1 | 27 | 141 | 8.0 | 2.3 | 2.2 | 24.00 | 24.00 |
| 7/2 | 27 | 148 | 10.1 | 3.2 | 2.3 | 24.00 | 24.00 |
| 7/3 | 27 | 154 | 7.9 | 3.2 | 2.2 | 24.00 | 24.00 |
| 7/4 | 27 | 153 | 7.3 | 3.0 | 2.0 | 24.00 | 24.00 |
| 7/5 | 27 | 149 | 8.0 | 2.9 | 2.1 | 24.00 | 24.00 |
| 7/6 | 28 | 146 | 7.5 | 2.8 | 2.0 | 24.00 | 24.00 |
| 7/7 | 28 | 144 | 8.6 | 3.5 | 2.2 | 16.80 | 24.00 |
| 7/8 | 28 | 155 | 9.0 | 3.0 | 2.3 | 22.50 | 12.00 |
| 7/9 | 28 | 161 | 8.7 | 3.7 | 2.5 | 24.00 | 24.00 |
| 7/10 | 28 | 164 | 9.5 | 3.3 | 2.3 | 24.00 | 24.00 |
| 7/11 | 28 | 166 | 9.9 | 3.7 | 2.6 | 24.00 | 24.00 |
| 7/12 | 28 | 171 | 9.2 | 3.6 | 2.7 | 24.00 | 24.00 |
| 7/13 | 29 | 172 | 9.3 | 3.8 | 2.6 | 24.00 | 24.00 |
| 7/14 | 29 | 179 | 9.5 | 4.1 | 2.5 | 24.00 | 24.00 |
| 7/15 | 29 | 173 | 8.8 | 4.0 | 2.7 | 24.00 | 24.00 |
| 7/16 | 29 | 163 | 7.5 | 3.9 | 2.6 | 24.00 | 24.00 |
| 7/17 | 29 | 156 | 8.0 | 3.8 | 2.6 | 24.00 | 24.00 |
| 7/18 | 29 | 152 | 7.5 | 3.6 | 2.5 | 24.00 | 24.00 |
| 7/19 | 29 | 153 | 8.6 | 3.1 | 2.4 | 24.00 | 24.00 |
| 7/20 | 30 | 160 | 8.7 | 3.6 | 2.8 | 24.00 | 24.00 |
| 7/21 | 30 | 168 | 8.5 | 3.7 | 2.9 | 24.00 | 24.00 |
| 7/22 | 30 | 162 | 7.8 | 3.6 | 3.0 | 24.00 | 24.00 |
| 7/23 | 30 | 151 | 7.1 | 3.4 | 2.9 | 24.00 | 24.00 |
| 7/24 | 30 | 146 | 8.2 | 3.6 | 2.4 | 24.00 | 24.00 |
| 7/25 | 30 | 143 | 7.5 | 3.5 | 2.3 | 12.00 | 24.00 |
| 7/26 | 30 | 138 | 7.1 | – | 2.1 | – | 24.00 |
| 7/27 | 31 | 132 | 7.4 | – | 2.0 | – | 24.00 |
| 7/28 | 31 | 133 | 7.5 | – | 2.1 | – | 24.00 |
| 7/29 | 31 | 133 | 7.5 | – | 2.4 | – | 24.00 |
| 7/30 | 31 | 138 | 7.5 | 2.3 | 2.5 | 12.00 | 24.00 |
| 7/31 | 31 | 137 | 7.5 | 2.2 | 2.2 | 18.00 | 24.00 |

Appendix B2.–Chilkat River daily water level, temperature, fish wheel rpm, and fish wheel effort data, August 1 to September 30, 2003. Fish wheel I refers to the fish wheel located farthest upstream.

| Date | Statistical Week | Water Level | Water Temp.(C) | Fish Wheel I RPM | Fish Wheel II RPM | Fish Wheel I Effort | Fish Wheel II Effort |
|---|---|---|---|---|---|---|---|
| 8/1 | 31 | 134 | 7.1 | 2.3 | 2.4 | 24.00 | 24.00 |
| 8/2 | 31 | 138 | 8.1 | 2.4 | 2.3 | 24.00 | 24.00 |
| 8/3 | 32 | 138 | 7.6 | 2.4 | 2.3 | 24.00 | 24.00 |
| 8/4 | 32 | 138 | 7.5 | 2.3 | 2.4 | 24.00 | 24.00 |
| 8/5 | 32 | 136 | 7.0 | 2.4 | 2.5 | 24.00 | 24.00 |
| 8/6 | 32 | 132 | 8.0 | 2.3 | 2.4 | 24.00 | 24.00 |
| 8/7 | 32 | 136 | 8.0 | 2.4 | 2.6 | 24.00 | 24.00 |
| 8/8 | 32 | 143 | 8.6 | 2.6 | 2.7 | 24.00 | 24.00 |
| 8/9 | 32 | 144 | 7.6 | 2.5 | 2.6 | 24.00 | 24.00 |
| 8/10 | 33 | 135 | 7.4 | 2.6 | 2.6 | 24.00 | 24.00 |
| 8/11 | 33 | 134 | 7.5 | 2.6 | 2.6 | 24.00 | 24.00 |
| 8/12 | 33 | 134 | 7.8 | 2.4 | 2.6 | 24.00 | 24.00 |
| 8/13 | 33 | 134 | 7.0 | 2.0 | 2.5 | 24.00 | 24.00 |
| 8/14 | 33 | 137 | 8.0 | 2.1 | 2.6 | 24.00 | 24.00 |
| 8/15 | 33 | 165 | 8.5 | 3.1 | 3.4 | 24.00 | 24.00 |
| 8/16 | 33 | 202 | 7.8 | 3.1 | 3.5 | 24.00 | 21.50 |
| 8/17 | 34 | 198 | 6.9 | 3.0 | 3.4 | 24.00 | 24.00 |
| 8/18 | 34 | 173 | 6.5 | 2.4 | 3.0 | 24.00 | 24.00 |
| 8/19 | 34 | 141 | 7.5 | 2.1 | 2.3 | 24.00 | 24.00 |
| 8/20 | 34 | 138 | 7.6 | 2.1 | 2.3 | 24.00 | 24.00 |
| 8/21 | 34 | 119 | 6.8 | 2.0 | 1.8 | 24.00 | 24.00 |
| 8/22 | 34 | 114 | 6.5 | 2.2 | 1.9 | 24.00 | 24.00 |
| 8/23 | 34 | 106 | 7.5 | 2.0 | 1.8 | 24.00 | 18.00 |
| 8/24 | 35 | 105 | 7.6 | 2.0 | 1.8 | 24.00 | 24.00 |
| 8/25 | 35 | 103 | 7.5 | 1.9 | 1.9 | 24.00 | 24.00 |
| 8/26 | 35 | 100 | 7.0 | 1.7 | 1.7 | 24.00 | 24.00 |
| 8/27 | 35 | 103 | 7.8 | 1.7 | 2.1 | 24.00 | 24.00 |
| 8/28 | 35 | 106 | 7.6 | 2.0 | 2.0 | 24.00 | 16.00 |
| 8/29 | 35 | 110 | 7.3 | 2.6 | 2.1 | 24.00 | 7.75 |
| 8/30 | 35 | 118 | 7.6 | 2.8 | 2.3 | 24.00 | 24.00 |
| 8/31 | 36 | 139 | 6.8 | 2.8 | 2.4 | 24.00 | 24.00 |
| 9/1 | 36 | 126 | 6.5 | 2.9 | 2.5 | 24.00 | 24.00 |
| 9/2 | 36 | 134 | 6.8 | 3.5 | 2.1 | 24.00 | 24.00 |
| 9/3 | 36 | 160 | 6.4 | 3.2 | 2.9 | 24.00 | 24.00 |
| 9/4 | 36 | 132 | 6.5 | 3.1 | 2.7 | 24.00 | 24.00 |
| 9/5 | 36 | 120 | 5.8 | 1.8 | 1.7 | 24.00 | 9.00 |
| 9/6 | 36 | 113 | 7.0 | 1.9 | 1.9 | 24.00 | 24.00 |
| 9/7 | 37 | 121 | 6.8 | 2.0 | 2.3 | 24.00 | 24.00 |
| 9/8 | 37 | 126 | 6.9 | 2.0 | 2.2 | 24.00 | 24.00 |
| 9/9 | 37 | 119 | 7.1 | 1.9 | 2.1 | 24.00 | 24.00 |
| 9/10 | 37 | 113 | 6.6 | 1.6 | 0.3 | 24.00 | 17.50 |
| 9/11 | 37 | 106 | 6.8 | 1.5 | 1.3 | 24.00 | 24.00 |
| 9/12 | 37 | 107 | 7.3 | 1.6 | 1.2 | 24.00 | 24.00 |
| 9/13 | 37 | 108 | 7.4 | 1.6 | 1.4 | 24.00 | 24.00 |
| 9/14 | 38 | 104 | 7.2 | 1.8 | 0.5 | 24.00 | 15.00 |
| 9/15 | 38 | 87 | 5.1 | 2.8 | 0.0 | 15.00 | 0.00 |
| 9/16 | 38 | 64 | 5.5 | 1.3 | 2.3 | 24.00 | 22.00 |
| 9/17 | 38 | 58 | 4.8 | 1.1 | 2.1 | 24.00 | 24.00 |
| 9/18 | 38 | 55 | 4.8 | 1.5 | 1.7 | 24.00 | 24.00 |
| 9/19 | 38 | 53 | 4.5 | 1.2 | 1.7 | 24.00 | 24.00 |
| 9/20 | 38 | 52 | 5.3 | 1.4 | 1.5 | 24.00 | 24.00 |
| 9/21 | 39 | 60 | 6.3 | 1.5 | 2.2 | 24.00 | 24.00 |
| 9/22 | 39 | 55 | 6.5 | 2.2 | 2.1 | 24.00 | 24.00 |
| 9/23 | 39 | 52 | 5.4 | 1.5 | 2.2 | 24.00 | 24.00 |
| 9/24 | 39 | 55 | 4.9 | 2.2 | 2.4 | 24.00 | 24.00 |
| 9/25 | 39 | 58 | 5.3 | 2.0 | 2.3 | 24.00 | 24.00 |
| 9/26 | 39 | 66 | 6.1 | 2.7 | 3.0 | 24.00 | 24.00 |
| 9/27 | 39 | 66 | 6.3 | 2.7 | 3.7 | 24.00 | 24.00 |
| 9/28 | 40 | 67 | 6.6 | 2.6 | 3.5 | 24.00 | 24.00 |
| 9/29 | 40 | 70 | 6.9 | 3.2 | 3.3 | 24.00 | 24.00 |
| 9/30 | 40 | 80 | 6.9 | 3.6 | 3.8 | 24.00 | 24.00 |

Appendix B3.–Chilkat River daily water level, temperature, fish wheel rpm, and fish wheel effort data, October 1 to October 21 (end of season), 2003. Fish wheel I refers to the fish wheel located farthest upstream.

| Date | Statistical Week | Water Level | Water Temp.(C) | Fish Wheel I RPM | Fish Wheel II RPM | Fish Wheel I Effort | Fish Wheel II Effort |
|---|---|---|---|---|---|---|---|
| 10/1 | 40 | 91 | 6.8 | 3.7 | 3.8 | 21.00 | 24.00 |
| 10/2 | 40 | 90 | 6.0 | 3.6 | 3.7 | 24.00 | 24.00 |
| 10/3 | 40 | 90 | 5.4 | 3.5 | 3.6 | 24.00 | 24.00 |
| 10/4 | 40 | 116 | 6.1 | 3.7 | 3.7 | 24.00 | 24.00 |
| 10/5 | 41 | 133 | 6.3 | 3.0 | 3.6 | 20.00 | 24.00 |
| 10/6 | 41 | 125 | 5.8 | 2.2 | 3.5 | 24.00 | 24.00 |
| 10/7 | 41 | 121 | 5.9 | 1.7 | 3.8 | 24.00 | 24.00 |
| 10/8 | 41 | 144 | 6.1 | 1.5 | 3.7 | 24.00 | 24.00 |
| 10/9 | 41 | 99 | 5.3 | 1.8 | 2.1 | 20.00 | 24.00 |
| 10/10 | 41 | 80 | 5.3 | 1.8 | 1.8 | 22.00 | 24.00 |
| 10/11 | 41 | 71 | 4.9 | 1.2 | 1.2 | 24.00 | 24.00 |
| 10/12 | 41 | 63 | 4.1 | 2.0 | 1.6 | 24.00 | 24.00 |
| 10/13 | 42 | 57 | 3.7 | 1.5 | 1.8 | 24.00 | 24.00 |
| 10/14 | 42 | 54 | 4.0 | 1.0 | 1.5 | 24.00 | 24.00 |
| 10/15 | 42 | 51 | 4.0 | 1.2 | 1.5 | 24.00 | 24.00 |
| 10/16 | 42 | 47 | 1.6 | 1.0 | 1.2 | 24.00 | 24.00 |
| 10/17 | 42 | 44 | 1.9 | 0.5 | 1.5 | 24.00 | 24.00 |
| 10/18 | 42 | 44 | 3.4 | 0.3 | 1.2 | 24.00 | 9.25 |
| 10/19 | 42 | 50 | 5.3 | 0.3 | N/A | 24.00 | N/A |
| 10/20 | 43 | 51 | 5.9 | 0.5 | N/A | 15.00 | N/A |
| 10/21 | 43 | 45 | 3.4 | 1.8 | N/A | 24.00 | N/A |

Appendix B4.–Chilkat River daily water level, temperature, fish wheel rpm, and fish wheel effort data, June 7 to July 31, 2004. Fish wheel I refers to the fish wheel located farthest upstream.

| Date | Statistical Week | Water Level | Water Temp.(C) | Fish Wheel I RPM | Fish Wheel II RPM | Fish Wheel I Effort | Fish Wheel II Effort |
|---|---|---|---|---|---|---|---|
| 6/7 | 24 | 163 | 8.5 | 2.9 | 2.6 | 14.00 | 12.50 |
| 6/8 | 24 | 180 | 8.4 | 3.3 | 2.2 | 24.00 | 24.00 |
| 6/9 | 24 | 187 | 8.5 | 2.7 | 2.1 | 24.00 | 15.50 |
| 6/10 | 24 | 163 | 7.5 | 3.0 | 1.7 | 24.00 | 24.00 |
| 6/11 | 24 | 148 | 7.4 | 3.2 | 2.3 | 15.00 | 24.00 |
| 6/12 | 24 | 138 | 7.8 | 2.8 | 2.0 | 24.00 | 24.00 |
| 6/13 | 25 | 136 | 8.4 | 1.5 | 2.1 | 24.00 | 24.00 |
| 6/14 | 25 | 145 | 8.8 | 2.6 | 2.7 | 24.00 | 24.00 |
| 6/15 | 25 | 143 | 8.0 | 2.1 | 2.6 | 24.00 | 24.00 |
| 6/16 | 25 | 141 | 7.5 | 1.7 | 2.2 | 24.00 | 24.00 |
| 6/17 | 25 | 145 | 8.7 | 1.8 | 2.5 | 24.00 | 24.00 |
| 6/18 | 25 | 156 | 9.2 | 1.7 | 2.7 | 24.00 | 24.00 |
| 6/19 | 25 | 170 | 9.3 | 2.4 | 2.6 | 24.00 | 24.00 |
| 6/20 | 26 | 183 | 9.5 | 2.6 | 2.3 | 24.00 | 24.00 |
| 6/21 | 26 | 187 | 9.7 | 2.1 | 2.5 | 24.00 | 24.00 |
| 6/22 | 26 | 186 | 9.7 | 2.3 | 2.6 | 24.00 | 24.00 |
| 6/23 | 26 | 186 | 9.6 | 2.7 | 2.6 | 24.00 | 24.00 |
| 6/24 | 26 | 187 | 9.9 | 2.4 | 2.5 | 24.00 | 24.00 |
| 6/25 | 26 | 185 | 10.1 | 2.3 | 2.6 | 24.00 | 24.00 |
| 6/26 | 26 | 186 | 10.0 | 3.0 | 2.9 | 24.00 | 24.00 |
| 6/27 | 27 | 184 | 9.7 | 2.3 | 2.7 | 24.00 | 24.00 |
| 6/28 | 27 | 187 | 9.7 | 2.8 | 2.5 | 23.50 | 15.00 |
| 6/29 | 27 | 187 | 8.8 | 2.8 | 2.6 | 24.00 | 24.00 |
| 6/30 | 27 | 187 | 9.4 | 3.0 | 2.9 | 24.00 | 24.00 |
| 7/1 | 27 | 180 | 8.3 | 2.9 | 2.9 | 22.50 | 24.00 |
| 7/2 | 27 | 176 | 8.2 | 1.8 | 2.6 | 24.00 | 24.00 |
| 7/3 | 27 | 176 | 9.3 | 2.7 | 2.9 | 24.00 | 24.00 |
| 7/4 | 28 | 167 | 8.7 | 2.9 | 2.8 | 24.00 | 24.00 |
| 7/5 | 28 | 160 | 8.9 | 2.6 | 2.7 | 24.00 | 24.00 |
| 7/6 | 28 | 154 | 8.8 | 2.4 | 2.7 | 24.00 | 24.00 |
| 7/7 | 28 | 157 | 9.1 | 2.2 | 2.5 | 24.00 | 24.00 |
| 7/8 | 28 | 159 | 9.2 | 2.3 | 2.3 | 24.00 | 24.00 |
| 7/9 | 28 | 164 | 9.2 | 2.5 | 2.5 | 24.00 | 24.00 |
| 7/10 | 28 | 162 | 9.2 | 1.9 | 2.6 | 24.00 | 24.00 |
| 7/11 | 29 | 150 | 8.2 | 1.7 | 2.1 | 24.00 | 24.00 |
| 7/12 | 29 | 150 | 9.2 | 2.0 | 2.2 | 24.00 | 24.00 |
| 7/13 | 29 | 155 | 9.2 | 2.2 | 2.3 | 24.00 | 24.00 |
| 7/14 | 29 | 155 | 9.4 | 2.2 | 2.4 | 24.00 | 24.00 |
| 7/15 | 29 | 157 | 9.3 | 2.2 | 2.2 | 24.00 | 24.00 |
| 7/16 | 29 | 164 | 9.9 | 2.5 | 2.2 | 24.00 | 24.00 |
| 7/17 | 29 | 165 | 10.3 | 2.5 | 2.3 | 24.00 | 24.00 |
| 7/18 | 30 | 156 | 10.2 | 2.5 | 2.1 | 24.00 | 24.00 |
| 7/19 | 30 | 152 | 10.2 | 2.0 | 2.1 | 24.00 | 24.00 |
| 7/20 | 30 | 151 | 10.3 | 2.0 | 2.3 | 24.00 | 24.00 |
| 7/21 | 30 | 155 | 10.5 | 2.1 | 2.4 | 24.00 | 24.00 |
| 7/22 | 30 | 152 | 10.0 | 2.3 | 2.4 | 24.00 | 24.00 |
| 7/23 | 30 | 146 | 9.5 | 1.9 | 2.1 | 24.00 | 24.00 |
| 7/24 | 30 | 150 | 8.8 | 2.7 | 2.1 | 24.00 | 24.00 |
| 7/25 | 31 | 150 | 9.1 | 2.8 | 2.1 | 24.00 | 24.00 |
| 7/26 | 31 | 145 | 9.5 | 2.4 | 2.0 | 24.00 | 24.00 |
| 7/27 | 31 | 135 | 9.1 | 2.1 | 1.9 | 24.00 | 24.00 |
| 7/28 | 31 | 149 | 9.2 | 2.3 | 2.1 | 24.00 | 24.00 |
| 7/29 | 31 | 166 | 8.3 | 2.8 | 2.6 | 24.00 | 22.00 |
| 7/30 | 31 | 159 | 8.1 | 2.5 | 2.2 | 24.00 | 24.00 |
| 7/31 | 31 | 145 | 8.3 | 2.7 | 2.4 | 24.00 | 24.00 |

Appendix B5.–Chilkat River daily water level, temperature, fish wheel rpm, and fish wheel effort data, June 7 to July 31, 2004. Fish wheel I refers to the fish wheel located farthest upstream.

| Date | Statistical Week | Water Level | Water Temp.(C) | Fish Wheel I RPM | Fish Wheel II RPM | Fish Wheel I Effort | Fish Wheel II Effort |
|---|---|---|---|---|---|---|---|
| 8/1 | 32 | 138 | 8.1 | 1.7 | 2.5 | 24.00 | 24.00 |
| 8/2 | 32 | 126 | 8.3 | 1.4 | 2.3 | 24.00 | 24.00 |
| 8/3 | 32 | 144 | 7.9 | 2.1 | 2.6 | 24.00 | 24.00 |
| 8/4 | 32 | 136 | 7.6 | 1.8 | 2.0 | 24.00 | 24.00 |
| 8/5 | 32 | 137 | 8.3 | 1.2 | 1.7 | 24.00 | 24.00 |
| 8/6 | 32 | 146 | 9.5 | 2.1 | 1.5 | 24.00 | 13.50 |
| 8/7 | 32 | 151 | 9.6 | 2.4 | 1.3 | 24.00 | 24.00 |
| 8/8 | 33 | 150 | 9.7 | 1.8 | 0.0 | 24.00 | 0.00 |
| 8/9 | 33 | 150 | 9.6 | 2.0 | 0.0 | 24.00 | 0.00 |
| 8/10 | 33 | 146 | 9.7 | 2.1 | 0.0 | 24.00 | 0.00 |
| 8/11 | 33 | 167 | 9.0 | 2.3 | 0.0 | 24.00 | 8.50 |
| 8/12 | 33 | 154 | 9.5 | 1.9 | 3.3 | 24.00 | 24.00 |
| 8/13 | 33 | 134 | 9.2 | 3.4 | 1.6 | 24.00 | 24.00 |
| 8/14 | 33 | 126 | 9.3 | 3.4 | 1.6 | 24.00 | 24.00 |
| 8/15 | 34 | 152 | 9.2 | 3.3 | 1.6 | 24.00 | 24.00 |
| 8/16 | 34 | 158 | 8.6 | 3.2 | 1.5 | 24.00 | 24.00 |
| 8/17 | 34 | 164 | 8.6 | 3.1 | 1.7 | 24.00 | 24.00 |
| 8/18 | 34 | 165 | 8.3 | 3.4 | 1.8 | 24.00 | 24.00 |
| 8/19 | 34 | 154 | 8.4 | 3.3 | 1.9 | 24.00 | 25.00 |
| 8/20 | 34 | 152 | 8.3 | 3.1 | 1.9 | 25.00 | 24.00 |
| 8/21 | 34 | 146 | 8.6 | 3.3 | 1.8 | 24.00 | 24.00 |
| 8/22 | 35 | 146 | 8.7 | 3.2 | 1.4 | 24.00 | 24.00 |
| 8/23 | 35 | 138 | 8.2 | 2.8 | 1.5 | 24.00 | 17.50 |
| 8/24 | 35 | 128 | 7.8 | 3.0 | 3.2 | 24.00 | 24.00 |
| 8/25 | 35 | 117 | 7.3 | 3.0 | 3.4 | 21.00 | 24.00 |
| 8/26 | 35 | 116 | 6.9 | 2.7 | 3.4 | 15.00 | 24.00 |
| 8/27 | 35 | 124 | 7.1 | 2.9 | 3.7 | 24.00 | 24.00 |
| 8/28 | 35 | 135 | 8.6 | 3.0 | 3.9 | 24.00 | 24.00 |
| 8/29 | 36 | 130 | 8.9 | 2.8 | 3.7 | 24.00 | 24.00 |
| 8/30 | 36 | 122 | 7.6 | 2.9 | 3.6 | 24.00 | 24.00 |
| 8/31 | 36 | 118 | 7.0 | 2.4 | 2.8 | 24.00 | 24.00 |
| 9/1 | 36 | 116 | 6.4 | 2.9 | 3.1 | 24.00 | 24.00 |
| 9/2 | 36 | 112 | 7.5 | 2.9 | 3.1 | 24.00 | 24.00 |
| 9/3 | 36 | 137 | 7.5 | 3.2 | 3.1 | 24.00 | 24.00 |
| 9/4 | 36 | 122 | 7.4 | 3.3 | 3.6 | 24.00 | 24.00 |
| 9/5 | 37 | 118 | 6.4 | 3.2 | 3.6 | 24.00 | 24.00 |
| 9/6 | 37 | 108 | 5.6 | 3.3 | 3.6 | 24.00 | 24.00 |
| 9/7 | 37 | 82 | 5.6 | 3.0 | 3.0 | 24.00 | 24.00 |
| 9/8 | 37 | 72 | 5.5 | 3.0 | 3.0 | 24.00 | 24.00 |
| 9/9 | 37 | 67 | 5.5 | 3.0 | 3.0 | 24.00 | 24.00 |
| 9/10 | 37 | 62 | 5.6 | 2.9 | 3.0 | 24.00 | 24.00 |
| 9/11 | 37 | 58 | 6.5 | 2.9 | 2.9 | 24.00 | 24.00 |
| 9/12 | 38 | 58 | 6.6 | 2.7 | 2.4 | 24.00 | 24.00 |
| 9/13 | 38 | 62 | 6.8 | 2.7 | 2.5 | 24.00 | 24.00 |
| 9/14 | 38 | 61 | 6.6 | 2.6 | 2.5 | 24.00 | 24.00 |
| 9/15 | 38 | 62 | 7.4 | 2.7 | 2.7 | 24.00 | 24.00 |
| 9/16 | 38 | 58 | 7.4 | 2.7 | 2.8 | 24.00 | 24.00 |
| 9/17 | 38 | 50 | 7.3 | 2.7 | 2.8 | 24.00 | 24.00 |
| 9/18 | 38 | 46 | 7.4 | 2.5 | 2.7 | 24.00 | 24.00 |
| 9/19 | 39 | 42 | 7.2 | 2.6 | 2.7 | 24.00 | 24.00 |
| 9/20 | 39 | 44 | 6.9 | 2.8 | 2.6 | 24.00 | 24.00 |
| 9/21 | 39 | 58 | 7.4 | 2.9 | 2.8 | 20.00 | 24.00 |
| 9/22 | 39 | 83 | 7.4 | 2.8 | 3.1 | 11.00 | 24.00 |
| 9/23 | 39 | 79 | 7.0 | 3.1 | 3.3 | 24.00 | 24.00 |
| 9/24 | 39 | 97 | 7.0 | 3.0 | 3.2 | 24.00 | 24.00 |
| 9/25 | 39 | 80 | 6.0 | 2.6 | 3.0 | 12.00 | 24.00 |
| 9/26 | 40 | 78 | 6.0 | 2.6 | 2.8 | 24.00 | 24.00 |
| 9/27 | 40 | 110 | 6.4 | 2.3 | 2.1 | 24.00 | 24.00 |
| 9/28 | 40 | 92 | 6.4 | 2.3 | 2.3 | 24.00 | 24.00 |
| 9/29 | 40 | 80 | 6.4 | 2.6 | 3.0 | 24.00 | 24.00 |
| 9/30 | 40 | 70 | 7.1 | 2.6 | 3.0 | 24.00 | 24.00 |

Appendix B6.–Chilkat River daily water level, temperature, fish wheel rpm, and fish wheel effort data, October 1 to October 19 (end of season), 2004. Fish wheel I refers to the fish wheel located farthest upstream.

| Date | Statistical Week | Water Level | Water Temp.(C) | Fish Wheel I RPM | Fish Wheel II RPM | Fish wheel I Effort | Fish Wheel II Effort |
|---|---|---|---|---|---|---|---|
| 10/1 | 40 | 73 | 8.0 | 2.0 | 2.3 | 24.00 | 24.00 |
| 10/2 | 40 | 88 | 8.0 | 2.4 | 3.6 | 24.00 | 24.00 |
| 10/3 | 41 | 93 | 7.1 | 2.5 | 3.5 | 24.00 | 24.00 |
| 10/4 | 41 | 87 | 7.5 | 2.7 | 3.2 | 24.00 | 24.00 |
| 10/5 | 41 | 112 | 8.1 | 2.6 | 3.6 | 24.00 | 24.00 |
| 10/6 | 41 | 117 | 6.3 | 2.6 | 4.1 | 19.00 | 24.00 |
| 10/7 | 41 | 94 | 6.3 | 2.2 | 3.8 | 24.00 | 24.00 |
| 10/8 | 41 | 85 | 6.0 | 2.7 | 3.7 | 24.00 | 24.00 |
| 10/9 | 41 | 79 | 6.4 | 2.6 | 3.8 | 24.00 | 24.00 |
| 10/10 | 42 | 72 | 6.4 | 2.7 | 4.0 | 24.00 | 24.00 |
| 10/11 | 42 | 71 | 6.4 | 2.6 | 3.9 | 24.00 | 24.00 |
| 10/12 | 42 | 45 | 3.7 | 2.6 | 3.9 | 24.00 | 24.00 |
| 10/13 | 42 | 52 | 3.9 | 2.5 | 3.5 | 24.00 | 24.00 |
| 10/14 | 42 | 76 | 4.4 | 2.5 | 3.4 | 24.00 | 24.00 |
| 10/15 | 42 | 79 | 4.6 | 2.4 | 3.3 | 24.00 | 24.00 |
| 10/16 | 42 | 64 | 3.1 | 2.7 | 3.2 | 24.00 | 24.00 |
| 10/17 | 43 | 58 | 1.9 | 2.5 | 2.7 | 24.00 | 24.00 |
| 10/18 | 43 | 58 | 1.3 | 1.8 | 2.5 | 24.00 | 24.00 |
| 10/19 | 43 | 44 | -0.1 | 1.5 | 2.1 | 12.00 | 12.00 |

Appendix B7.–Daily catch, daily marked, and catch-per-unit-of-effort (CPUE) of sockeye salmon captured in the Chilkat River fish wheels, from June 9 to July 31, 2003.

| Date | Daily Sockeye Catch | Cumulative Sockeye Catch | Daily Sockeye Marked | Cumulative Sockeye Marked | Daily CPUE | Cumulative Prop. CPUE |
|---|---|---|---|---|---|---|
| 6/9 | 1 | 1 | 1 | 1 | 0.0 6 | 0.00 |
| 6/10 | 0 | 1 | 0 | 1 | 0.00 | 0.00 |
| 6/11 | 1 | 2 | 0 | 1 | 0.06 | 0.06 |
| 6/12 | 1 | 3 | 1 | 2 | 0.06 | 0.13 |
| 6/13 | 2 | 5 | 2 | 4 | 0.13 | 0.25 |
| 6/14 | 1 | 6 | 1 | 5 | 0.06 | 0.31 |
| 6/15 | 10 | 16 | 10 | 15 | 0.63 | 0.94 |
| 6/16 | 10 | 26 | 10 | 25 | 0.63 | 1.56 |
| 6/17 | 4 | 30 | 4 | 29 | 0.25 | 1.81 |
| 6/18 | 3 | 33 | 3 | 32 | 0.19 | 2.00 |
| 6/19 | 6 | 39 | 4 | 36 | 0.38 | 2.38 |
| 6/20 | 13 | 52 | 10 | 46 | 0.83 | 3.20 |
| 6/21 | 25 | 77 | 25 | 71 | 1.56 | 4.76 |
| 6/22 | 28 | 105 | 28 | 99 | 1.75 | 6.51 |
| 6/23 | 18 | 123 | 13 | 112 | 1.13 | 7.64 |
| 6/24 | 10 | 133 | 10 | 122 | 0.63 | 8.26 |
| 6/25 | 26 | 159 | 25 | 147 | 1.63 | 9.89 |
| 6/26 | 29 | 188 | 28 | 175 | 1.81 | 11.70 |
| 6/27 | 22 | 210 | 22 | 197 | 1.38 | 13.08 |
| 6/28 | 39 | 249 | 39 | 236 | 2.44 | 15.52 |
| 6/29 | 48 | 297 | 48 | 284 | 3.00 | 18.52 |
| 6/30 | 54 | 351 | 50 | 334 | 3.38 | 21.90 |
| 7/1 | 64 | 415 | 60 | 394 | 4.00 | 25.90 |
| 7/2 | 31 | 446 | 30 | 424 | 1.94 | 27.83 |
| 7/3 | 34 | 480 | 32 | 456 | 2.13 | 29.96 |
| 7/4 | 27 | 507 | 27 | 483 | 1.69 | 31.65 |
| 7/5 | 37 | 544 | 34 | 517 | 2.31 | 33.96 |
| 7/6 | 43 | 587 | 43 | 560 | 2.69 | 36.65 |
| 7/7 | 50 | 637 | 44 | 604 | 3.68 | 40.32 |
| 7/8 | 9 | 646 | 9 | 613 | 0.78 | 41.10 |
| 7/9 | 17 | 663 | 14 | 627 | 1.06 | 42.17 |
| 7/10 | 40 | 703 | 38 | 665 | 2.50 | 44.67 |
| 7/11 | 22 | 725 | 20 | 685 | 1.38 | 46.04 |
| 7/12 | 29 | 754 | 28 | 713 | 1.81 | 47.85 |
| 7/13 | 46 | 800 | 41 | 754 | 2.88 | 50.73 |
| 7/14 | 44 | 844 | 38 | 792 | 2.75 | 53.48 |
| 7/15 | 35 | 879 | 30 | 822 | 2.19 | 55.67 |
| 7/16 | 20 | 899 | 16 | 838 | 1.25 | 56.92 |
| 7/17 | 30 | 929 | 25 | 863 | 1.88 | 58.79 |
| 7/18 | 28 | 957 | 27 | 890 | 1.75 | 60.54 |
| 7/19 | 23 | 980 | 21 | 911 | 1.44 | 61.98 |
| 7/20 | 31 | 1,011 | 28 | 939 | 1.94 | 63.92 |
| 7/21 | 18 | 1,029 | 14 | 953 | 1.13 | 65.04 |
| 7/22 | 33 | 1,077 | 32 | 997 | 2.06 | 68.04 |
| 7/23 | 27 | 1,104 | 26 | 1,023 | 1.69 | 69.73 |
| 7/24 | 25 | 1,129 | 19 | 1,042 | 2.08 | 71.81 |
| 7/25 | 10 | 1,139 | 10 | 1,052 | 1.25 | 73.06 |
| 7/26 | 27 | 1,166 | 25 | 1,077 | 3.38 | 76.44 |
| 7/27 | 14 | 1,180 | 12 | 1,089 | 1.75 | 78.19 |
| 7/28 | 11 | 1,191 | 7 | 1,096 | 1.38 | 79.56 |
| 7/29 | 19 | 1,210 | 15 | 1,111 | 1.58 | 81.15 |
| 7/30 | 21 | 1,231 | 15 | 1,126 | 1.50 | 82.65 |

Appendix B8.–Daily catch, daily marked, and catch-per-unit-of-effort (CPUE) of sockeye salmon captured in the Chilkat River fish wheels, from August 1 to September 30, 2003.

| Date | Daily Sockeye Catch | Cumulative Sockeye Catch | Daily Sockeye Marked | Cumulative Sockeye Marked | Daily CPUE | Cumulative Prop. CPUE |
|---|---|---|---|---|---|---|
| 8/1 | 36 | 1,267 | 32 | 1,158 | 2.25 | 84.90 |
| 8/2 | 49 | 1,316 | 44 | 1,202 | 3.06 | 87.96 |
| 8/3 | 50 | 1,366 | 48 | 1,250 | 3.13 | 91.08 |
| 8/4 | 52 | 1,418 | 48 | 1,298 | 3.25 | 94.33 |
| 8/5 | 47 | 1,465 | 42 | 1,340 | 2.94 | 97.27 |
| 8/6 | 40 | 1,505 | 35 | 1,375 | 2.50 | 99.77 |
| 8/7 | 60 | 1,565 | 54 | 1,429 | 3.75 | 103.52 |
| 8/8 | 90 | 1,655 | 89 | 1,518 | 5.63 | 109.15 |
| 8/9 | 75 | 1,730 | 75 | 1,593 | 4.89 | 114.04 |
| 8/10 | 84 | 1,814 | 78 | 1,671 | 5.25 | 119.29 |
| 8/11 | 73 | 1,887 | 68 | 1,739 | 4.56 | 123.85 |
| 8/12 | 111 | 1,998 | 107 | 1,846 | 6.94 | 130.79 |
| 8/13 | 87 | 2,085 | 81 | 1,927 | 5.44 | 136.23 |
| 8/14 | 85 | 2,170 | 80 | 2,007 | 5.31 | 141.54 |
| 8/15 | 68 | 2,238 | 66 | 2,073 | 4.25 | 145.79 |
| 8/16 | 19 | 2,257 | 19 | 2,092 | 1.25 | 147.04 |
| 8/17 | 17 | 2,274 | 16 | 2,108 | 1.06 | 148.10 |
| 8/18 | 43 | 2,317 | 41 | 2,149 | 2.69 | 150.79 |
| 8/19 | 95 | 2,412 | 89 | 2,238 | 5.94 | 156.73 |
| 8/20 | 125 | 2,537 | 118 | 2,356 | 7.81 | 164.54 |
| 8/21 | 72 | 2,609 | 69 | 2,425 | 4.50 | 169.04 |
| 8/22 | 68 | 2,677 | 63 | 2,488 | 4.25 | 173.29 |
| 8/23 | 71 | 2,748 | 69 | 2,557 | 5.07 | 178.36 |
| 8/24 | 76 | 2,824 | 75 | 2,632 | 4.75 | 183.11 |
| 8/25 | 79 | 2,903 | 76 | 2,708 | 4.84 | 187.95 |
| 8/26 | 62 | 2,965 | 60 | 2,768 | 3.72 | 191.67 |
| 8/27 | 90 | 3,055 | 84 | 2,852 | 5.29 | 196.96 |
| 8/28 | 81 | 3,136 | 80 | 2,932 | 6.08 | 203.04 |
| 8/29 | 38 | 3,174 | 38 | 2,970 | 3.59 | 206.63 |
| 8/30 | 72 | 3,246 | 72 | 3,042 | 4.50 | 211.13 |
| 8/31 | 44 | 3,290 | 44 | 3,086 | 2.75 | 213.88 |
| 9/1 | 83 | 3,373 | 80 | 3,166 | 5.19 | 219.07 |
| 9/2 | 113 | 3,486 | 105 | 3,271 | 7.06 | 226.13 |
| 9/3 | 49 | 3,535 | 48 | 3,319 | 3.06 | 229.19 |
| 9/4 | 91 | 3,626 | 46 | 3,365 | 5.69 | 234.88 |
| 9/5 | 43 | 3,669 | 35 | 3,400 | 3.91 | 238.79 |
| 9/6 | 67 | 3,736 | 57 | 3,457 | 4.19 | 242.97 |
| 9/7 | 62 | 3,798 | 57 | 3,514 | 3.88 | 246.85 |
| 9/8 | 50 | 3,848 | 36 | 3,550 | 3.13 | 249.97 |
| 9/9 | 84 | 3,932 | 36 | 3,586 | 5.25 | 255.22 |
| 9/10 | 60 | 3,992 | 22 | 3,608 | 4.34 | 259.56 |
| 9/11 | 52 | 4,044 | 44 | 3,652 | 3.25 | 262.81 |
| 9/12 | 38 | 4,082 | 37 | 3,689 | 2.38 | 265.19 |
| 9/13 | 22 | 4,104 | 22 | 3,711 | 1.38 | 266.56 |
| 9/14 | 24 | 4,128 | 14 | 3,725 | 1.85 | 268.41 |
| 9/15 | 21 | 4,149 | 18 | 3,743 | 4.20 | 272.61 |
| 9/16 | 33 | 4,182 | 33 | 3,776 | 2.15 | 274.76 |
| 9/17 | 20 | 4,202 | 19 | 3,795 | 1.25 | 276.01 |
| 9/18 | 19 | 4,221 | 19 | 3,814 | 1.19 | 277.20 |
| 9/19 | 23 | 4,244 | 23 | 3,837 | 1.44 | 278.64 |
| 9/20 | 35 | 4,279 | 35 | 3,872 | 2.19 | 280.82 |
| 9/21 | 28 | 4,307 | 28 | 3,900 | 1.75 | 282.57 |
| 9/22 | 27 | 4,334 | 25 | 3,925 | 1.69 | 284.26 |
| 9/23 | 20 | 4,354 | 20 | 3,945 | 1.25 | 285.51 |
| 9/24 | 19 | 4,373 | 16 | 3,961 | 1.19 | 286.70 |
| 9/25 | 13 | 4,386 | 13 | 3,974 | 0.81 | 287.51 |
| 9/26 | 17 | 4,403 | 14 | 3,988 | 1.06 | 288.57 |
| 9/27 | 6 | 4,409 | 6 | 3,994 | 0.38 | 288.95 |
| 9/28 | 21 | 4,430 | 21 | 4,015 | 1.31 | 290.26 |
| 9/29 | 11 | 4,441 | 0 | 4,015 | 0.69 | 290.95 |
| 9/30 | 16 | 4,457 | 0 | 4,015 | 1.00 | 291.95 |

Appendix B9.–Daily catch, daily marked, and CPUE of sockeye salmon captured in the Chilkat River fish wheels, from October 1 to October 21 (end of season), 2003.

| Date | Daily Sockeye Catch | Cumulative Sockeye Catch | Daily Sockeye Marked | Cumulative Sockeye Marked | Daily CPUE | Cumulative Prop. CPUE |
|---|---|---|---|---|---|---|
| 10/1 | 11 | 4,468 | 0 | 4,015 | 0.73 | 292.68 |
| 10/2 | 8 | 4,476 | 0 | 4,015 | 0.50 | 293.18 |
| 10/3 | 10 | 4,486 | 0 | 4,015 | 0.63 | 293.81 |
| 10/4 | 3 | 4,489 | 0 | 4,015 | 0.19 | 293.99 |
| 10/5 | 2 | 4,491 | 0 | 4,015 | 0.14 | 294.13 |
| 10/6 | 6 | 4,497 | 0 | 4,015 | 0.38 | 294.51 |
| 10/7 | 1 | 4,498 | 0 | 4,015 | 0.06 | 294.57 |
| 10/8 | 5 | 4,503 | 0 | 4,015 | 0.31 | 294.88 |
| 10/9 | 10 | 4,513 | 0 | 4,015 | 0.68 | 295.56 |
| 10/10 | 5 | 4,518 | 0 | 4,015 | 0.33 | 295.89 |
| 10/11 | 10 | 4,528 | 0 | 4,015 | 0.63 | 296.51 |
| 10/12 | 3 | 4,531 | 0 | 4,015 | 0.19 | 296.70 |
| 10/13 | 4 | 4,535 | 0 | 4,015 | 0.25 | 296.95 |
| 10/14 | 7 | 4,542 | 0 | 4,015 | 0.44 | 297.39 |
| 10/15 | 2 | 4,544 | 2 | 4,017 | 0.13 | 297.51 |
| 10/16 | 2 | 4,546 | 0 | 4,017 | 0.13 | 297.64 |
| 10/17 | 0 | 4,546 | 0 | 4,017 | 0.00 | 297.64 |
| 10/18 | 0 | 4,546 | 0 | 4,017 | 0.00 | 297.64 |
| 10/19 | 3 | 4,549 | 0 | 4,017 | 0.38 | 298.01 |
| 10/20 | 1 | 4,550 | 0 | 4,017 | 0.20 | 298.21 |
| 10/21 | 1 | 4,551 | 0 | 4,017 | 0.13 | 298.34 |

Appendix B10.–Daily catch, daily marked, and catch-per-unit-of-effort (CPUE) of sockeye salmon captured in the Chilkat River fish wheels June 8 to July 31, 2004.

| Date | Daily Sockeye Catch | Cumulative Sockeye Catch | Daily Sockeye Marked | Cumulative Sockeye Marked | Daily CPUE | Cumulative Prop. CPUE |
|---|---|---|---|---|---|---|
| 6/8 | 1 | 1 | 1 | 1 | 0.06 | 0.06 |
| 6/9 | 0 | 1 | 0 | 1 | 0.00 | 0.06 |
| 6/10 | 1 | 2 | 0 | 1 | 0.06 | 0.13 |
| 6/11 | 0 | 2 | 0 | 1 | 0.00 | 0.13 |
| 6/12 | 2 | 4 | 2 | 3 | 0.13 | 0.25 |
| 6/13 | 6 | 10 | 6 | 9 | 0.38 | 0.63 |
| 6/14 | 7 | 17 | 7 | 16 | 0.44 | 1.06 |
| 6/15 | 2 | 19 | 2 | 18 | 0.13 | 1.19 |
| 6/16 | 1 | 20 | 1 | 19 | 0.06 | 1.25 |
| 6/17 | 7 | 27 | 4 | 23 | 0.44 | 1.69 |
| 6/18 | 2 | 29 | 2 | 25 | 0.13 | 1.81 |
| 6/19 | 1 | 30 | 1 | 26 | 0.06 | 1.88 |
| 6/20 | 0 | 30 | 0 | 26 | 0.00 | 1.88 |
| 6/21 | 13 | 43 | 10 | 36 | 0.81 | 2.69 |
| 6/22 | 14 | 57 | 14 | 50 | 0.88 | 3.56 |
| 6/23 | 23 | 80 | 21 | 71 | 1.44 | 5.00 |
| 6/24 | 15 | 95 | 14 | 85 | 0.94 | 5.94 |
| 6/25 | 21 | 116 | 18 | 103 | 1.31 | 7.25 |
| 6/26 | 24 | 140 | 24 | 127 | 1.50 | 8.75 |
| 6/27 | 42 | 182 | 41 | 168 | 2.63 | 11.38 |
| 6/28 | 39 | 221 | 38 | 206 | 3.04 | 14.41 |
| 6/29 | 33 | 254 | 27 | 233 | 2.06 | 16.48 |
| 6/30 | 30 | 284 | 24 | 257 | 1.88 | 18.35 |
| 7/1 | 44 | 328 | 44 | 301 | 2.84 | 21.19 |
| 7/2 | 38 | 366 | 35 | 336 | 2.38 | 23.57 |
| 7/3 | 38 | 404 | 38 | 374 | 2.38 | 25.94 |
| 7/4 | 55 | 459 | 53 | 427 | 3.44 | 29.38 |
| 7/5 | 52 | 511 | 50 | 477 | 3.25 | 32.63 |
| 7/6 | 51 | 562 | 43 | 520 | 3.19 | 35.82 |
| 7/7 | 42 | 604 | 30 | 550 | 2.63 | 38.44 |
| 7/8 | 39 | 643 | 31 | 581 | 2.44 | 40.88 |
| 7/9 | 70 | 713 | 68 | 649 | 4.38 | 45.25 |
| 7/10 | 86 | 799 | 84 | 733 | 5.38 | 50.63 |
| 7/11 | 84 | 883 | 83 | 816 | 5.25 | 55.88 |
| 7/12 | 99 | 982 | 90 | 906 | 6.19 | 62.07 |
| 7/13 | 62 | 1,044 | 60 | 966 | 3.88 | 65.94 |
| 7/14 | 30 | 1,074 | 25 | 991 | 1.88 | 67.82 |
| 7/15 | 35 | 1,109 | 26 | 1,017 | 2.19 | 70.00 |
| 7/16 | 30 | 1,139 | 27 | 1,044 | 1.88 | 71.88 |
| 7/17 | 56 | 1,195 | 56 | 1,100 | 3.50 | 75.38 |
| 7/18 | 78 | 1,273 | 76 | 1,176 | 4.88 | 80.25 |
| 7/19 | 66 | 1,339 | 58 | 1,234 | 4.13 | 84.38 |
| 7/20 | 54 | 1,393 | 51 | 1,285 | 3.38 | 87.75 |
| 7/21 | 31 | 1,424 | 23 | 1,308 | 1.94 | 89.69 |
| 7/22 | 22 | 1,446 | 15 | 1,323 | 1.38 | 91.07 |
| 7/23 | 28 | 1,474 | 27 | 1,350 | 1.75 | 92.82 |
| 7/24 | 26 | 1,500 | 26 | 1,376 | 1.63 | 94.44 |
| 7/25 | 85 | 1,585 | 84 | 1,460 | 5.31 | 99.75 |
| 7/26 | 79 | 1,664 | 73 | 1,533 | 4.94 | 104.69 |
| 7/27 | 27 | 1,691 | 25 | 1,558 | 1.69 | 106.38 |
| 7/28 | 25 | 1,716 | 20 | 1,578 | 1.56 | 107.94 |
| 7/29 | 27 | 1,743 | 25 | 1,603 | 1.76 | 109.70 |
| 7/30 | 36 | 1,779 | 30 | 1,633 | 2.25 | 111.95 |
| 7/31 | 73 | 1,852 | 68 | 1,701 | 4.56 | 116.51 |

Appendix B11.–Daily catch, daily marked, and catch-per-unit-of-effort (CPUE) of sockeye salmon captured in the Chilkat River fish wheels August 1 to September 30, 2004.

| Date | Daily Sockeye Catch | Cumulative Sockeye Catch | Daily Sockeye Marked | Cumulative Sockeye Marked | Daily CPUE | Cumulative Prop. CPUE |
|---|---|---|---|---|---|---|
| 8/1 | 94 | 1,946 | 93 | 1,794 | 5.88 | 122.39 |
| 8/2 | 78 | 2,024 | 68 | 1,862 | 4.88 | 127.26 |
| 8/3 | 78 | 2,102 | 76 | 1,938 | 4.88 | 132.14 |
| 8/4 | 81 | 2,183 | 73 | 2,011 | 5.06 | 137.20 |
| 8/5 | 75 | 2,258 | 67 | 2,078 | 4.69 | 141.89 |
| 8/6 | 105 | 2,363 | 98 | 2,176 | 8.40 | 150.29 |
| 8/7 | 77 | 2,440 | 76 | 2,252 | 4.81 | 155.10 |
| 8/8 | 100 | 2,540 | 96 | 2,348 | 12.50 | 167.60 |
| 8/9 | 104 | 2,644 | 93 | 2,441 | 13.00 | 180.60 |
| 8/10 | 63 | 2,707 | 61 | 2,502 | 7.88 | 188.48 |
| 8/11 | 73 | 2,780 | 64 | 2,566 | 6.74 | 195.21 |
| 8/12 | 56 | 2,836 | 49 | 2,615 | 3.50 | 198.71 |
| 8/13 | 24 | 2,860 | 24 | 2,639 | 1.50 | 200.21 |
| 8/14 | 61 | 2,921 | 59 | 2,698 | 3.81 | 204.03 |
| 8/15 | 61 | 2,982 | 61 | 2,759 | 3.81 | 207.84 |
| 8/16 | 69 | 3,051 | 57 | 2,816 | 4.31 | 212.15 |
| 8/17 | 56 | 3,107 | 56 | 2,872 | 3.50 | 215.65 |
| 8/18 | 69 | 3,176 | 58 | 2,930 | 4.31 | 219.96 |
| 8/19 | 65 | 3,241 | 60 | 2,990 | 4.06 | 224.03 |
| 8/20 | 79 | 3,320 | 79 | 3,069 | 4.94 | 228.96 |
| 8/21 | 49 | 3,369 | 47 | 3,116 | 3.06 | 232.03 |
| 8/22 | 27 | 3,396 | 27 | 3,143 | 1.69 | 233.71 |
| 8/23 | 45 | 3,441 | 39 | 3,182 | 3.25 | 236.97 |
| 8/24 | 74 | 3,515 | 71 | 3,253 | 4.63 | 241.59 |
| 8/25 | 51 | 3,566 | 43 | 3,296 | 3.40 | 244.99 |
| 8/26 | 39 | 3,605 | 32 | 3,328 | 3.00 | 247.99 |
| 8/27 | 49 | 3,654 | 48 | 3,376 | 3.06 | 251.06 |
| 8/28 | 52 | 3,706 | 51 | 3,427 | 3.25 | 254.31 |
| 8/29 | 53 | 3,759 | 53 | 3,480 | 3.31 | 257.62 |
| 8/30 | 52 | 3,811 | 46 | 3,526 | 3.25 | 260.87 |
| 8/31 | 58 | 3,869 | 58 | 3,584 | 3.63 | 264.49 |
| 9/1 | 57 | 3,926 | 51 | 3,635 | 3.56 | 268.06 |
| 9/2 | 63 | 3,989 | 58 | 3,693 | 3.94 | 271.99 |
| 9/3 | 37 | 4,026 | 37 | 3,730 | 2.31 | 274.31 |
| 9/4 | 32 | 4,058 | 32 | 3,762 | 2.00 | 276.31 |
| 9/5 | 28 | 4,086 | 27 | 3,789 | 1.75 | 278.06 |
| 9/6 | 19 | 4,105 | 19 | 3,808 | 1.19 | 279.24 |
| 9/7 | 3 | 4,108 | 3 | 3,811 | 0.19 | 279.43 |
| 9/8 | 10 | 4,118 | 3 | 3,814 | 0.63 | 280.06 |
| 9/9 | 5 | 4,123 | 1 | 3,815 | 0.31 | 280.37 |
| 9/10 | 8 | 4,131 | 4 | 3,819 | 0.50 | 280.87 |
| 9/11 | 8 | 4,139 | 8 | 3,827 | 0.50 | 281.37 |
| 9/12 | 15 | 4,154 | 15 | 3,842 | 0.94 | 282.31 |
| 9/13 | 10 | 4,164 | 4 | 3,846 | 0.63 | 282.93 |
| 9/14 | 12 | 4,176 | 12 | 3,858 | 0.75 | 283.68 |
| 9/15 | 13 | 4,189 | 8 | 3,866 | 0.81 | 284.49 |
| 9/16 | 6 | 4,195 | 6 | 3,872 | 0.38 | 284.87 |
| 9/17 | 12 | 4,207 | 12 | 3,884 | 0.75 | 285.62 |
| 9/18 | 6 | 4,213 | 6 | 3,890 | 0.38 | 285.99 |
| 9/19 | 11 | 4,224 | 11 | 3,901 | 0.69 | 286.68 |
| 9/20 | 16 | 4,240 | 16 | 3,917 | 1.00 | 287.68 |
| 9/21 | 15 | 4,255 | 15 | 3,932 | 1.02 | 288.70 |
| 9/22 | 0 | 4,255 | 0 | 3,932 | 0.00 | 288.70 |
| 9/23 | 2 | 4,257 | 2 | 3,934 | 0.13 | 288.83 |
| 9/24 | 1 | 4,258 | 1 | 3,935 | 0.06 | 288.89 |
| 9/25 | 8 | 4,266 | 8 | 3,943 | 0.67 | 289.56 |
| 9/26 | 9 | 4,275 | 9 | 3,952 | 0.56 | 290.12 |
| 9/27 | 3 | 4,278 | 3 | 3,955 | 0.19 | 290.31 |
| 9/28 | 1 | 4,279 | 1 | 3,956 | 0.06 | 290.37 |
| 9/29 | 11 | 4,290 | 11 | 3,967 | 0.69 | 291.06 |
| 9/30 | 12 | 4,302 | 12 | 3,979 | 0.75 | 291.81 |

Appendix B12.–Daily catch, daily marked, and catch-per-unit-of-effort (CPUE) of sockeye salmon captured in the Chilkat River fish wheels October 1 to October 19 (end of season), 2004.

| Date | Daily Sockeye Catch | Cumulative Sockeye Catch | Daily Sockeye Marked | Cumulative Sockeye Marked | Daily CPUE | Cumulative Prop. CPUE |
|---|---|---|---|---|---|---|
| 10/1 | 10 | 4,312 | 10 | 3,989 | 0.63 | 292.43 |
| 10/2 | 9 | 4,321 | 9 | 3,998 | 0.56 | 292.99 |
| 10/3 | 1 | 4,322 | 1 | 3,999 | 0.06 | 293.06 |
| 10/4 | 6 | 4,328 | 6 | 4,005 | 0.38 | 293.43 |
| 10/5 | 4 | 4,332 | 4 | 4,009 | 0.25 | 293.68 |
| 10/6 | 0 | 4,332 | 0 | 4,009 | 0.00 | 293.68 |
| 10/7 | 6 | 4,338 | 6 | 4,015 | 0.38 | 294.06 |
| 10/8 | 5 | 4,343 | 5 | 4,020 | 0.31 | 294.37 |
| 10/9 | 8 | 4,351 | 8 | 4,028 | 0.50 | 294.87 |
| 10/10 | 3 | 4,354 | 3 | 4,031 | 0.19 | 295.06 |
| 10/11 | 5 | 4,359 | 5 | 4,036 | 0.31 | 295.37 |
| 10/12 | 1 | 4,360 | 1 | 4,037 | 0.06 | 295.43 |
| 10/13 | 1 | 4,361 | 0 | 4,037 | 0.06 | 295.49 |
| 10/14 | 1 | 4,362 | 0 | 4,037 | 0.06 | 295.56 |
| 10/15 | 0 | 4,362 | 0 | 4,037 | 0.00 | 295.56 |
| 10/16 | 1 | 4,363 | 0 | 4,037 | 0.06 | 295.62 |
| 10/17 | 1 | 4,364 | 0 | 4,037 | 0.06 | 295.68 |
| 10/18 | 1 | 4,365 | 0 | 4,037 | 0.06 | 295.74 |
| 10/19 | 1 | 4,366 | 0 | 4,037 | 0.13 | 295.87 |

Appendix B13.–Daily sockeye salmon counts, and daily numbers of marked and unmarked sockeye salmon sampled at the Chilkat Lake weir, from July 6 to August 31, 2004.

| Date | Daily sockeye Sockeye Count | Cumulative Sockeye count | Daily Sockeye Sampled | Cumulative Sockeye Sampled | Marked Sockeye | Cumulative Marked Sockeye |
|---|---|---|---|---|---|---|
| 7/6 | 58 | 58 | 0 | 0 | 0 | 0 |
| 7/7 | 82 | 140 | 0 | 0 | 0 | 0 |
| 7/8 | 0 | 140 | 0 | 0 | 0 | 0 |
| 7/9 | 30 | 170 | 30 | 30 | 1 | 1 |
| 7/10 | 878 | 1,048 | 146 | 176 | 4 | 5 |
| 7/11 | 500 | 1,548 | 0 | 176 | 0 | 5 |
| 7/12 | 526 | 2,074 | 80 | 256 | 1 | 6 |
| 7/13 | 243 | 2,317 | 243 | 499 | 4 | 10 |
| 7/14 | 1,918 | 4,235 | 0 | 499 | 0 | 10 |
| 7/15 | 188 | 4,423 | 188 | 687 | 4 | 14 |
| 7/16 | 128 | 4,551 | 128 | 815 | 2 | 16 |
| 7/17 | 1,626 | 6,177 | 105 | 920 | 2 | 18 |
| 7/18 | 1,717 | 7,894 | 106 | 1,026 | 0 | 18 |
| 7/19 | 1,340 | 9,234 | 203 | 1,229 | 4 | 22 |
| 7/20 | 211 | 9,445 | 105 | 1,334 | 4 | 26 |
| 7/21 | 2,320 | 11,765 | 201 | 1,535 | 2 | 28 |
| 7/22 | 1,463 | 13,228 | 148 | 1,683 | 0 | 28 |
| 7/23 | 972 | 14,200 | 63 | 1,746 | 0 | 28 |
| 7/24 | 400 | 14,600 | 67 | 1,813 | 3 | 31 |
| 7/25 | 1,903 | 16,503 | 136 | 1,949 | 3 | 34 |
| 7/26 | 2,165 | 18,668 | 136 | 2,085 | 2 | 36 |
| 7/27 | 1,267 | 19,935 | 56 | 2,141 | 2 | 38 |
| 7/28 | 1,110 | 21,045 | 77 | 2,218 | 4 | 42 |
| 7/29 | 4 | 21,049 | 4 | 2,222 | 0 | 42 |
| 7/30 | 0 | 21,049 | 0 | 2,222 | 0 | 42 |
| 7/31 | 56 | 21,105 | 56 | 2,278 | 0 | 42 |
| 8/1 | 418 | 21,523 | 166 | 2,444 | 3 | 45 |
| 8/2 | 378 | 21,901 | 0 | 2,444 | 0 | 45 |
| 8/3 | 142 | 22,043 | 65 | 2,509 | 0 | 45 |
| 8/4 | 1,150 | 23,193 | 95 | 2,604 | 0 | 45 |
| 8/5 | 330 | 23,523 | 46 | 2,650 | 2 | 47 |
| 8/6 | 352 | 23,875 | 141 | 2,791 | 3 | 50 |
| 8/7 | 84 | 23,959 | 84 | 2,875 | 1 | 51 |
| 8/8 | 167 | 24,126 | 167 | 3,042 | 0 | 51 |
| 8/9 | 1,963 | 26,089 | 149 | 3,191 | 1 | 52 |
| 8/10 | 1,286 | 27,375 | 100 | 3,291 | 7 | 59 |
| 8/11 | 638 | 28,013 | 87 | 3,378 | 2 | 61 |
| 8/12 | 1,264 | 29,277 | 57 | 3,435 | 2 | 63 |
| 8/13 | 304 | 29,581 | 15 | 3,450 | 1 | 64 |
| 8/14 | 447 | 30,028 | 46 | 3,496 | 1 | 65 |
| 8/15 | 1,548 | 31,576 | 153 | 3,649 | 9 | 74 |
| 8/16 | 155 | 31,731 | 0 | 3,649 | 0 | 74 |
| 8/17 | 0 | 31,731 | 0 | 3,649 | 0 | 74 |
| 8/18 | 0 | 31,731 | 0 | 3,649 | 0 | 74 |
| 8/19 | 102 | 31,833 | 102 | 3,751 | 6 | 80 |
| 8/20 | 590 | 32,423 | 144 | 3,895 | 8 | 88 |
| 8/21 | 85 | 32,508 | 63 | 3,958 | 3 | 91 |
| 8/22 | 0 | 32,508 | 0 | 3,958 | 0 | 91 |
| 8/23 | 0 | 32,508 | 0 | 3,958 | 0 | 91 |
| 8/24 | 1,011 | 33,519 | 158 | 4,116 | 3 | 94 |
| 8/25 | 345 | 33,864 | 45 | 4,161 | 1 | 95 |
| 8/26 | 578 | 34,442 | 179 | 4,340 | 8 | 103 |
| 8/27 | 323 | 34,765 | 154 | 4,494 | 4 | 107 |
| 8/28 | 1,471 | 36,236 | 103 | 4,597 | 6 | 113 |
| 8/29 | 897 | 37,133 | 110 | 4,707 | 7 | 120 |
| 8/30 | 9 | 37,142 | 0 | 4,707 | 0 | 120 |
| 8/31 | 98 | 37,240 | 65 | 4,772 | 4 | 124 |

Appendix B14.–Daily sockeye salmon counts, and daily numbers of marked and unmarked sockeye salmon sampled at the Chilkat Lake weir, from September 1 to October 13 (end of season), 2004.

| Date | Daily sockeye Sockeye Count | Cumulative Sockeye count | Daily Sockeye Sampled | Cumulative Sockeye Sampled | Marked Sockeye | Cumulative Marked Sockeye |
|---|---|---|---|---|---|---|
| 9/1 | 1,086 | 38,326 | 151 | 4,923 | 4 | 128 |
| 9/2 | 1,361 | 39,687 | 93 | 5,016 | 5 | 133 |
| 9/3 | 1,346 | 41,033 | 96 | 5,112 | 4 | 137 |
| 9/4 | 209 | 41,242 | 155 | 5,267 | 5 | 142 |
| 9/5 | 1,297 | 42,539 | 101 | 5,368 | 1 | 143 |
| 9/6 | 1,821 | 44,360 | 48 | 5,416 | 2 | 145 |
| 9/7 | 622 | 44,982 | 124 | 5,540 | 9 | 154 |
| 9/8 | 2,704 | 47,686 | 72 | 5,612 | 0 | 154 |
| 9/9 | 1,965 | 49,651 | 0 | 5,612 | 0 | 154 |
| 9/10 | 1,426 | 51,077 | 209 | 5,821 | 5 | 159 |
| 9/11 | 1,892 | 52,969 | 116 | 5,937 | 7 | 166 |
| 9/12 | 1,319 | 54,288 | 203 | 6,140 | 6 | 172 |
| 9/13 | 604 | 54,892 | 206 | 6,346 | 4 | 176 |
| 9/14 | 2,283 | 57,175 | 160 | 6,506 | 5 | 181 |
| 9/15 | 700 | 57,875 | 156 | 6,662 | 2 | 183 |
| 9/16 | 1,978 | 59,853 | 88 | 6,750 | 3 | 186 |
| 9/17 | 1,303 | 61,156 | 339 | 7,089 | 4 | 190 |
| 9/18 | 1,333 | 62,489 | 149 | 7,238 | 3 | 193 |
| 9/19 | 1,636 | 64,125 | 183 | 7,421 | 2 | 195 |
| 9/20 | 213 | 64,338 | 213 | 7,634 | 2 | 197 |
| 9/21 | 1,226 | 65,564 | 240 | 7,874 | 2 | 199 |
| 9/22 | 2,147 | 67,711 | 351 | 8,225 | 3 | 202 |
| 9/23 | 171 | 67,882 | 138 | 8,363 | 0 | 202 |
| 9/24 | 768 | 68,650 | 116 | 8,479 | 2 | 204 |
| 9/25 | 919 | 69,569 | 33 | 8,512 | 0 | 204 |
| 9/26 | 0 | 69,569 | 0 | 8,512 | 0 | 204 |
| 9/27 | 0 | 69,569 | 0 | 8,512 | 0 | 204 |
| 9/28 | 0 | 69,569 | 0 | 8,512 | 0 | 204 |
| 9/29 | 55 | 69,624 | 55 | 8,567 | 1 | 205 |
| 9/30 | 103 | 69,727 | 42 | 8,609 | 1 | 206 |
| 10/1 | 458 | 70,185 | 210 | 8,819 | 3 | 209 |
| 10/2 | 1,095 | 71,280 | 74 | 8,893 | 3 | 212 |
| 10/3 | 930 | 72,210 | 71 | 8,964 | 0 | 212 |
| 10/4 | 31 | 72,241 | 31 | 8,995 | 1 | 213 |
| 10/5 | 199 | 72,440 | 140 | 9,135 | 5 | 218 |
| 10/6 | 809 | 73,249 | 92 | 9,227 | 2 | 220 |
| 10/7 | 442 | 73,691 | 0 | 9,227 | 0 | 220 |
| 10/8 | 288 | 73,979 | 51 | 9,278 | 0 | 220 |
| 10/9 | 146 | 74,125 | 32 | 9,310 | 0 | 220 |
| 10/10 | 340 | 74,465 | 33 | 9,343 | 1 | 221 |
| 10/11 | 576 | 75,041 | 44 | 9,387 | 0 | 221 |
| 10/12 | 261 | 75,302 | 33 | 9,420 | 0 | 221 |
| 10/13 | 330 | 75,632 | 0 | 9,420 | 0 | 221 |

Appendix B15.–Daily catch, daily marked, and catch-per-unit-of-effort (CPUE) of chum salmon captured in the Chilkat River fish wheels July 15 to August 31, 2003.

| Date | Daily Chum Catch | Cumulative Chum Catch | Daily Chum tagged | Cumulative Chum Tagged | Daily CPUE | Cumulative Proportion CPUE |
|---|---|---|---|---|---|---|
| 7/15 | 1 | 1 | 1 | 1 | 0.06 | 0.06 |
| 7/16 | 1 | 2 | 1 | 2 | 0.06 | 0.13 |
| 7/17 | 0 | 2 | 0 | 2 | 0.00 | 0.13 |
| 7/18 | 1 | 3 | 1 | 3 | 0.06 | 0.19 |
| 7/19 | 2 | 5 | 2 | 5 | 0.13 | 0.31 |
| 7/20 | 0 | 5 | 0 | 5 | 0.00 | 0.31 |
| 7/21 | 1 | 6 | 1 | 6 | 0.06 | 0.38 |
| 7/22 | 0 | 6 | 0 | 6 | 0.00 | 0.38 |
| 7/23 | 4 | 10 | 4 | 10 | 0.25 | 0.63 |
| 7/24 | 2 | 12 | 1 | 11 | 0.13 | 0.75 |
| 7/25 | 2 | 14 | 2 | 13 | 0.17 | 0.92 |
| 7/26 | 2 | 16 | 2 | 15 | 0.25 | 1.17 |
| 7/27 | 3 | 19 | 3 | 18 | 0.38 | 1.54 |
| 7/28 | 1 | 20 | 1 | 19 | 0.13 | 1.67 |
| 7/29 | 0 | 20 | 0 | 19 | 0.00 | 1.67 |
| 7/30 | 1 | 21 | 1 | 20 | 0.08 | 1.75 |
| 7/31 | 3 | 24 | 3 | 23 | 0.21 | 1.96 |
| 8/1 | 3 | 27 | 3 | 26 | 0.19 | 2.15 |
| 8/2 | 0 | 27 | 0 | 26 | 0.00 | 2.15 |
| 8/3 | 6 | 33 | 6 | 32 | 0.38 | 2.53 |
| 8/4 | 7 | 40 | 7 | 39 | 0.44 | 2.96 |
| 8/5 | 0 | 40 | 0 | 39 | 0.00 | 2.96 |
| 8/6 | 5 | 45 | 5 | 44 | 0.31 | 3.28 |
| 8/7 | 7 | 52 | 7 | 51 | 0.44 | 3.71 |
| 8/8 | 16 | 68 | 16 | 67 | 1.00 | 4.71 |
| 8/9 | 10 | 78 | 9 | 76 | 0.65 | 5.37 |
| 8/10 | 11 | 89 | 11 | 87 | 0.69 | 6.05 |
| 8/11 | 24 | 113 | 24 | 111 | 1.50 | 7.55 |
| 8/12 | 21 | 134 | 21 | 132 | 1.31 | 8.87 |
| 8/13 | 17 | 151 | 17 | 149 | 1.06 | 9.93 |
| 8/14 | 13 | 164 | 13 | 162 | 0.81 | 10.74 |
| 8/15 | 15 | 179 | 14 | 176 | 0.94 | 11.68 |
| 8/16 | 5 | 184 | 5 | 181 | 0.33 | 12.01 |
| 8/17 | 8 | 192 | 8 | 189 | 0.50 | 12.51 |
| 8/18 | 13 | 205 | 13 | 202 | 0.81 | 13.32 |
| 8/19 | 32 | 237 | 28 | 230 | 2.00 | 15.32 |
| 8/20 | 28 | 265 | 28 | 258 | 1.75 | 17.07 |
| 8/21 | 60 | 325 | 59 | 317 | 3.75 | 20.82 |
| 8/22 | 90 | 415 | 90 | 407 | 5.63 | 26.45 |
| 8/23 | 73 | 488 | 73 | 480 | 5.21 | 31.66 |
| 8/24 | 36 | 524 | 36 | 516 | 2.25 | 33.91 |
| 8/25 | 27 | 551 | 27 | 543 | 1.65 | 35.56 |
| 8/26 | 58 | 609 | 57 | 600 | 3.48 | 39.04 |
| 8/27 | 39 | 648 | 39 | 639 | 2.29 | 41.34 |
| 8/28 | 32 | 680 | 32 | 671 | 2.40 | 43.74 |
| 8/29 | 42 | 722 | 42 | 713 | 3.97 | 47.71 |
| 8/30 | 105 | 827 | 105 | 818 | 6.56 | 54.27 |
| 8/31 | 39 | 866 | 39 | 857 | 2.44 | 56.71 |

Appendix B16.–Daily catch, daily marked, and catch-per-unit-of-effort (CPUE) of chum salmon captured in the Chilkat River fish wheels September 1 to October 21 (end of season), 2003.

| Date | Daily Chum Catch | Cumulative Chum Catch | Daily Chum tagged | Cumulative Chum Tagged | Daily CPUE | Cumulative Proportion CPUE |
|---|---|---|---|---|---|---|
| 9/1 | 32 | 898 | 32 | 889 | 2.00 | 58.71 |
| 9/2 | 59 | 957 | 59 | 948 | 3.69 | 62.39 |
| 9/3 | 29 | 986 | 27 | 975 | 1.81 | 64.21 |
| 9/4 | 92 | 1,078 | 36 | 1,011 | 5.75 | 69.96 |
| 9/5 | 80 | 1,158 | 68 | 1,079 | 7.27 | 77.23 |
| 9/6 | 147 | 1,305 | 117 | 1,196 | 9.19 | 86.42 |
| 9/7 | 150 | 1,455 | 138 | 1,334 | 9.38 | 95.79 |
| 9/8 | 50 | 1,505 | 40 | 1,374 | 3.13 | 98.92 |
| 9/9 | 172 | 1,677 | 58 | 1,432 | 10.75 | 109.67 |
| 9/10 | 123 | 1,800 | 77 | 1,509 | 8.89 | 118.56 |
| 9/11 | 78 | 1,878 | 77 | 1,586 | 4.88 | 123.43 |
| 9/12 | 40 | 1,918 | 40 | 1,626 | 2.50 | 125.93 |
| 9/13 | 52 | 1,970 | 40 | 1,666 | 3.25 | 129.18 |
| 9/14 | 68 | 2,038 | 55 | 1,721 | 5.23 | 134.41 |
| 9/15 | 39 | 2,077 | 39 | 1,760 | 7.80 | 142.21 |
| 9/16 | 56 | 2,133 | 56 | 1,816 | 3.65 | 145.87 |
| 9/17 | 29 | 2,162 | 27 | 1,843 | 1.81 | 147.68 |
| 9/18 | 27 | 2,189 | 26 | 1,869 | 1.69 | 149.37 |
| 9/19 | 37 | 2,226 | 36 | 1,905 | 2.31 | 151.68 |
| 9/20 | 35 | 2,261 | 35 | 1,940 | 2.19 | 153.87 |
| 9/21 | 53 | 2,314 | 51 | 1,991 | 3.31 | 157.18 |
| 9/22 | 38 | 2,352 | 38 | 2,029 | 2.38 | 159.55 |
| 9/23 | 31 | 2,383 | 30 | 2,059 | 1.94 | 161.49 |
| 9/24 | 21 | 2,404 | 20 | 2,079 | 1.31 | 162.80 |
| 9/25 | 42 | 2,446 | 42 | 2,121 | 2.63 | 165.43 |
| 9/26 | 56 | 2,502 | 50 | 2,171 | 3.50 | 168.93 |
| 9/27 | 29 | 2,531 | 29 | 2,200 | 1.81 | 170.74 |
| 9/28 | 44 | 2,575 | 44 | 2,244 | 2.75 | 173.49 |
| 9/29 | 55 | 2,630 | 55 | 2,299 | 3.44 | 176.93 |
| 9/30 | 101 | 2,731 | 101 | 2,400 | 6.31 | 183.24 |
| 10/1 | 74 | 2,805 | 72 | 2,472 | 4.93 | 188.17 |
| 10/2 | 48 | 2,853 | 48 | 2,520 | 3.00 | 191.17 |
| 10/3 | 65 | 2,918 | 64 | 2,584 | 4.06 | 195.24 |
| 10/4 | 85 | 3,003 | 65 | 2,649 | 5.31 | 200.55 |
| 10/5 | 62 | 3,065 | 62 | 2,711 | 4.23 | 204.78 |
| 10/6 | 50 | 3,115 | 35 | 2,746 | 3.13 | 207.90 |
| 10/7 | 56 | 3,171 | 51 | 2,797 | 3.50 | 211.40 |
| 10/8 | 65 | 3,236 | 65 | 2,862 | 4.06 | 215.46 |
| 10/9 | 174 | 3,410 | 121 | 2,983 | 11.86 | 227.33 |
| 10/10 | 109 | 3,519 | 104 | 3,087 | 7.11 | 234.44 |
| 10/11 | 115 | 3,634 | 115 | 3,202 | 7.19 | 241.62 |
| 10/12 | 66 | 3,700 | 66 | 3,268 | 4.13 | 245.75 |
| 10/13 | 30 | 3,730 | 29 | 3,297 | 1.88 | 247.62 |
| 10/14 | 29 | 3,759 | 28 | 3,325 | 1.81 | 249.44 |
| 10/15 | 25 | 3,784 | 23 | 3,348 | 1.56 | 251.00 |
| 10/16 | 18 | 3,802 | 18 | 3,366 | 1.13 | 252.12 |
| 10/17 | 11 | 3,813 | 11 | 3,377 | 0.69 | 252.81 |
| 10/18 | 2 | 3,815 | 2 | 3,379 | 0.18 | 252.99 |
| 10/19 | 8 | 3,823 | 8 | 3,387 | 1.00 | 253.99 |
| 10/20 | 10 | 3,833 | 10 | 3,397 | 2.00 | 255.99 |
| 10/21 | 5 | 3,838 | 5 | 3,402 | 0.63 | 256.62 |

Appendix B17.–Daily catch, daily marked, and catch-per-unit-of-effort (CPUE) of chum salmon captured in the Chilkat River fish wheels June 8 to July 31, 2004.

| Date | Daily Chum Catch | Cumulative Chum Catch | Daily Chum tagged | Cumulative Chum Tagged | Daily CPUE | Cumulative Prop. CPUE |
|---|---|---|---|---|---|---|
| 6/8 | 1 | 1 | 1 | 1 | 0.06 | 0.06 |
| 6/9 | 0 | 1 | 0 | 1 | 0.00 | 0.06 |
| 6/10 | 1 | 2 | 0 | 1 | 0.06 | 0.13 |
| 6/11 | 0 | 2 | 0 | 1 | 0.00 | 0.13 |
| 6/12 | 2 | 4 | 2 | 3 | 0.13 | 0.25 |
| 6/13 | 6 | 10 | 6 | 9 | 0.38 | 0.63 |
| 6/14 | 7 | 17 | 7 | 16 | 0.44 | 1.06 |
| 6/15 | 2 | 19 | 2 | 18 | 0.13 | 1.19 |
| 6/16 | 1 | 20 | 1 | 19 | 0.06 | 1.25 |
| 6/17 | 7 | 27 | 4 | 23 | 0.44 | 1.69 |
| 6/18 | 2 | 29 | 2 | 25 | 0.13 | 1.81 |
| 6/19 | 1 | 30 | 1 | 26 | 0.06 | 1.88 |
| 6/20 | 0 | 30 | 0 | 26 | 0.00 | 1.88 |
| 6/21 | 13 | 43 | 10 | 36 | 0.81 | 2.69 |
| 6/22 | 14 | 57 | 14 | 50 | 0.88 | 3.56 |
| 6/23 | 23 | 80 | 21 | 71 | 1.44 | 5.00 |
| 6/24 | 15 | 95 | 14 | 85 | 0.94 | 5.94 |
| 6/25 | 21 | 116 | 18 | 103 | 1.31 | 7.25 |
| 6/26 | 24 | 140 | 24 | 127 | 1.50 | 8.75 |
| 6/27 | 42 | 182 | 41 | 168 | 2.63 | 11.38 |
| 6/28 | 39 | 221 | 38 | 206 | 3.04 | 14.41 |
| 6/29 | 33 | 254 | 27 | 233 | 2.06 | 16.48 |
| 6/30 | 30 | 284 | 24 | 257 | 1.88 | 18.35 |
| 7/1 | 44 | 328 | 44 | 301 | 2.84 | 21.19 |
| 7/2 | 38 | 366 | 35 | 336 | 2.38 | 23.57 |
| 7/3 | 38 | 404 | 38 | 374 | 2.38 | 25.94 |
| 7/4 | 55 | 459 | 53 | 427 | 3.44 | 29.38 |
| 7/5 | 52 | 511 | 50 | 477 | 3.25 | 32.63 |
| 7/6 | 51 | 562 | 43 | 520 | 3.19 | 35.82 |
| 7/7 | 42 | 604 | 30 | 550 | 2.63 | 38.44 |
| 7/8 | 1 | 2 | 1 | 2 | 0.06 | 0.13 |
| 7/9 | 0 | 2 | 0 | 2 | 0.00 | 0.13 |
| 7/10 | 0 | 2 | 0 | 2 | 0.00 | 0.13 |
| 7/11 | 1 | 3 | 1 | 3 | 0.06 | 0.19 |
| 7/12 | 3 | 6 | 3 | 6 | 0.19 | 0.38 |
| 7/13 | 1 | 7 | 1 | 7 | 0.06 | 0.44 |
| 7/14 | 1 | 8 | 1 | 8 | 0.06 | 0.50 |
| 7/15 | 2 | 10 | 2 | 10 | 0.13 | 0.63 |
| 7/16 | 2 | 12 | 2 | 12 | 0.13 | 0.75 |
| 7/17 | 4 | 16 | 4 | 16 | 0.25 | 1.00 |
| 7/18 | 6 | 22 | 6 | 22 | 0.38 | 1.38 |
| 7/19 | 2 | 24 | 2 | 24 | 0.13 | 1.50 |
| 7/20 | 0 | 24 | 0 | 24 | 0.00 | 1.50 |
| 7/21 | 3 | 27 | 3 | 27 | 0.19 | 1.69 |
| 7/22 | 4 | 31 | 4 | 31 | 0.25 | 1.94 |
| 7/23 | 2 | 33 | 1 | 32 | 0.13 | 2.06 |
| 7/24 | 3 | 36 | 3 | 35 | 0.19 | 2.25 |
| 7/25 | 4 | 40 | 4 | 39 | 0.25 | 2.50 |
| 7/26 | 4 | 44 | 3 | 42 | 0.25 | 2.75 |
| 7/27 | 2 | 46 | 2 | 44 | 0.13 | 2.88 |
| 7/28 | 2 | 48 | 2 | 46 | 0.13 | 3.00 |
| 7/29 | 3 | 51 | 3 | 49 | 0.20 | 3.20 |
| 7/30 | 10 | 61 | 10 | 59 | 0.63 | 3.82 |
| 7/31 | 11 | 72 | 11 | 70 | 0.69 | 4.51 |

Appendix B18.–Daily catch, daily marked, and catch-per-unit-of-effort (CPUE) of chum salmon captured in the Chilkat River fish wheels August 1 to September 30, 2004.

| Date | Daily Chum Catch | Cumulative Chum Catch | Daily Chum tagged | Cumulative Chum Tagged | Daily CPUE | Cumulative Prop. CPUE |
|---|---|---|---|---|---|---|
| 8/1 | 6 | 78 | 6 | 76 | 0.38 | 4.88 |
| 8/2 | 18 | 96 | 18 | 94 | 1.13 | 6.01 |
| 8/3 | 19 | 115 | 19 | 113 | 1.19 | 7.20 |
| 8/4 | 12 | 127 | 12 | 125 | 0.75 | 7.95 |
| 8/5 | 23 | 150 | 20 | 145 | 1.44 | 9.38 |
| 8/6 | 8 | 158 | 8 | 153 | 0.64 | 10.02 |
| 8/7 | 8 | 166 | 8 | 161 | 0.50 | 10.52 |
| 8/8 | 20 | 186 | 20 | 181 | 2.50 | 13.02 |
| 8/9 | 16 | 202 | 16 | 197 | 2.00 | 15.02 |
| 8/10 | 32 | 234 | 31 | 228 | 4.00 | 19.02 |
| 8/11 | 25 | 259 | 24 | 252 | 2.31 | 21.33 |
| 8/12 | 9 | 268 | 9 | 261 | 0.56 | 21.89 |
| 8/13 | 33 | 301 | 32 | 293 | 2.06 | 23.96 |
| 8/14 | 29 | 330 | 29 | 322 | 1.81 | 25.77 |
| 8/15 | 52 | 382 | 52 | 374 | 3.25 | 29.02 |
| 8/16 | 38 | 420 | 38 | 412 | 2.38 | 31.39 |
| 8/17 | 44 | 464 | 42 | 454 | 2.75 | 34.14 |
| 8/18 | 53 | 517 | 53 | 507 | 3.31 | 37.46 |
| 8/19 | 54 | 571 | 54 | 561 | 3.38 | 40.83 |
| 8/20 | 68 | 639 | 66 | 627 | 4.25 | 45.08 |
| 8/21 | 64 | 703 | 64 | 691 | 4.00 | 49.08 |
| 8/22 | 42 | 745 | 42 | 733 | 2.63 | 51.71 |
| 8/23 | 61 | 806 | 59 | 792 | 4.41 | 56.12 |
| 8/24 | 130 | 936 | 130 | 922 | 8.13 | 64.24 |
| 8/25 | 107 | 1,043 | 104 | 1,026 | 7.13 | 71.37 |
| 8/26 | 67 | 1,110 | 67 | 1,093 | 5.15 | 76.53 |
| 8/27 | 122 | 1,232 | 122 | 1,215 | 7.63 | 84.15 |
| 8/28 | 119 | 1,351 | 119 | 1,334 | 7.44 | 91.59 |
| 8/29 | 141 | 1,492 | 141 | 1,475 | 8.81 | 100.40 |
| 8/30 | 89 | 1,581 | 89 | 1,564 | 5.56 | 105.97 |
| 8/31 | 114 | 1,695 | 114 | 1,678 | 7.13 | 113.09 |
| 9/1 | 111 | 1,806 | 111 | 1,789 | 6.94 | 120.03 |
| 9/2 | 179 | 1,985 | 179 | 1,968 | 11.19 | 131.22 |
| 9/3 | 134 | 2,119 | 130 | 2,098 | 8.38 | 139.59 |
| 9/4 | 87 | 2,206 | 87 | 2,185 | 5.44 | 145.03 |
| 9/5 | 126 | 2,332 | 126 | 2,311 | 7.88 | 152.90 |
| 9/6 | 57 | 2,389 | 57 | 2,368 | 3.56 | 156.47 |
| 9/7 | 37 | 2,426 | 37 | 2,405 | 2.31 | 158.78 |
| 9/8 | 80 | 2,506 | 79 | 2,484 | 5.00 | 163.78 |
| 9/9 | 33 | 2,539 | 33 | 2,517 | 2.06 | 165.84 |
| 9/10 | 55 | 2,594 | 55 | 2,572 | 3.44 | 169.28 |
| 9/11 | 30 | 2,624 | 30 | 2,602 | 1.88 | 171.15 |
| 9/12 | 28 | 2,652 | 28 | 2,630 | 1.75 | 172.90 |
| 9/13 | 31 | 2,683 | 31 | 2,661 | 1.94 | 174.84 |
| 9/14 | 38 | 2,721 | 38 | 2,699 | 2.38 | 177.22 |
| 9/15 | 35 | 2,756 | 35 | 2,734 | 2.19 | 179.40 |
| 9/16 | 25 | 2,781 | 25 | 2,759 | 1.56 | 180.97 |
| 9/17 | 50 | 2,831 | 50 | 2,809 | 3.13 | 184.09 |
| 9/18 | 56 | 2,887 | 56 | 2,865 | 3.50 | 187.59 |
| 9/19 | 50 | 2,937 | 50 | 2,915 | 3.13 | 190.72 |
| 9/20 | 80 | 3,017 | 80 | 2,995 | 5.00 | 195.72 |
| 9/21 | 106 | 3,123 | 106 | 3,101 | 7.23 | 202.94 |
| 9/22 | 13 | 3,136 | 13 | 3,114 | 1.11 | 204.06 |
| 9/23 | 12 | 3,148 | 10 | 3,124 | 0.75 | 204.81 |
| 9/24 | 3 | 3,151 | 3 | 3,127 | 0.19 | 204.99 |
| 9/25 | 23 | 3,174 | 23 | 3,150 | 1.92 | 206.91 |
| 9/26 | 60 | 3,234 | 60 | 3,210 | 3.75 | 210.66 |
| 9/27 | 56 | 3,290 | 55 | 3,265 | 3.50 | 214.16 |
| 9/28 | 14 | 3,304 | 14 | 3,279 | 0.88 | 215.04 |
| 9/29 | 68 | 3,372 | 68 | 3,347 | 4.25 | 219.29 |
| 9/30 | 193 | 3,565 | 193 | 3,540 | 12.06 | 231.35 |

Appendix B19.–Daily catch, daily marked, and catch-per-unit-of-effort (CPUE) of chum salmon captured in the Chilkat River fish wheels October 1 to October 19 (end of season), 2004.

| Date | Daily Chum Catch | Cumulative Chum Catch | Daily Chum tagged | Cumulative Chum Tagged | Daily CPUE | Cumulative Prop. CPUE |
|---|---|---|---|---|---|---|
| 10/1 | 136 | 3,701 | 136 | 3,676 | 8.50 | 239.85 |
| 10/2 | 37 | 3,738 | 36 | 3,712 | 2.31 | 242.16 |
| 10/3 | 17 | 3,755 | 17 | 3,729 | 1.06 | 243.22 |
| 10/4 | 36 | 3,791 | 36 | 3,765 | 2.25 | 245.47 |
| 10/5 | 26 | 3,817 | 26 | 3,791 | 1.63 | 247.10 |
| 10/6 | 14 | 3,831 | 14 | 3,805 | 0.98 | 248.08 |
| 10/7 | 50 | 3,881 | 50 | 3,855 | 3.13 | 251.20 |
| 10/8 | 81 | 3,962 | 80 | 3,935 | 5.06 | 256.26 |
| 10/9 | 102 | 4,064 | 102 | 4,037 | 6.38 | 262.64 |
| 10/10 | 65 | 4,129 | 65 | 4,102 | 4.06 | 266.70 |
| 10/11 | 64 | 4,193 | 64 | 4,166 | 4.00 | 270.70 |
| 10/12 | 33 | 4,226 | 33 | 4,199 | 2.06 | 272.76 |
| 10/13 | 17 | 4,243 | 17 | 4,216 | 1.06 | 273.83 |
| 10/14 | 4 | 4,247 | 4 | 4,220 | 0.25 | 274.08 |
| 10/15 | 4 | 4,251 | 4 | 4,224 | 0.25 | 274.33 |
| 10/16 | 14 | 4,265 | 14 | 4,238 | 0.88 | 275.20 |
| 10/17 | 0 | 4,265 | 0 | 4,238 | 0.00 | 275.20 |
| 10/18 | 3 | 4,268 | 3 | 4,241 | 0.19 | 275.39 |
| 10/19 | 7 | 4,275 | 7 | 4,248 | 0.88 | 276.26 |