**Fishery Data Series No. 01-32**

# Escapements of Chinook Salmon in Southeast Alaska and Transboundary Rivers in 2000

**by**

**Keith A. Pahlke**

**December 2001**

**Alaska Department of Fish and Game** **Division of Sport Fish**

## Symbols and Abbreviations

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**Weights and measures (metric)**

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

**Weights and measures (English)**

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

Spell out acre and ton.

**Time and temperature**

| | |
|---|---|
| day | d |
| degrees Celsius | °C |
| degrees Fahrenheit | °F |
| hour (spell out for 24-hour clock) | h |
| minute | min |
| second | s |

Spell out year, month, and week.

**Physics and chemistry**

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

**General**

| | |
|---|---|
| All commonly accepted abbreviations. | e.g., Mr., Mrs., a.m., p.m., etc. |
| All commonly accepted professional titles. | e.g., Dr., Ph.D., R.N., etc. |
| and | & |
| at | @ |
| Compass directions: | |
| east | E |
| north | N |
| south | S |
| west | W |
| Copyright | © |
| Corporate suffixes: | |
| Company | Co. |
| Corporation | Corp. |
| Incorporated | Inc. |
| Limited | Ltd. |
| et alii (and other people) | et al. |
| et cetera (and so forth) | etc. |
| exempli gratia (for example) | e.g., |
| 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 |
| number (before a number) | # (e.g., #10) |
| pounds (after a number) | # (e.g., 10#) |
| registered trademark | ® |
| Trademark | ™ |
| United States (adjective) | U.S. |
| United States of America (noun) | USA |
| U.S. state and District of Columbia abbreviations | use two-letter abbreviations (e.g., AK, DC) |

**Mathematics, statistics, fisheries**

| | |
|---|---|
| alternat e 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 | C.I. |
| correlation coefficient | R (multiple) |
| correlation coefficient | r (simple) |
| covariance | cov |
| degree (angular or temperature) | ° |
| degrees of freedom | df |
| divided by | ÷ or / (in equations) |
| equals | = |
| expected value | E |
| fork length | FL |
| 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. |
| mideye-to-tail fork | MEF |
| minute (angular) | ' |
| multiplied by | x |
| 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 |
| standard length | SL |
| total length | TL |
| variance | var |

*FISHERY DATA SERIES NO. 01-32*

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by

Keith A. Pahlke
*Division of Sport Fish, Douglas*

Alaska Department of Fish and Game
Division of Sport Fish
P. O. Box 240020
Douglas, AK 99824-0020

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*Keith A. Pahlke* [a]
*Alaska Department of Fish and Game, Division of Sport Fish*
*P. O. Box 240020, Douglas, AK 99824-0020, USA*
*email:* keith_pahlke@fishgame.state.ak.us
[a] *Author to whom all correspondence should be addressed.*

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# ABSTRACT

As part of a continuing stock assessment program in Southeast Alaska, the Division of Sport Fish obtained indices of escapement for chinook salmon *Oncorhynchus tshawytscha* in designated streams and transboundary rivers. The estimated total escapement in 2000 was 94,428 large (age .3 and older) chinook, a 31% increase from the escapement of 72,010 fish estimated in 1999. The 2000 estimate was 155% of the 1977–1979 average of 64,296 chinook salmon, 98% of the 1980–1989 average of 96,089 and 77% of the 1990–1999 average of 122,918 fish.

Seven out of eleven escapement indices increased from 1999, however indices were below escapement goal ranges in the Chilkat and Blossom rivers. Estimated age and sex composition and mean length at age of all stocks sampled in 2000 are presented.



Key words: chinook, *Oncorhynchus tshawytscha*, escapement, escapement goals, Taku River, Stikine River, Alsek River, Chilkat River, Unuk River, Chickamin River, Blossom River, Keta River, King Salmon River, Situk River, Andrew Creek, U.S./Canada Treaty, transboundary rivers


# INTRODUCTION

Chinook salmon *Oncorhynchus tshawytscha* are known to occur in 34 rivers in, or draining into, the Southeast region of Alaska from British Columbia or Yukon Territory, Canada, (Kissner 1977). In the mid-1970s it became apparent that many of the chinook salmon stocks in this region were depressed relative to historical levels of production (Kissner 1974), and a fisheries management program was implemented to rebuild stocks in Southeast Alaska streams and in transboundary rivers (rivers that originate in Canada and flow into Southeast Alaska coastal waters; ADF&G 1981). Initially, this management program closed commercial and recreational fisheries in terminal and near-terminal areas in U.S. waters.

In 1981, this program was formalized and expanded to a 15-year (roughly 3 life-cycles) rebuilding program for the transboundary Taku, Stikine, Alsek, Unuk, Chickamin, and Chilkat rivers and the non-transboundary Blossom, Keta, Situk, and King Salmon rivers (ADF&G 1981) (Figure 1). The program used region-wide, all-gear catch ceilings for chinook salmon, designed to rebuild spawning escapements by 1995 (ADF&G 1981). In 1985, the Alaskan program was incorporated into a comprehensive coast-wide rebuilding program for all wild stocks of chinook salmon, under the auspices of the U.S./Canada Pacific Salmon Treaty (PST).

To track the spawning escapement, the Alaska Department of Fish and Game (ADF&G), the Canadian Department of Fisheries and Oceans (DFO), the Taku River Tlingit First Nation (TRTFN), and the Tahltan First Nation (TFN) count spawning chinook salmon in a designated set of eleven watersheds (Appendix A1). These streams were selected on the basis of their historical importance to fisheries, size of the population, geographic distribution, extent of the historical database, and ease of data collection. Counts from each of these streams are considered to be indicators of relative abundance, based on the assumption that counts are a relatively constant proportion of the annual escapement in an index area or watershed.

Programs to estimate total escapement and survey count-to-escapement expansion factors for index counts have been implemented for all 11 index stocks. Long-term annual programs are in place on the Situk, Alsek, Chilkat, Taku, Stikine and Unuk rivers. Short-term (2–3 year) projects were used to estimate expansion factors for the other 5 systems. Estimates of escapement from these mark-recapture and weir studies are generally superior to expanded survey count estimates, and are preferentially employed whenever they are available.

Escapement data are provided annually to the Joint Chinook Technical Committee (CTC) of the Pacific Salmon Commission (PSC), who use them to evaluate the status of the indicator stocks (PSC 1997). Estimates of the total escapement of

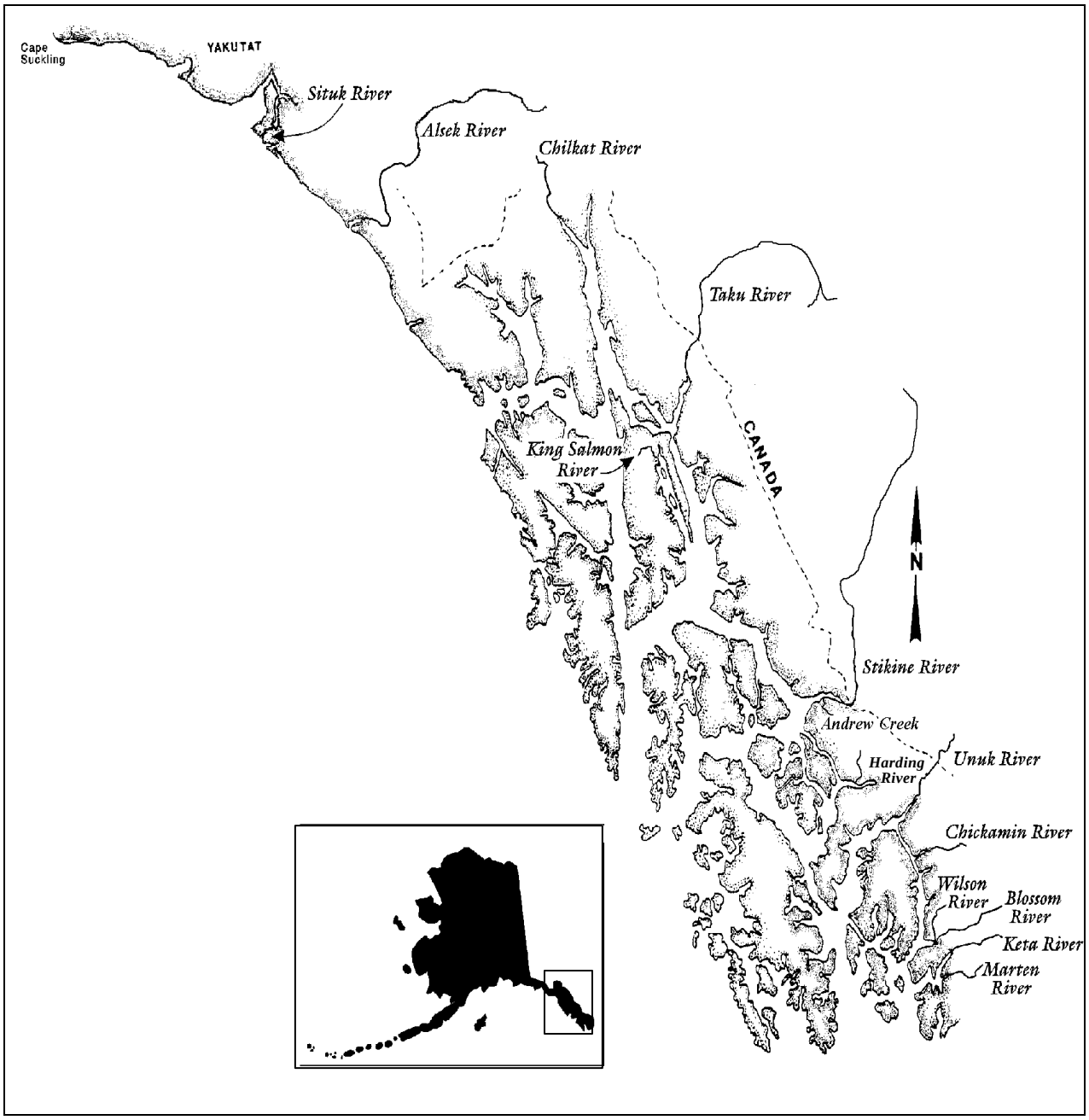


**Figure 1.–Location of selected chinook salmon systems in Southeast Alaska, Yakutat, and transboundary rivers.**

large spawners are provided to the CTC for six stocks (Situk, Chilkat, Taku, Stikine, Andrew and King Salmon rivers) and index counts for the remaining five stocks are used to track trends in escapement.

In addition to these applications, Biological Escapement Goals (BEGs 5AAC 39.222) have been established for 10 of the systems and fisheries are managed to achieve those escapement goal ranges.

This project obtained indices of spawner abundance for major chinook salmon stocks in Southeast Alaska. Objectives for 2000 were to count large (≥660 mm mid-eye to fork length,

or ocean-age 3 and older) spawning chinook salmon during the time of peak abundance in tributaries and mainstem areas of the Stikine, Taku, Alsek, Situk, Unuk, Chickamin, Keta, Blossom, King Salmon rivers and in Andrew Creek, and to compile and compare the indices to those from past years.

## DESCRIPTION OF STUDY SITES

Many individual spawning areas are surveyed annually in a designated set of watersheds. Detailed descriptions and maps of these areas are found in Mecum and Kissner (1989), and general descriptions of the watersheds are below.

*The Taku River* originates in northern British Columbia and flows into the ocean 48 km east of Juneau, Alaska. The Taku River drainage covers over 17,000 km$^2$; average monthly flows range from 60 m$^3$/sec in February to 1,097 m$^3$/sec in June (Bigelow et al. 1995). Principal tributaries are the Sloko, Nakina, Sheslay, Inklin, and Nahlin rivers. The clearwater Nakina and Nahlin rivers contribute less than 25% of the total drainage discharge; most is from glacier-fed streams on the eastern slope of the Coast Range of British Columbia. Upstream of the abandoned mining community of Tulsequah, British Columbia, the drainage remains in pristine condition, with very few mining, logging, or other development activities. The upper Taku River area is extremely remote, with no road access and few year-round residents. All of the important chinook salmon spawning areas are in tributaries in the upper drainage in British Columbia.

Stock assessment of chinook salmon has been conducted intermittently on the Taku River since the 1950s, and standardized helicopter surveys of the index areas have been conducted annually since 1973. Survey index areas include portions of the Nakina, Nahlin, Dudidontu, Tatsamenie, and Kowatua rivers and Tseta Creek. In addition, since 1973 the DFO, TRTFN, and ADF&G have operated a carcass collection weir below the major spawning area on the Nakina river, which provides an estimate of the age and size composition of the escapement. Mark-recapture experiments are providing annual independent estimates of total escapement since 1995 (McPherson et al. 1996, 1997, 1998a, 1999).

*The Stikine River* originates in British Columbia and flows to the sea approximately 32 km south of Petersburg, Alaska. Its drainage covers about 52,000 km$^2$, much of which is inaccessible to anadromous fish because of natural barriers and velocity blocks. The Stikine River's principal tributaries include the Tahltan, Chutine, Scud, Iskut, and Tuya rivers. The lower river and most tributaries are glacially occluded (e.g., Chutine, Scud, and Iskut rivers).

Only 2% of the Stikine River drainage is in Alaska (Beak Consultants Limited 1981), and the majority of the chinook salmon spawning areas in the Stikine River are located in British Columbia, Canada, in the mainstem Tahltan and Little Tahltan rivers (including Beatty Creek). However, Andrew Creek, in the U.S. portion of the lower Stikine River, supports a significant run of chinook salmon. The upper drainage of the Stikine is accessible via the Telegraph Creek Road.

Helicopter surveys of the Little Tahltan River index area have been conducted annually since 1975, and the DFO and TFN have operated a fish counting weir at the mouth of the Little Tahltan River since 1985. Counts from the weir represent the total escapement to that tributary. Since 1996, mark-recapture experiments have provided independent estimates of total escapement to the Stikine River (Pahlke and Etherton 1997; 1999a; 2000).

*Andrew Creek* flows into the lower Stikine River in Alaska, not far from the limit of tidal influence. From 1976 to 1984, a weir was operated on Andrew Creek to provide brood stock for hatcheries. Foot, aerial and helicopter surveys to count chinook salmon have been conducted annually since 1985. A new weir was operated on Andrew Creek in 1997 and 1998.

*The Alsek River* originates in Yukon Territory, Canada, and flows in a southerly direction into the Gulf of Alaska approximately 75 km southeast of Yakutat, Alaska. Its largest tributaries are the Dezadeash and Tatshenshini rivers. The Alsek River drainage covers about 28,000 km$^2$

(Bigelow et al. 1995), but much of it, including the mainstem of the Alsek itself, is inaccessible to anadromous salmonids because of velocity barriers. The significant spawning areas for chinook salmon are found mostly in tributaries of the Tatshenshini River, including the Klukshu, Blanchard, and Takhanne rivers and in Village and Goat creeks. The Klukshu and upper Tatshenshini rivers are accessible by road near Dalton Post, Yukon Territory.

Counts of chinook salmon have been collected on the Alsek River since 1962. Beginning in 1976, the DFO has operated a weir at the mouth of the Klukshu to count chinook, sockeye *O. nerka*, and coho salmon O. *kisutch*. The count of chinook salmon through the Klukshu River weir is used as the index for the Alsek River. Some aboriginal harvest takes place above the weir. Aerial surveys to count spawning chinook salmon have been conducted by ADF&G with a helicopter since 1981. Prior to 1981, surveys were made from fixed-wing aircraft. The escapement to the Klukshu River is difficult to count by aerial, boat or foot surveys because of deep pools and overhanging vegetation. However, surveys of the Klukshu River are conducted annually to provide some continuity in estimates in the event that funding for the weir is discontinued. The Blanchard and Takhanne Rivers and Goat Creek, three smaller tributaries of the Tatshenshini River, are also surveyed annually, but are not used to index escapements. In 1998, a mark-recapture and radio telemetry study was conducted to estimate the escapement and distribution of spawning chinook salmon in the Alsek River (Pahlke et al. 1999) and the mark-recapture experiment was continued in 1999 and 2000 (Pahlke and Etherton 2001a; 2001b).

The Unuk, Chickamin, Blossom, and Keta river drainages all feed into Behm Canal—a narrow passage of water east of Ketchikan, Alaska. Misty Fiords National Monument/ Wilderness Area surrounds the eastern or "back" Behm Canal and includes the Boca de Quadra fjords. Many of the mainland rivers in the area support chinook salmon; the Unuk, Chickamin, Blossom and Keta rivers are designated chinook salmon escapement index systems.

*The Unuk River* originates in a glaciated area of British Columbia and flows 129 km to Burroughs Bay, 85 km northeast of Ketchikan, Alaska; only the lower 39 km of the river are in Alaska. The Unuk is a large braided, glacially occluded river with a drainage of approximately 3,885 km$^2$. Most (~85%) spawning occurs in tributaries of the Alaska portion of the river (Pahlke et al. 1996). The escapement index areas are all small clear-water tributaries: Eulachon River and Cripple, Genes Lake, Clear, Lake, and Kerr creeks. Cripple Creek and Genes Lake Creek cannot be surveyed by air because of heavy vegetation, so fish are counted by foot survey. Chinook salmon have been counted annually by foot or helicopter surveys in these areas since 1977. Chinook salmon have been periodically counted in Boundary Creek, but survey conditions there are often poor and the counts are not included in the index. Total escapement was estimated by a mark-recapture project in 1994 (Pahlke et al. 1996) and annually since 1997 (Jones et al. 1998; Jones and McPherson 1999, 2000, 2002).

*The Chickamin River* is a large, glacial river that originates in British Columbia, and flows into Behm Canal approximately 32 km southeast of Burroughs Bay and 65 km northeast of Ketchikan. Although it is technically a transboundary river, there are no chinook spawning areas on the Chickamin River upstream from the Canadian border (Pahlke 1997a). Important spawning tributaries are the South Fork of the Chickamin and Barrier, Butler, Indian, Leduc, Humpy, King, and Clear Falls creeks. Chinook salmon have been counted by foot or helicopter surveys in index areas of the Chickamin River each year since 1975. Total escapement was estimated by mark-recapture projects in 1995 and 1996, and spawning distribution was estimated by radio-telemetry in 1996 (Pahlke 1996; Pahlke 1997a).

*The Blossom, Keta, Wilson, and Marten rivers* are non-transboundary rivers that flow into Behm Canal approximately 45 km east of Ketchikan. These rivers lie inside the boundaries of the Misty Fiords National Monument in southern Behm Canal but are within an area that has been specifically excluded from Wilderness designation, because of the potential development of a

large-scale molybdenum mine (Quartz Hill) near the divide of the Blossom and Keta rivers. The mine is presently undeveloped, but an access road has been completed; it terminates at salt water near the mouth of the Blossom River.

The Keta River drainage covers about 192 km$^2$ and the Blossom about 176 km$^2$ (Bigelow et al. 1995) and have been surveyed by helicopter annually since 1975. Chinook salmon escapements to the Wilson and Marten rivers have been monitored on an intermittent basis in recent years. Mark-recapture experiments were conducted in 1998 to estimate the escapement of chinook salmon in the Blossom and Keta rivers (Brownlee et al. 1999) and were repeated on the Keta River in 1999 and 2000 (Freeman et al. 2001).

*The King Salmon River* drains an area of approximately 100 km$^2$ on Admiralty Island, flowing into King Salmon Bay on the eastern side of Stephens Passage about 48 km south of Juneau. The King Salmon River is the only island river system in Southeast Alaska to support more than 100 spawning chinook salmon. ADF&G operated a weir on the King Salmon River from 1983 through 1992 to count chinook salmon and collect broodstock for Snettisham Hatchery. Helicopter surveys have been conducted annually since 1975 and foot surveys since 1992.

*The Chilkat River* is a large glacial river which originates in Yukon Territory, Canada, and flows into Chilkat Inlet at the head of northern Lynn Canal near Haines, Alaska. Helicopter and foot surveys are an ineffective index of abundance for this system (Johnson et al. 1992) and were suspended in 1993, in favor of annual estimates of escapement using mark-recapture methods. Total escapement has been estimated annually since 1991 (Ericksen 2000).

*The Situk River* is located about 16 km east of Yakutat, Alaska. The Situk supports a large run of sockeye salmon which are harvested in commercial and subsistence set gillnet fisheries concentrated at the mouth of the Situk River. Situk River chinook salmon are harvested both incidentally and targeted in the set gillnet fisheries, depending on run strength, and in a recreational fishery in the river. A weir was operated on the Situk River at the upper limit of the intertidal area from 1928 to 1955 to count all five species of Pacific salmon spawning in the river. Since 1976, a weir has been operated primarily to count chinook and sockeye salmon. The proportion of the recreational harvest above the weir varies from year to year (Howe et al. 1998).

# METHODS

There are 34 river systems in the region (Figure 1) with populations of wild chinook salmon. Three transboundary rivers, the Taku, Stikine, and Alsek, are classed as major producers—each with potential production (harvest plus escapement) greater than 10,000 fish (Kissner 1974). Nine rivers are classed as medium producers, each with production of 1,500 to 10,000 fish. The remaining 22 rivers are minor producers, with production less than 1,500 fish. Small numbers of chinook salmon occur in other streams of the region but they are not included in the above list because successful spawning has not been documented. Chinook salmon are counted via aerial surveys or at weirs each year in all three major producing systems, in six of the medium producers, and in one minor producer (Appendix A2). Abundance in the Chilkat River is estimated only by a mark-recapture program. These index systems, along with the Chilkat River, are believed to account for about 90% of the total chinook salmon escapement in Southeast Alaska and transboundary rivers.

## ESCAPEMENT GOALS

The initial rebuilding program established interim escapement goals in 1981 for nine systems: the Alsek, Taku, Stikine, Situk, King Salmon, Unuk, Chickamin, Keta and Blossom/Wilson Rivers. Although the aim was to have escapement goals that provided the optimal level of harvest, little data was available to produce such goals. As a result, escapement goals were originally set based on the highest observed escapement count prior to 1981 (Pahlke 1997b). Goals for the Chilkat River and Andrew Creek were added in 1985, bringing the total number of regularly monitored river systems to eleven. Pahlke (1997b) provides detailed descriptions of the escapement goals and

their origins. Escapement goals have been revised when sufficient new information warrants. Most of the revised escapement goals have been developed with spawner-recruit analysis, as ranges of optimum escapement rather than a single point estimate (Appendix A1). Spawner-recruit analysis requires not only a long series of escapement estimates, but also annual age and sex-specific estimates of escapement (McPherson and Carlile 1997). The United States Section of the CTC developed data standards in 1997 for stock specific assessments of escapement, terminal runs, and forecasts of abundance which are used to evaluate existing stock assessment programs (USCTC 1997). This data has been collected routinely at weirs and during mark-recapture studies and recently specific programs have been implemented to collect age, sex and length data from chinook salmon in the Blossom, Chickamin, and King Salmon rivers and Andrew Creek.

## INDICES OF ESCAPEMENT

Spawning chinook salmon are counted at 26 designated index areas in nine of the systems; total escapement in the other two systems are estimated by complete counts of chinook salmon at the Situk River weir and by annual mark-recapture estimates on the Chilkat River. Counts are made during aerial or foot surveys during periods of peak spawning, or at weirs. Peak spawning times, defined as the period when the largest number of adult chinook salmon actively spawn in a particular stream or river, are well-documented from surveys of these index areas conducted since 1976 (Kissner 1982; Pahlke 1997b). The proportion of fish in pre-spawning, spawning and post-spawning condition is used to judge whether the survey timing is correct to encompass peak spawning. Index areas are surveyed at least twice unless turbid water or unsafe conditions preclude the second survey. Survey conditions on each index survey are rated as poor, normal or excellent for that particular index area. Factors that affect the rating include water level, clarity, light conditions, and weather.

Only large (typically age-.3, -.4, and -.5) chinook salmon, $\geq$660 mm mideye-to-fork length (MEF), are counted during aerial or foot surveys. No attempt is made to accurately count small (typically age-.1 and -.2) chinook salmon <660 mm (MEF) (Mecum 1990). These small chinook salmon, also called jacks, are early maturing, precocious males considered to be surplus to spawning escapement needs. They are easy to separate visually from their older age counterparts under most conditions, because of their short, compact bodies and lighter color. They are, however, difficult to distinguish from other smaller species such as pink *O. gorbuscha* and sockeye salmon. In some systems age-1.2 fish may be larger than 660 mm MEF and be difficult to avoid counting.

Aerial surveys are conducted from a Bell 206 or Hughes 500D helicopter. Pilots are directed to fly the helicopter from 6 to 15 meters above the river bed at a speed of 6-16 km/h. The helicopter door on the side of the observer is removed, and the helicopter is flown sideways while observations of spawning chinook salmon are made from the open space. Foot surveys are conducted by at least two people walking in the creek bed or on the riverbank.

Weather, distances involved, run timing, etc., can make it difficult for a single surveyor to complete all the index surveys annually under normal or excellent conditions. Thus, alternate surveyors are selected to conduct the counts when the primary surveyor is unavailable. Also, new surveyors take on primary responsibilities at infrequent intervals. Since between observer variability and bias can be significant (Jones et al. 1998), new surveyors must be trained and calibrated against the primary surveyor to provide consistency and continuity in the data. Alternate observers accompany the primary observer on regularly scheduled surveys to learn survey methods and counting techniques (training flights). Each alternate observer also accompanies the primary observer on additional regularly scheduled surveys to independently count chinook salmon (calibration flights). Each calibration flight consists of two passes over the index area so the two observers in turn sit in the preferred location in the helicopter during one pass along the river. Counts are not shared during the calibration surveys, but are shared and discussed following the completion of the second pass of each flight. Calibration data will be

collected annually for several years. The relationship between observer escapement counts will be determined from the accumulated data, and applied to counts as needed.

Several index areas are routinely surveyed by more than one method; e.g. Andrew Creek is surveyed from airplanes, helicopters and by foot. The various surveys will be conducted as close as possible to each other to promote comparison and calibration of the different methods.

Counts and other observations from the 2000 surveys (Appendix A3) are entered into the ADF&G CFMD Integrated Fisheries Database (IFDB) in Juneau for archiving and general distribution.

Estimates of total escapement are needed to model total production, exploitation rates and other population parameters. To estimate escapement (since indices are only a partial count of spawning abundance), counts from index areas are increased by an expansion factor (Table 1). An expansion factor is an estimate of the proportion of the season's total escapement counted in a river system during the peak spawning period. Expansion factors are based on comparisons with weir counts, mark-recapture estimates, and spawning distribution studies. They vary among rivers according to how complete the coverage of spawning areas is and difficulties encountered in observing spawners, such as overhanging vegetation, turbid water conditions, presence of other salmon species (i.e., pink and chum *O. keta* salmon), or protraction of run timing. Expansion factors range from 1.5 for the King Salmon River to 5.2 for the Taku River (Table 1).

Escapement counts are obtained from a fish-counting weir on the Situk River and a mark-recapture program on the Chilkat River. Survey expansions are not necessary for those streams where weirs or other estimation programs are used to count all migrating chinook salmon.

Finally, to estimate total regional escapement, escapement estimates from the 11 index systems are expanded to account for the unsurveyed systems. (Appendix A2). Presently, we believe the total estimated escapement in the index areas represents approximately 90% of the region total. Escapement estimates for the Chilkat River are not available prior to 1991. From 1991 to 1997 the estimated escapement to the Chilkat River averaged 6% of the estimated regionwide total. Therefore, prior to 1991 the expanded index counts represent approximately 84% of the estimated Southeast Alaska total escapement.

Expansion factors for individual rivers have been revised, based on results from experiments to estimate total escapement and spawning distribution. For example, estimated total escapement and radio-tracking distribution data were used to revise tributary expansion factors for the Taku and Unuk rivers (Pahlke and Bernard 1996; McPherson et al. 1996 and McPherson et al. 1997). Mark-recapture studies to estimate spawning abundance on the Unuk River in 1994 (Pahlke et al. 1996) and on the Chickamin River in 1995 and 1996 (Pahlke 1996, Pahlke 1997a) were used to revise expansion factors for those two rivers in 1996; results were also applied to the nearby Blossom and Keta rivers. On Andrew Creek, a weir was operated over four years (1979, 1981, 1982, and 1984), during which index counts were also made, establishing a new expansion factor for that system in 1995. Also in 1997, ten years (1983–1992) of matched weir and index counts were used to revise the expansion factor for the King Salmon River (McPherson and Clark 2001). The expansion factors for the Taku River were revised in 1996 and again in 1999 based on the results of mark-recapture studies (Pahlke and Bernard 1996, McPherson et al. 2000).

These studies have helped to estimate total escapement in the region and have shown that, in most cases, the surveyed index areas provide reasonably accurate trends in escapements. However, Johnson et al. (1992) demonstrated that expansion factors used before 1991 on the Chilkat River system were highly inaccurate, because the index areas received less than 5% of the escapement. Consequently, since 1991, escapement to the Chilkat River has been estimated annually by mark-recapture experiments (Ericksen 1997). Studies on the Taku, Stikine, Alsek, Unuk, Chickamin, Blossom, Keta and King Salmon rivers, as well as on Andrew Creek, have shown that the index expansion factors used on those systems were much more accurate than those used on the Chilkat (PSC 1991, Pahlke 1996, Pahlke

**Table 1.–Peak survey counts, survey expansion factors, estimated total escapement from expanded survey counts, M-R projects or weir, for chinook salmon returning to Southeast Alaska and transboundary rivers in 2000.**

| | Survey area | Survey count | Survey expansion factor | Survey expansion estimated escapement [a] | Estimated total escapement (M-R or weir) [b] | Reference [c] |
|---|---|---|---|---|---|---|
| **Major producers** | | | | | | |
| Alsek River | Klukshu | 1,365 | 4.0 | 5,440 [d] | 8,295 | Pahlke and Etherton 2001 |
| Taku River | 5 tributaries | 5,772 | 5.2 | 30,014 | 30,529 | McPherson et al. 2002 |
| Stikine River | Little Tahltan | 6,640 | 5.15 | 34,196 | 27,531 | Derhovanisian et al. 2001 |
| Category subtotal | | | | 69,650 | | |
| **Medium producers** | | | | | | |
| Situk River | NA | NA | NA | NA | 1.888 [e] | |
| Chilkat River | NA | NA | NA | NA | 2,035 f | Ericksen 2001 |
| Andrew Cr. | All | 690 | 2.0 | 1,380 | NA | |
| Unuk River | 6 tributaries | 1,341 | 4.0 | 5,364 | 5,872 | Jones and McPherson 2002 |
| Chickamin River | 8 tributaries | 801 | 4.0 | 3,204 | NA | |
| Blossom River | All | 231 | 2.5 | 578 | NA | |
| Keta River | All | 300 | 2.5 | 750 | 914 | Freeman et al. 2001 |
| Category subtotal | | | | 15,199 | | |
| **Minor producers** | | | | | | |
| King Salmon R. | All | 91 | 1.5 | 137 | NA | |
| **Index system total** | | | | 84,985 | | |
| **Region total** | | | [g] | 94,428 | | |

[a] Estimated by multiplying survey count by expansion factor.

[b] Estimated from mark-recapture program or weir count. Final numbers used for ADF&G management.

[c] Reference document for mark-recapture estimate.

[d] Klukshu weir count × 4 minus aboriginal fishery harvest above weir (20).

[e] Situk River weir count broke down by age and size composition, minus estimated sport harvest of large fish above weir (825).

[f] Mark-recapture estimates used instead of expansion factors.

[g] Regional expansion factor (90%) developed in 1998.

1997a). Expansion factors will continue to be revised as additional data become available. Ongoing research projects should provide more information on the expansion factors for the Taku, Stikine, Unuk, Keta, and Alsek rivers. Estimates of escapement from expanded counts are included in this document to provide relative estimates of total spawner abundance over time, with the caveat that expansion factors may produce incorrect estimates, or be revised in the future.

## AGE, SEX, AND LENGTH COMPOSITION OF ESCAPEMENTS

I compiled estimates of escapement by age and sex for all 11 systems having chinook salmon stock assessment projects in Southeast Alaska in 2000 (Appendix A4) to provide a basic statistical summary for managers and researchers. Estimates for the Keta, Unuk, Stikine, Taku, Chilkat and Alsek rivers were the results of research projects using mark-recapture experiments (Freeman et al. 2001; Jones and McPherson 2002; DerHovanisian et al 2001; McPherson et al. 2002; Ericksen 2001; Pahlke and Etherton 2001b. Results compiled from each of these projects are the reported unbiased estimates of escapement of medium and large sized chinook salmon, except for the Stikine River where the unbiased estimates include small fish. Estimates for medium and large fish from the Situk River are based on age sampling and a total census of the escapement at a weir.

Age composition estimates for the Chickamin, Blossom and King Salmon rivers and Andrew Creek were calculated by dividing the peak survey count by the best available survey-count-to-escapement expansion factor (Table 1), and multiplying the result by the age composition of the escapement sampled on the spawning grounds of each drainage in 2001. Standard errors have not been estimated for these numbers because of the short series of data upon which the expansion factors are based. Note that the survey index count for these 4 systems is assumed to include many age 1.2 chinook salmon because their large size makes them virtually indistinguishable from the large sized fish targeted for counting. For this reason, all fish sampled on the spawning grounds (most are age 1.2 and older) are used in the calculations reported in Appendix A4. Also note that while there was no way to investigate size or sex selective sampling in these spawning ground samples, the various techniques used have been applied in similar quantitative experiments and are expected to provide unbiased and reliable results when sample sizes are adequate.

Estimates of mean length by sex and age and their estimated variances were also calculated for each system (Appendix A5). These estimates are either the unbiased estimates reported in the publications cited above, or made using the spawning ground samples as noted above.

# RESULTS

In 2000, 35 locations, 25 of which were designated index areas, were surveyed specifically for chinook salmon escapement (Appendix A3). Surveys generally progressed as planned.

From 1984 to 1993, the estimated escapement of chinook salmon in Southeast Alaska increased steadily for 10 years, peaking in 1993 (Appendix A2). This was due primarily to strong returns to the Taku, Stikine, and Chilkat rivers, which together make up over 75% of the summed escapement goals in the region. Escapements declined in 1994 and 1995 and then peaked again in 1996 and 1997 as a result of record high escapements in the Taku River. In 1998 and 1999 escapements to the Taku River declined dramatically which contributed to the lowest estimated escapements to Southeast Alaska since 1984.

The estimated escapement (expanded) of chinook salmon for all Southeast Alaska and transboundary rivers in 2000 was 94,428 (Table 1), a 31% increase from the estimated 72,010 fish in 1999. The estimates for 1999 and prior years were revised from previous reports using updated estimates. The estimated total for the region increased, primarily due to increases in estimated escapements to the Taku and Stikine rivers.

### TAKU RIVER

The count of 5,772 large chinook salmon in the five index areas of the Taku River was an increase over the low escapement in 1999 (Table 2) however counts in all tributaries remained below average (Table 3). Counts increased steadily from 1983 to 1993, and escapements exceeded the upper limit of the BEG four times in the 90s (Figure 2).

Counts were expanded by a survey expansion factor of 5.2 and the Tseta Creek counts were excluded. The expansion factor was revised in 1999 based on five years of mark-recapture experiments on the Taku River (Table 4) (McPherson et al. 2000). McPherson et al. recommend an escapement goal range of 30,000 to 55,000 large spawners. These changes were adopted by the Transboundary River Technical Committee (TBTC) and the Chinook Technical Committee (CTC) of the PSC. The revised PSC goal uses counts in five index areas expanded by 5.2, which corresponds to an index goal range of 5,800 to 10,600 fish. Expansion of the survey counts of 5,772 by 5.2 results in an escapement estimate of 30,014 large chinook salmon in 2000. The preliminary estimate from a mark-recapture experiment conducted in 2000 is 30,529 (SE = 5,417) large fish (McPherson et al. 2002).

Age, sex and length data were collected from carcasses at the Nakina, Nahlin, and Tatsamenie rivers and also from live fish at Tatsamenie River sampled with angling gear (Appendix A4H; A5H).

**Table 2.–Counts of spawning chinook salmon in index areas of the Taku River, 1951–2000.**

| Year[a] | Nakina River | | Nahlin River | | Kowatua River | | Tatsamenie River | | Dudidontu River | | 5 Trib. total | Tseta Creek[f] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1951 | 5,000 | (F)[b] | 1,000 | (F) | – | | – | | 400 | (F) | 6,400 | 100 | (F) |
| 1952 | 9,000 | (F) | – | | – | | – | | – | | 9,000 | | |
| 1953 | 7,500 | (F) | – | | – | | – | | – | | 7,500 | | |
| 1954 | 6,000 | (F) | – | (F) | – | | – | | – | | 6,000 | | |
| 1955 | 3,000 | (F) | – | | – | | – | | – | | 3,000 | | |
| 1956 | 1,380 | (F) | – | | – | | – | | – | | 1,380 | | |
| 1957 | 1,500[c] | (F/W) | – | | – | | – | | – | | 1,500 | | |
| 1958 | 2,500[c] | (F/W) | 2,500 | (A) | – | | – | | 4,500 | (A) | 9,500 | | |
| 1959 | 4,000[c] | (F/W) | – | | – | | – | | – | | 4,000 | | |
| 1962 | – | | 216 | (A) | – | | – | | 25 | (A) | 241 | 81 | (A) |
| 1965 | 3,050 | (H) | 35 | (A) | 200 | P(A) | 50 | P(A) | 110 | (A) | 3,445 | 18 | (A) |
| 1966 | 3,700 | P(A) | 300 | (A) | 14 | P(A) | 100 | P(A) | 252 | (A) | 4,366 | 151 | (A) |
| 1967 | 700 | (A) | 300 | P(A) | 250 | P(A) | – | | 600 | (A) | 1,850 | 350 | (A) |
| 1968 | 300 | P(A) | 450 | (A) | 1,100 | (A) | 800 | E(A) | 590 | (A) | 3,240 | 230 | (A) |
| 1969 | 3,500 | (A) | – | | 3,300 | (A) | 800 | E(A) | – | | 7,600 | – | |
| 1970 | – | | 26 | (A) | 1,200 | P(A) | 530 | E(A) | 10 | (A) | 1,766 | 25 | (A) |
| 1971 | 500 | (A) | 473 | (A) | 1,400 | E(A) | 360 | E(A) | 165 | (A) | 2,898 | – | (A) |
| 1972 | 1,000 | (F) | 280 | (A) | 170 | (A) | 132 | (A) | 102 | (A) | 1,684 | 80 | P(A) |
| 1973 | 2,000 | N(H) | 300 | E(H) | 100 | N(H) | 200 | E(H) | 200 | E(H) | 2,800 | 4 | (A) |
| 1974 | 1,800 | E(H) | 900 | E(H) | 235 | (A) | 120 | (A) | 24 | (A) | 3,079 | 4 | (A) |
| 1975 | 1,800 | E(H) | 274 | E(H) | – | | – | | 15 | N(H) | 2,089 | – | |
| 1976 | 3,000 | E(H) | 725 | E(H) | 341 | P(A) | 620 | E(H) | 40 | (H) | 4,726 | – | |
| 1977 | 3,850 | E(H) | 650 | E(H) | 580 | E(A) | 573 | E(H) | 18 | (H) | 5,671 | – | |
| 1978 | 1,620 | E(H) | 624 | E(H) | 490 | N(H) | 550 | E(H) | – | | 3,284 | 21 | E(H) |
| 1979 | 2,110 | E(H) | 857 | E(H) | 430 | N(H) | 750 | E(H) | 9 | E(H) | 4,156 | – | |
| 1980 | 4,500 | E(H) | 1,531 | E(H) | 450 | N(H) | 905 | E(H) | 158 | E(H) | 7,544 | – | |
| 1981 | 5,110 | E(H) | 2,945 | E(H) | 560 | N(H) | 839 | E(H) | 74 | N(H) | 9,528 | 258 | N(H) |
| 1982 | 2,533 | E(H) | 1,246 | E(H) | 289 | N(H) | 387 | N(H) | 130 | N(H) | 4,585 | 228 | N(H) |
| 1983 | 968 | E(H) | 391 | N(H) | 171 | E(H) | 236 | E(H) | 117 | E(H) | 1,883 | 179 | N(H) |
| 1984[d] | 1,887 | (H) | 951 | (H) | 279 | E(H) | 616 | E(H) | – | | 3,733 | 176 | (H) |
| 1985 | 2,647 | N(H) | 2,236 | E(H) | 699 | E(H) | 848 | E(H) | 475 | (H) | 6,905 | 303 | E(H) |
| 1986 | 3,868 | (H) | 1,612 | E(H) | 548 | E(H) | 886 | E(H) | 413 | E(H) | 7,327 | 193 | E(H) |
| 1987 | 2,906 | E(H) | 1,122 | E(H) | 570 | E(H) | 678 | E(H) | 287 | E(H) | 5,563 | 180 | E(H) |
| 1988 | 4,500 | E(H) | 1,535 | E(H) | 1,010 | E(H) | 1,272 | E(H) | 243 | E(H) | 8,560 | 66 | E(H) |
| 1989 | 5,141 | E(H) | 1,812 | E(H) | 601[e] | (W) | 1,228 | E(H) | 204 | E(H) | 8,986 | 494 | E(H) |
| 1990 | 7,917 | E(H) | 1,658 | E(H) | 614[e] | (W) | 1,068 | N(H) | 820 | E(H) | 12,077 | 172 | N(H) |
| 1991 | 5,610 | E(H) | 1,781 | E(H) | 570 | N(H) | 1,164 | E(H) | 804 | E(H) | 9,929 | 224 | N(H) |
| 1992 | 5,750 | E(H) | 1,821 | E(H) | 782 | E(H) | 1,624 | N(H) | 768 | N(H) | 10,745 | 313 | N(H) |
| 1993 | 6,490 | E(H) | 2,128 | N(H) | 1,584 | E(H) | 1,491 | E(H) | 1,020 | E(H) | 12,713 | 491 | N(H) |
| 1994 | 4,792 | N(H) | 2,418 | E(H) | 410 | P(H) | 1,106 | N(H) | 573 | N(H) | 9,299 | 614 | E(H) |
| 1995 | 3,943 | E(H) | 2,069 | E(H) | 550 | N(H) | 678 | N(H) | 731 | E(H) | 7,971 | 786 | E(H) |
| 1996 | 7,720 | E(H) | 5,415 | E(H) | 1,620 | N(H) | 2,011 | N(H) | 1,810 | N(H) | 18,576 | 1,201 | N(H) |
| 1997 | 6,095 | E(H) | 3,655 | E(H) | 1,360 | N(H) | 1,148 | N(H) | 943 | N(H) | 13,201 | 648 | N(H) |
| 1998 | 2,720 | E(H) | 1,294 | N(H) | 473 | N(H) | 675 | E(H) | 807 | E(H) | 5,969 | 360 | E(H) |
| 1999 | 1,900 | N(H) | 532 | N(H) | 561 | E(H) | 431 | N(H) | 527 | E(H) | 3,951 | 221 | N(H) |
| 2000 | 2,907 | N(H) | 728 | P(H) | 702 | N(H) | 953 | N(H) | 482 | N(H) | 5,772 | 160 | N(H) |
| 90–99 Average | 5,294 | | 2,277 | | 852 | | 1,140 | | 880 | | 10,443 | 503 | |

[a] Counts before 1975 may not be comparable due to changes in survey dates and methods; foot surveys may include jacks.

[b] (F) = foot survey, — = no survey conducted, (A) = fixed-wing aircraft, (H) = helicopter, P = survey conditions hampered by glacial or turbid waters, N = normal water flows and turbidity–average survey conditions, E = survey conditions excellent.

[c] Partial survey of Nakina River in 1957–59; comparisons made from carcass weir (W) counts.

[d] Surveys in 1984 conducted by DFO; partial survey of Tseta Creek and Nahlin.

[e] Carcass weir at Kowatua River used to partially count escapement due to unfavorable water conditions, 1989, 1990.

[f] Tseta Creek removed from index areas in 1999.

**Table 3.–Distribution of spawning chinook salmon among index areas of the Taku River during years when all index areas were surveyed.**

| Year | Nakina River | % | Nahlin River | % | Kowatua River | % | Tatsamenie River | % | Dudidontu River | % | Tseta Creek | % | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1981 | 5,110 | 52 | 2,945 | 30 | 560 | 6 | 839 | 9 | 74 | 1 | 258 | 3 | 9,786 |
| 1982 | 2,533 | 53 | 1,246 | 26 | 289 | 6 | 387 | 8 | 130 | 3 | 228 | 5 | 4,813 |
| 1983 | 968 | 47 | 391 | 19 | 171 | 8 | 236 | 11 | 117 | 6 | 179 | 9 | 2,062 |
| 1985 | 2,647 | 37 | 2,236 | 31 | 699 | 10 | 848 | 12 | 475 | 7 | 303 | 4 | 7,208 |
| 1986 | 3,868 | 51 | 1,612 | 21 | 548 | 7 | 886 | 12 | 413 | 5 | 193 | 3 | 7,520 |
| 1987 | 2,906 | 51 | 1,122 | 20 | 570 | 10 | 678 | 12 | 287 | 5 | 180 | 3 | 5,743 |
| 1988 | 4,500 | 52 | 1,535 | 18 | 1,010 | 12 | 1,272 | 15 | 243 | 3 | 66 | 1 | 8,626 |
| 1989 | 5,141 | 54 | 1,812 | 19 | 601 | 6 | 1,228 | 13 | 204 | 2 | 494 | 5 | 9,480 |
| 1990 | 7,917 | 65 | 1,658 | 14 | 614 | 5 | 1,068 | 9 | 820 | 7 | 172 | 1 | 12,249 |
| 1991 | 5,610 | 55 | 1,781 | 18 | 570 | 6 | 1,164 | 11 | 804 | 8 | 224 | 2 | 10,153 |
| 1992 | 5,750 | 52 | 1,821 | 16 | 782 | 7 | 1,624 | 15 | 768 | 7 | 313 | 3 | 11,058 |
| 1993 | 6,490 | 49 | 2,128 | 16 | 1,584 | 12 | 1,491 | 11 | 1,020 | 8 | 497 | 4 | 13,210 |
| 1994 | 4,792 | 48 | 2,418 | 24 | 410 | 4 | 1,106 | 11 | 573 | 6 | 614 | 6 | 9,913 |
| 1995 | 3,943 | 45 | 2,069 | 24 | 550 | 6 | 678 | 8 | 731 | 8 | 786 | 9 | 8,757 |
| 1996 | 7,720 | 39 | 5,415 | 27 | 1,620 | 8 | 2,011 | 10 | 1,810 | 9 | 1,201 | 6 | 19,777 |
| 1997 | 6,095 | 44 | 3,655 | 26 | 1,360 | 10 | 1,148 | 8 | 943 | 7 | 648 | 5 | 13,849 |
| 1998 | 2,720 | 43 | 1,294 | 20 | 473 | 7 | 675 | 11 | 807 | 13 | 360 | 6 | 6,329 |
| 1999 | 1,900 | 46 | 532 | 13 | 561 | 13 | 431 | 10 | 527 | 13 | 221 | 5 | 4,172 |
| Average | 4,396 | 49 | 1,916 | 21 | 720 | 8 | 985 | 11 | 591 | 7 | 374 | 4 | 8,981 |
| 2000 | 2,907 | 49 | 728 | 12 | 702 | 12 | 953 | 16 | 482 | 8 | 160 | 3 | 5,932 |

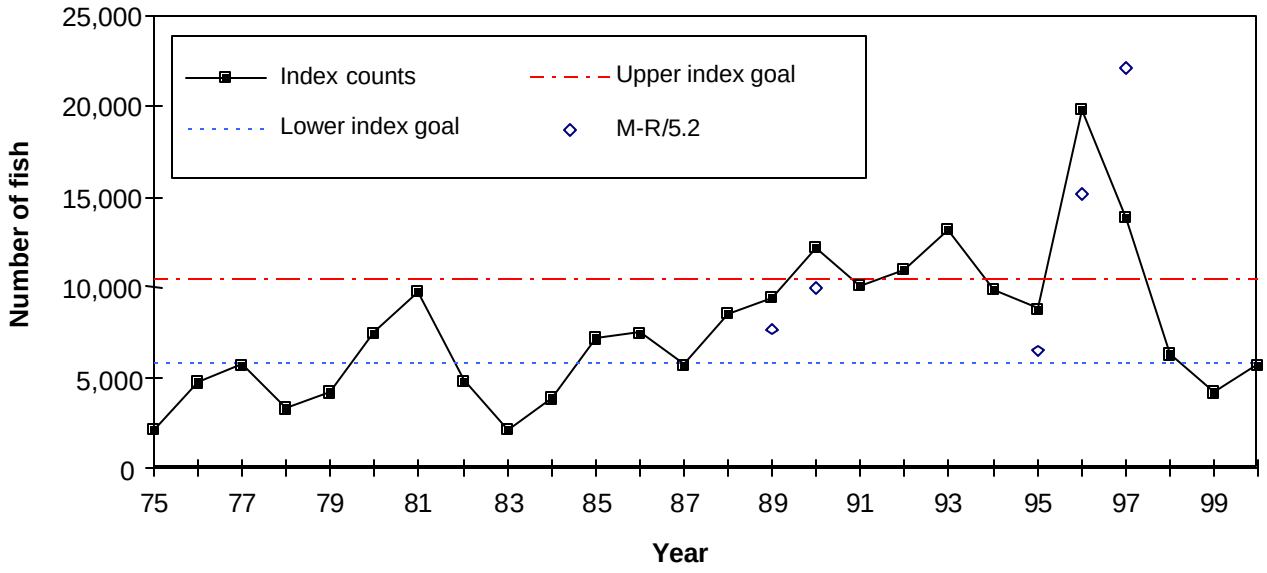


**Figure 2.–Counts of chinook salmon in index areas of the Taku River, 1975–2000 and mark-recapture estimates divided by expansion factor of 5.2.** Lines show upper and lower limits of index escapement goal range.

**Table 4.–Taku River index counts, mark-recapture estimates of escapement, and percent of escapement observed.**

| Year | Counts[a] | M-R | SE | % Observed |
|---|---|---|---|---|
| 1989 | 8,986 | 40,329 | 5,646 | 22.3 |
| 1990 | 12,077 | 52,142 | 9,326 | 23.2 |
| 1995 | 7,971 | 33,805 | 5,060 | 23.6 |
| 1996 | 18,576 | 79,019 | 9,048 | 23.5 |
| 1997 | 13,201 | 114,938 | 17,888 | 11.5 |
| Average | 12,162 | 64,047 | | 19.0 |
| 1998 | 6,329 | not available | | |
| 1999 | 4,172 | not available | | |
| 2000 | 5,772 | 30,529 | 5,417 | 18.9 |

[a] sum of five tributaries, not 6 as prior to 1999.

## STIKINE RIVER

At the Little Tahltan River weir 6,640 large chinook salmon were counted in 2000. The weir count was 140% of the count of 4,738 in 1999 and above the 1990–1999 average of 5,639 (Table 5). Aerial surveys of Beatty Creek and the glacially occluded mainstem Tahltan River were discontinued as recommended in Bernard et al., (2000).

The peak aerial survey flown in 2000 obtained a count of 2,720 large chinook salmon above the Little Tahltan River weir. The peak survey count was 41.0% of the total escapement through the weir. From 1985 to 1999, the proportion of the total escapement of chinook salmon counted during peak aerial surveys has ranged from 28.4% to 56.6% and averaged 37.7% (Table 5). The proportion of the total escapement observed in a single survey often declined after the peak of spawning as fish died or were removed by predators. In 1998 and 1999, survey conditions were not unusual and no explanation is offered for the lower than average proportion of escapement observed.

Age, sex and length data was collected from 787 live fish sampled at the Little Tahltan River weir and from 432 post-spawning and dead fish sampled at Verrett Creek (Appendix A4E, A5E).

Based on a stock-recruit model, the BEG was revised in 1999 to a range of 14,000 to 28,000 large chinook total in the Stikine River drainage or 2,700 to 5,300 at the Little Tahltan weir (Bernard et al. 2000). The 2000 weir count was above the revised escapement goal range for the Little Tahltan River, which has been met or exceeded every year since the weir was installed in 1985 (Figure 3).

**Table 5.–Counts of spawning chinook salmon in the Little Tahltan River, Stikine River, 1975–2000.**

| | | Above- | | Aerial survey | | |
|---|---|---|---|---|---|---|
| Year | Weir count | weir catch[b] | Escape-ment | Peak count[a, c] | | Percent counted |
| 1975 | - | | | 700 | E(H) | |
| 1976 | - | | | 400 | N(H) | |
| 1977 | - | | | 800 | P(H) | |
| 1978 | - | | | 632 | E(H) | |
| 1979 | - | | | 1,166 | E(H) | |
| 1980 | - | | | 2,137 | N(H) | |
| 1981 | - | | | 3,334 | E(H) | |
| 1982 | - | | | 2,830 | N(H) | |
| 1983 | - | | | 594 | E(H) | |
| 1984 | - | | | 1,294 | (H) | |
| 1985 | 3,114 | 0 | 3,114 | 1,598 | E(H) | 51.3 |
| 1986 | 2,891 | 0 | 2,891 | 1,201 | E(H) | 41.5 |
| 1987 | 4,783 | 0 | 4,783 | 2,706 | E(H) | 56.6 |
| 1988 | 7,292 | 0 | 7,292 | 3,796 | E(H) | 52.1 |
| 1989 | 4,715 | 0 | 4,715 | 2,527 | E(H) | 53.6 |
| 1990 | 4,392 | 0 | 4,392 | 1,755 | E(H) | 40.0 |
| 1991 | 4,506 | 0 | 4,506 | 1,768 | E(H) | 39.2 |
| 1992 | 6,627 | 0 | 6,627 | 3,607 | E(H) | 54.4 |
| 1993 | 11,449 | 12 | 11,437 | 4,010 | P(H) | 35.1 |
| 1994 | 6,387 | 14 | 6,373 | 2,422 | N(H) | 38.0 |
| 1995 | 3,072 | 0 | 3,072 | 1,117 | N(H) | 36.4 |
| 1996 | 4,821 | 0 | 4,821 | 1,920 | N(H) | 39.8 |
| 1997 | 5,557 | 10 | 5,547 | 1,907 | N(H) | 34.4 |
| 1998 | 4,879 | 6 | 4,873 | 1,385 | N(H) | 28.4 |
| 1999 | 4,738 | 0 | 4,738 | 1,379 | N(H) | 29.1 |
| 90-99 Ave. | 5,639 | 4 | 5,635 | 2,127 | | 37.7 |
| 2000 | 6,640 | 9 | 6,631 | 2,720 | N(H) | 41.0 |

[a] (F) = foot survey; N = normal survey conditions; (H) = helicopter survey; P = survey conditions hampered by glacial or turbid waters; E = excellent survey conditions; — = no survey conducted .

[b] Above weir harvest includes broodstock collection and Aboriginal fishery catch.

[c] Peak count equals peak survey above weir plus count below weir on that date.

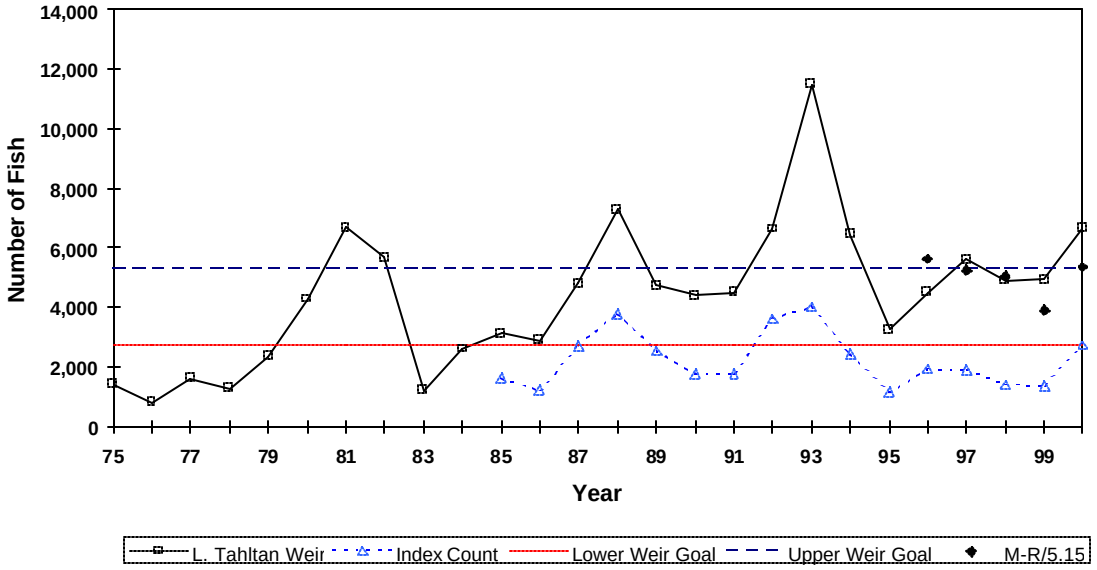


**Figure 3.–Counts of chinook salmon at the Little Tahltan River weir, Stikine River, 1975–2000.** Mark-recapture estimates divided by expansion factor of 5.15. Data for 1985-2000 from weir counts, 1975-1984 estimated by doubling index count. Lines show upper and lower limits of escapement goal range.

Expansion of the 2000 Little Tahltan weir count of 6,640 large chinook salmon by the survey expansion factor (5.15) produced a total Stikine River escapement estimate of 34,196 large chinook salmon. The estimate of total escapement to the Stikine River from a mark-recapture experiment conducted in 2000 is 27,531 (SE = 3,168, DerHovanisian et al., 2001) which is at the upper end of the escapement goal range for the drainage.

## ANDREW CREEK

The 2000 survey count of chinook salmon in Andrew Creek was 690 fish, compared to 605 in 1999 (Table 6). In 1998, a spawner recruit analysis was completed and a biological escapement goal range of 650 to 1,500 total (~325-750 index count) large spawners was adopted (Clark et al. 1998). Since 1985, Andrew Creek escapements have exceeded the lower limit of the goal in all but two years (Figure 4).

From 1976 to 1984 a weir was operated on Andrew Creek to provide brood stock for hatcheries. Total spawners removed from the creek ranged from 12 in 1978 to 275 in 1982 (Pahlke 1995). Surveys were also conducted on the system during four of those years and, on the basis of those paired counts, the survey expansion factor was revised in 1995 from 1.6 (1/.625) to 2.0 (see Table 1). No survey expansion was necessary for the years when the weir provided total escapement counts (Appendix A2).

Two aerial, one helicopter, and one foot survey were conducted the same week in August, 2000 with 840, 690, 583, and 643 chinook salmon counted respectively (Appendix A3). The aerial count was used as the peak count based on experience from years when the weir was operated and surveys were conducted by the same observer who conducted the aerial survey (Clark et al. 1998).

Age, sex, and length data was collected from 128 pre-spawning fish in Andrew Creek, using angling gear and dip nets (Appendix A4F, A5F).

**Table 6.–Counts of spawning chinook salmon in selected rivers in central Southeast Alaska, 1956–2000.** (A) = survey conducted by fixed-wing aircraft; — = no survey conducted or data not comparable; (F/A) = combined foot and aerial count; (F) = survey conducted by walking; (H) = survey conducted by helicopter; (W/F) = weir and foot count; N = normal conditions; E = excellent conditions; P = poor conditions; (B) = escapement surveyed from boat.

| | | | | | | | | | | | Bradfield River | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Andrew Cr.[a] | | North Arm | | Clear Creek | | Harding River | | Aaron Creek | | N. Fork | | E. Fork | |
| 1956 | 4,500 | (A) | – | | – | | – | | – | | – | | – | |
| 1957 | 3,000 | (F/A) | – | | – | | – | | – | | – | | – | |
| 1958 | 2,500 | (F/A) | – | | – | | – | | – | | – | | – | |
| 1959 | 150 | (F/A) | – | | – | | – | | – | | – | | – | |
| 1960 | 287 | (F) | 200 | (F)N | – | | – | | – | | – | | – | |
| 1961 | 103 | (F) | 138 | (F) | – | | – | | – | | – | | – | |
| 1962 | 300 | (A) | 80 | (A)N | – | | – | | – | | – | | – | |
| 1963 | 500 | (A/H) | 187 | (F) | – | | – | | – | | – | | – | |
| 1964 | 400 | (H) | – | | – | | | | – | | – | | – | |
| 1965 | 100 | (A) | – | | – | | 25 | | – | | – | | – | |
| 1966 | 75 | (A) | – | | – | | – | | – | | – | | – | |
| 1967 | 30 | (A) | – | | – | | – | | – | | – | | – | |
| 1968 | 15 | – | – | | – | | – | | – | | – | | – | |
| 1969 | 12 | (A) | – | | – | | – | | – | | – | | – | |
| 1970 | | – | – | | – | | – | | – | | – | | – | |
| 1971 | 305 | (A) | – | | – | | – | | – | | – | | – | |
| 1972 | | – | – | | – | | – | | – | | – | | – | |
| 1973 | 40 | (A) | – | | – | | 10 | | – | | – | | – | |
| 1974 | 129 | (A) | – | | – | | 35 | | – | | – | | – | |
| 1975 | 260 | (F) | – | | – | | – | | – | | – | | – | P(A) |
| 1976 | 404 | (W/F) | – | | – | | 12 | N(A) | 24 | | – | | 13 | |
| 1977 | 456 | (W/F) | – | | – | | 410 | E(A) | | | – | | | |
| 1978 | 388 | (W/F) | 24 | E(F) | – | | 12 | N(H) | – | | – | | 63 | P(A) |
| 1979 | 327 | (W/F) | 16 | E(F) | – | | – | | – | | – | | 10 | P(A) |
| 1980 | 282 | (W/F) | 68 | F(N) | – | | – | | – | | 30 | P(H) | – | |
| 1981 | 536 | (W/F) | 84 | E(F) | 4 | P(F) | 28 | P(H) | 12 | | 84 | P(H) | – | |
| 1982 | 672 | (W/F) | 138 | F(N) | 188 | N(F) | 8 | E(A) | – | | | | – | |
| 1983 | 366 | (W/F) | 15 | F(N) | – | | 15 | P(A) | – | | 55 | N(H) | – | |
| 1984 | 389 | (W/F) | 31 | F(N) | – | | 35 | N(B) | – | | – | | – | |
| 1985 | 320 | E(F) | 44 | E(F) | – | | 243 | N(F) | 179 | | 58 | N(A) | 85 | N(A) |
| 1986 | 708 | N(F) | 73 | F(N) | 45 | E(A) | 240 | N(B) | 178 | | 104 | E(A) | 215 | E(A) |
| 1987 | 788 | E(H) | 71 | E(F) | 122 | N(F) | 40 | E(A) | 51 | | 186 | P(A) | 175 | P(A) |
| 1988 | 564 | N(F) | 125 | F(N) | 167 | N(F) | 70 | P(A) | 325 | | 680 | N(A) | 410 | N(A) |
| 1989 | 530 | E(F) | 150 | A(N) | 49 | N(H) | 80 | P(A) | 135 | | 193 | P(A) | 132 | P(A) |
| 1990 | 664 | E(F) | 83 | F(N) | 33 | P(H) | 24 | P(A) | – | | – | | – | |
| 1991 | 400 | N(A) | 38 | A(N) | 46 | N(A) | 42 | N(F) | – | | 81 | P(A) | 320 | P(A) |
| 1992 | 778 | E(H) | 40 | E(F) | 31 | N(A) | 48 | P(A) | 30 | P(A) | – | | – | |
| 1993 | 1,060 | E(F) | 53 | E(F) | – | | 40 | N(A) | – | | 33 | P(A) | 118 | P(A) |
| 1994 | 572 | E(H) | 58 | E(F) | 10 | N(A) | 87 | N(H) | 27 | P(H) | 15 | P(H) | – | |
| 1995 | 343 | P(A) | 28 | A(P) | 1 | E(A) | 38 | N(H) | 65 | N(H) | 16 | P(A) | 43 | P(A) |
| 1996 | 335 | N(F) | 35 | F(N) | 21 | N(A) | 75 | N(A) | 15 | N(H) | 78 | N(A) | 48 | P(A) |
| 1997 | 293 | N(F) | – | | – | | – | | 55 | N(H) | - | | 30 | A(P) |
| 1998 | 487 | E(F) | 35 | N(A) | 28 | N(A) | 75 | N(A) | 69 | P(A) | - | | 66 | P(A) |
| 1999 | 605 | E(A) | 22 | N(A) | – | | – | | 550 | N(A) | – | | 5 | P(A) |
| 90–99 | 554 | | 44 | | 24 | | 54 | | 116 | | 45 | | 90 | |
| 2000 | 690 | N(A) | 35 | N(A) | – | | – | | 16 | P(A) | – | | 33 | N(A) |

[a] Andrew Creek total return equals sum of weir count, counts below weir, and on North Fork, minus egg take, 1976–1984.

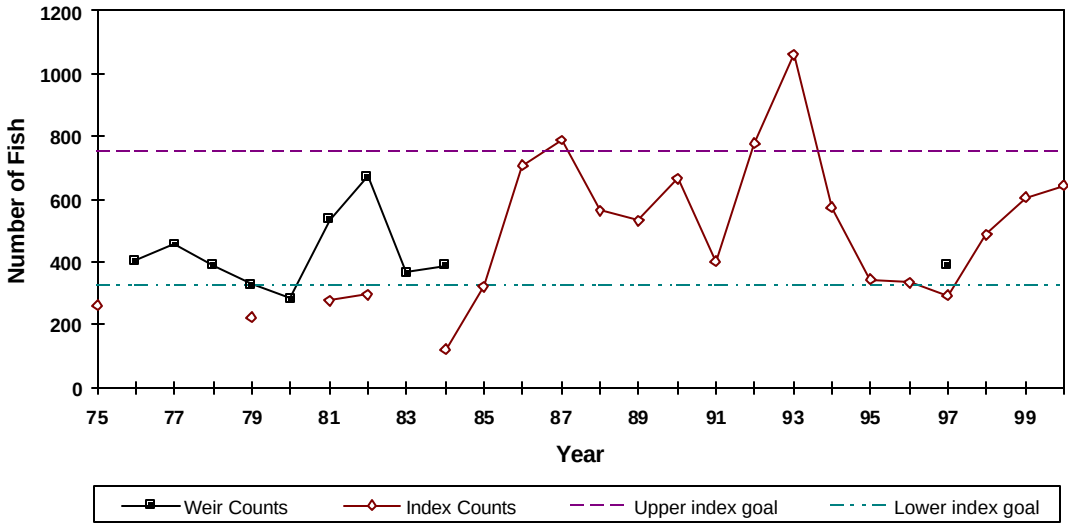


**Figure 4.–Counts of chinook salmon at the Andrew Creek Weir, 1976–1984, 1997 and in aerial/foot surveys, 1975, 1985–2000.** Lines show upper and lower bounds of index escapement goal range.

## ALSEK RIVER

The count of large chinook salmon through the Klukshu River weir in 2000 was 1,365 fish, a 38% decrease from the count of 2,193 in 1999 (Table 7; Figure 5). The escapement to the Klukshu, estimated by subtracting the Aboriginal Fishery (AF) harvest (20) and sport harvest (0) above the weir from the weir count, was 1,343 fish, within the escapement goal range of 1,100 to 2,300, adopted in 1998 (McPherson et al. 1998b). All of the sport and most of the AF harvest was below the weir.

No aerial survey of the Klukshu River was conducted in 2000. However, in helicopter surveys we counted 152 large chinook salmon in the Takhanne River, 163 in the Blanchard River, 33 in Goat Creek and in a foot survey 47 fish were counted in Low Fog Creek.

There is no agreement in the PSC on use of expansion factors for the Alsek River; expansion factors used in the past have ranged from 1.56 to 2.5, based on assumptions that the Klukshu River represented 40 to 64 percent of the escapement to the entire drainage (Pahlke 1997b). Results from the 1998 tagging study to estimate distribution and escapement of Alsek River chinook salmon indicated that the Klukshu River accounts for about 16–24% of the chinook salmon escapement to the Alsek River drainage (Pahlke et al. 1999). Results from the 1999 study also indicate less than 25% of the escapement to the Alsek drainage is accounted for in the Klukshu River (Pahlke and Etherton 2001b). On the basis of the results of those two studies, the expansion factor was revised to 4.0. The escapement to the entire drainage was then estimated by expanding the weir count by 4.0 and subtracting the above-weir (20) harvest, resulting in an estimated escapement of 5,542 fish. Preliminary results of a mark-recapture experiment indicate a total escapement of 8,295 large chinook salmon (SE = 1,625; Pahlke and Etherton, 2001b).

Age, sex and length data were collected from 765 live fish sampled at the Klukshu River weir, other spawning areas and at a lower river tagging project (Appendix A4J; A5J).

## UNUK RIVER

In 2000, 1,341 large chinook salmon were counted in all index areas of the Unuk River (Table 8), a count that was above the recent 10-

**Table 7.–Escapement of chinook salmon to the Klukshu River and counts of spawning adults in other tributaries of the Alsek River, 1962–2000.** (A) = aerial survey from fixed wing aircraft; (H) = helicopter survey; E = excellent survey conditions; N = normal conditions; P = poor conditions; – = no survey.

| | Klukshu River | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Aerial | | Weir | Above-weir harvest | | | Escape- | Blanchard | | Takhanne | | Goat | | |
| Year[a] | count | | count | AF | Sport | Brood | ment[b] | River | | River | | Creek | | Total[c] |
| 1962 | 86 | A | – | – | – | | 86 | – | | – | | – | | 86 |
| 1963 | – | | – | – | – | | – | – | | – | | – | | 0 |
| 1964 | 20 | A | – | – | – | | 20 | – | | – | | – | | 20 |
| 1965 | 100 | | – | – | – | | 100 | 100 | | 250 | | – | | 450 |
| 1966 | 1,000 | | – | – | – | | 1,000 | 100 | | 200 | | – | | 1,300 |
| 1967 | 1,500 | | – | – | – | | 1,500 | 200 | | 275 | | – | | 1,975 |
| 1968 | 1,700 | | – | – | – | | 1,700 | 425 | | 225 | | – | | 2,350 |
| 1969 | 700 | | – | – | – | | 700 | 250 | | 250 | | – | | 1,200 |
| 1970 | 500 | | – | – | – | | 500 | 100 | | 100 | | – | | 700 |
| 1971 | 300 | A | – | – | – | | 300 | – | | – | | – | | 300 |
| 1972 | 1,100 | | – | – | – | | 1,100 | 12 | (A) | 250 | | – | | 1,362 |
| 1973 | – | | – | – | – | | – | – | | 49 | (A) | – | | 49 |
| 1974 | 62 | | – | – | – | | 62 | 52 | (A) | 132 | | – | | 246 |
| 1975 | 58 | | – | – | – | | 58 | 81 | (A) | 177 | (A) | – | | 316 |
| 1976 | – | | 1,278 | 150 | 64 | | 1,064 | – | | – | | – | | 1,064 |
| 1977 | – | | 3,144 | 350 | 96 | | 2,698 | – | | – | | – | | 2,698 |
| 1978 | – | | 2,976 | 350 | 96 | | 2,530 | – | | – | | – | | 2,530 |
| 1979 | – | | 4,404 | 1,300 | 0 | | 3,104 | – | | – | | – | | 3,104 |
| 1980 | – | | 2,673 | 150 | 0 | | 2,487 | – | | – | | – | | 2,487 |
| 1981 | – | | 2,113 | 150 | 0 | | 1,963 | 35 | (H) | 11 | (H) | – | | 2,009 |
| 1982 | 633 | N(H | 2,369 | 400 | 0 | | 1,969 | 59 | (H) | 241 | (H) | 13 | (H) | 2,282 |
| 1983 | 917 | N(H | 2,537 | 300 | 0 | | 2,237 | 108 | (H) | 185 | (H) | – | | 2,530 |
| 1984 | – | | 1,672 | 100 | 0 | | 1,572 | 304 | (H) | 158 | (H) | 28 | (H) | 2,062 |
| 1985 | – | | 1,458 | 175 | 0 | | 1,283 | 232 | (H) | 184 | (H) | – | | 1,699 |
| 1986 | 738 | P(H) | 2,709 | 102 | 0 | | 2,607 | 556 | (H) | 358 | (H) | 142 | (H) | 3,663 |
| 1987 | 933 | E(H | 2,616 | 125 | 0 | | 2,491 | 624 | (H) | 395 | (H) | 85 | (H) | 3,595 |
| 1988 | – | | 2,037 | 43 | 0 | | 1,994 | 437 | E(H) | 169 | E(H) | 54 | E(H) | 2,654 |
| 1989 | 893 | E(H | 2,456 | 234 | 0 | 20 | 2,202 | – | | 158 | E(H) | 34 | E(H) | 2,394 |
| 1990 | 1,381 | E(H | 1,915 | 202 | 0 | 15 | 1,698 | – | | 325 | E(H) | 32 | E(H) | 2,055 |
| 1991 | – | | 2,489 | 241 | 0 | 25 | 2,223 | 121 | N(H) | 86 | E(H) | 63 | E(H) | 2,493 |
| 1992 | 261 | P(H) | 1,367 | 88 | 0 | 36 | 1,243 | 86 | P(H) | 77 | N(H) | 16 | N(H) | 1,422 |
| 1993 | 1,058 | N(H | 3,303 | 64 | 0 | 18 | 3,221 | 326 | N(H) | 351 | E(H) | 50 | N(H) | 3,948 |
| 1994 | 1,558 | N(H | 3,727 | 99 | 0 | 8 | 3,620 | 349 | N(H) | 342 | E(H) | 67 | N(H) | 4,378 |
| 1995 | 1,053 | E(H | 5,678 | 260 | 0 | 21 | 5,397 | 338 | P(H) | 260 | P(H) | – | | 5,995 |
| 1996 | 788 | N(H | 3,599 | 215 | 0 | 2 | 3,382 | 132 | N(H) | 230 | N(H) | 12 | N(H | 3,756 |
| 1997 | 718 | P(H) | 2,989 | 160 | 0 | 0 | 2,829 | 109 | P(H) | 190 | P(H) | – | | 3,128 |
| 1998 | – | | 1,364 | 17 | 0 | 0 | 1,347 | 71 | P(H) | 136 | N(H) | 39 | N(H) | 1,593 |
| 1999 | 500 | P(H) | 2,193 | 27 | 0 | 0 | 2,166 | 371 | N(H) | 194 | N(H) | 51 | N(H) | 2,782 |
| 89–98 avg. | 964 | | 2,889 | 158 | 0 | 15 | 2,716 | 192 | | 216 | | 39 | | 3,116 |
| 2000 | –- | | 1,365 | 20 | 0 | 0 | 1,343 | 168 | N(H) | 152 | N(H) | 33 | N(H) | 1,698 |

[a] Escapement counts prior to 1975 may not be comparable due to differences in survey dates and counting methods.

[b] Klukshu River escapement = weir count minus above weir Aboriginal Fishery (AF) catch and broodstock.

[c] Total = Klukshu escapement plus aerial counts of other systems.

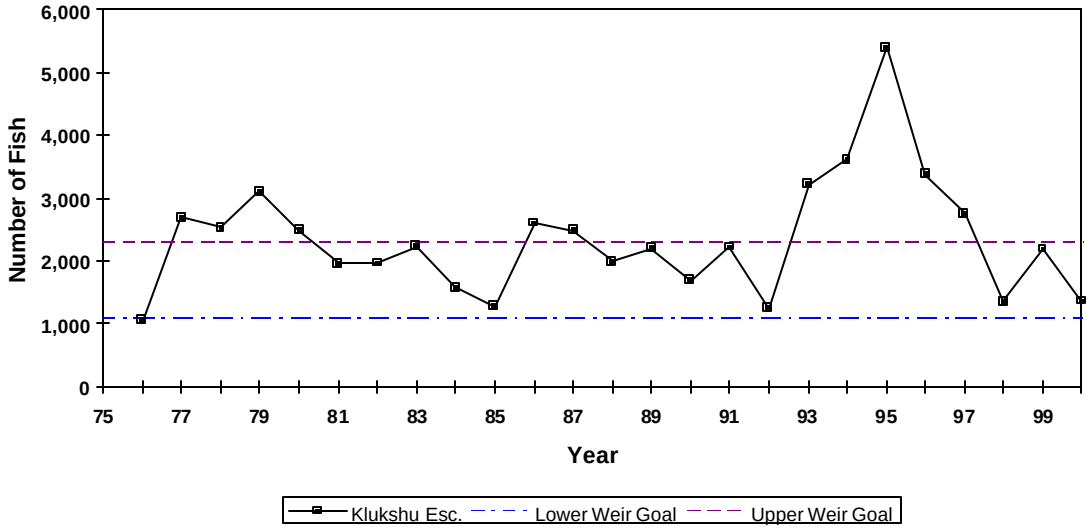


**Figure 5. –Weir count of chinook salmon to the Klukshu River tributary of the Alsek River, 1975–2000**. Lines show upper and lower limits of revised escapement goal range.

year average in 5 out of 6 index areas (Table 9). The total count was at the upper end of the index goal range of 650 to 1,400 (McPherson and Carlile 1997). Index counts have been below the lower end of the escapement goal range only three times since 1981 (Figure 6).

Nineteen large chinook salmon were counted in Boundary Creek in 2000. A change in the river between 1991 and 1994, which had revealed more spawning area than previously observed in Boundary Creek, has again changed, resulting in lower counts. Boundary Creek is not part of the Unuk River index area and was not included in either the summed counts for the watershed nor in the expanded count.

Based on results of mark-recapture and radio-tracking studies, the expansion factors were revised in 1996 from 1.6 to 4.0 times the summed tributary counts on the Unuk and Chickamin rivers (Pahlke et al. 1996, Pahlke 1997a, Pahlke 1997b). The expansion factor produced an estimated escapement of 5,364 large chinook salmon to the Unuk River in 2000, an increase of 37% from 1999. The ongoing mark-recapture program estimated an escapement of 5,872 large chinook salmon (SE = 644) in 2000 (Jones and McPherson 2002). As part of that project, 867 fish were sampled for age, sex and size data (Appendix A4D, A5D). Live fish were sampled with angling gear and carcasses were collected by spear.

### CHICKAMIN RIVER

In 2000, 801 large chinook salmon were counted in index areas on eight tributaries of the Chickamin River, compared to 501 in 1999 (Table 10). Counts in 2000 were above the ten year average in 6 out of 8 Chickamin River tributaries (Table 11). The 2000 count was within the index survey escapement goal range of 450 to 900 fish; McPherson and Carlile 1997) (Figure 7). The summed counts for 2000 were multiplied by a survey expansion factor of 4.0 to produce a total escapement estimate of 3,204 fish to the system.

Angling and spears were used to collect age, sex and size data from 187 fish in 2000 (Appendix A4C, A5C).

### BLOSSOM RIVER

Two hundred and thirty-one (231) large chinook salmon were counted in index areas of the Blossom River in 2000, up from 212 fish counted in 1999 (Table 12). The 2000 count was 4% below the lower limit of the index survey goal

**Table 8.–Peak escapement counts of chinook salmon to index areas of the Unuk River, 1960–2000.**

| Year[a] | Cripple Creek | | Genes Lake Creek | | Eulachon Creek | | Clear Creek | | Lake Creek | | Kerr Creek | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | –[b] | | – | | 250 | (A) | – | | – | | – | | 250 |
| 1961 | 3 | (F) | 200 | (F) | 270 | (F) | 65 | (F) | – | | 53 | (F) | 591 |
| 1962 | – | | 150 | (A) | 145 | (A) | 100 | (A) | 30 | (A) | – | | 425 |
| 1963 | 100 | (A) | 750 | (A) | 150 | (A) | 25 | (A) | – | | – | | 1,025 |
| 1964 | – | | – | | 25 | (A) | – | | – | | – | | 25 |
| 1965 | – | | – | | – | | – | | – | | – | | 0 |
| 1966 | – | | – | | – | | – | | – | | – | | 0 |
| 1967 | – | | – | | 60 | (H) | – | | – | | – | | 60 |
| 1968 | – | | – | | 75 | (H) | – | | – | | – | | 75 |
| 1969 | – | | – | | 150 | (H) | – | | – | | – | | 150 |
| 1970 | – | | – | | – | | – | | – | | – | | 0 |
| 1971 | – | | – | | 30 | (A) | – | | – | | – | | 30 |
| 1972 | 95 | (A) | 35 | (A) | 450 | (A) | 90 | (A) | 55 | (A) | – | | 725 |
| 1973 | – | | – | | 64 | (H) | – | | – | | – | | 64 |
| 1974 | – | | – | | 68 | (H) | – | | – | | – | | 68 |
| 1975 | – | | – | | 17 | (H) | – | | – | | – | | 17 |
| 1976 | –[c] | | – | | 3 | (A) | – | | – | | – | | 3 |
| 1977 | 529[c] | (F) | 339 | (F) | 57 | (H) | 34 | (H) | | | 15 | (H) | 974 |
| 1978 | 394[c] | (F) | 374 | (F) | 218 | (H) | 85 | (H) | 20 | (H) | 15 | (H) | 1,106 |
| 1979 | 363 | (F) | 101 | (F) | 48 | (H) | 14 | (H) | 30 | (H) | 20 | (H) | 576 |
| 1980 | 748 | (F) | 122 | (F) | 95 | (H) | 28 | (H) | 5 | (H) | 18 | (H) | 1,016 |
| 1981 | 324 | (F) | 112 | (F) | 196 | (H) | 54 | (H) | 20 | (H) | 25 | (H) | 731 |
| 1982 | 538 | (F) | 329 | (F) | 384 | (H) | 24 | (H) | 48 | (H) | 28 | (H) | 1,351 |
| 1983 | 459 | (F) | 338 | (F) | 288 | (H) | 24 | (H) | 12 | (H) | 4 | (H) | 1,125 |
| 1984 | 644 | (F) | 647 | (F) | 350 | (H) | 113 | (H) | 32 | (H) | 51 | (H) | 1,837 |
| 1985 | 284 | (F) | 553 | (F) | 275 | (H) | 37 | (H) | 22 | (H) | 13 | (H) | 1,184 |
| 1986 | 532 | (F) | 838 | (F) | 486 | (H) | 183 | (F) | 25 | (H) | 62 | (H) | 2,126 |
| 1987 | 860 | (F) | 398 | (F) | 520 | (H) | 107 | (H) | 37 | (H) | 51 | (H) | 1,973 |
| 1988 | 1,068 | (F) | 154 | (F) | 146 | (F) | 292 | (H) | 60 | (H) | 26 | (H) | 1,746 |
| 1989 | 351 | (F) | 302 | (F) | 298 | (H) | 128 | (H) | 27 | (F) | 43 | (H) | 1,149 |
| 1990 | 86 | (F) | 284 | (F) | 81 | (H) | 103 | (F) | 26 | (F) | 11 | (H) | 591 |
| 1991 | 358 | (W/F) | 123 | (F) | 43 | (H) | 96 | (F) | 23 | (F) | 12 | (H) | 655[d] |
| 1992 | 327 | (W/F) | 360 | (F) | 57 | (F) | 69 | (F) | 31 | (H) | 30 | (H) | 874[d] |
| 1993 | 448 | N(F) | 330 | N(F) | 132 | E(F) | 137 | N(F) | 8 | N(F) | 13 | P(H) | 1,068 |
| 1994 | 161 | P(F) | 300 | N(F) | 52 | N(H) | 128 | E(F) | 18 | N(F) | 52 | N(F) | 711[e] |
| 1995 | 211 | N(F) | 347 | N(F) | 74 | N(H) | 66 | E(H) | 35 | E(H) | 39 | N(H) | 772 |
| 1996 | 417 | N(F) | 400 | N(F) | 79 | N(F) | 148 | E(F) | 25 | E(H) | 98 | E(F) | 1,167 |
| 1997 | 244 | P(F) | 154 | N(F/H) | 53 | N(F) | 113 | N(F) | 13 | N(H) | 59 | E(F) | 636[f] |
| 1998 | 311 | N(F) | 283 | N(F) | 39 | N(H) | 81 | N(F) | 22 | N(F) | 104 | N(F) | 840[g] |
| 1999 | 202 | N(F) | 307 | N(F) | 54 | N(H) | 67 | N(F) | 9 | N(F) | 41 | N(F) | 680[h] |
| 89–98 Average | 277 | | 289 | | 66 | | 101 | | 21 | | 46 | | 799 |
| 2000 | 450 | N(F) | 565 | N(F) | 116 | N(H) | 86 | N(H) | 56 | E(H) | 68 | N(H) | 1,341[i] |

[a] Counts prior to 1975 may not be comparable due to differences in survey dates and counting methods.

[b] — = no survey conducted or data not comparable; (F) = escapement survey conducted by walking river; (A) = escapement survey conducted from fixed-wing aircraft; (H) = escapement survey conducted from helicopter; (W/F) = weir and foot count; N = survey conditions normal; E = excellent; P = poor.

[c] Not including 35 fish for egg take in 1976; 132 in 1977; 85 in 1978.

[d] Cripple Cr. weir count reduced by /0.625 to be comparable with foot surveys.

[e] Mark-recapture estimate of escapement 4,623 (SE 1,266; Pahlke et al. 1996).

[f] Mark-recapture estimate of escapement 2,970 (SE 277; Jones et al. 1998b)

[g] Mark-recapture estimate of escapement 4,132 (SE 413; Jones and McPherson 1999).

[h] Mark-recapture estimate of escapement 3,914 (SE 490; Jones and McPherson 2000).

[i] Mark-recapture estimate of escapement 5,872 (SE 644; Jones and McPherson 2002 ).

**Table 9.–Distribution of spawning chinook salmon among index areas of the Unuk River for years when all index areas were surveyed.**

| Year | Cripple Creek | % | Genes Lake Creek | % | Eulachon Creek | % | Clear Creek | % | Lake Creek | % | Kerr Creek | % | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1978 | 394 | 36 | 374 | 34 | 218 | 20 | 85 | 8 | 20 | 2 | 15 | 1 | 1,106 |
| 1979 | 363 | 63 | 101 | 18 | 48 | 8 | 14 | 2 | 30 | 5 | 20 | 3 | 576 |
| 1980 | 748 | 74 | 122 | 12 | 95 | 9 | 28 | 3 | 5 | 0 | 18 | 2 | 1,016 |
| 1981 | 324 | 44 | 112 | 15 | 196 | 27 | 54 | 7 | 20 | 3 | 25 | 3 | 731 |
| 1982 | 538 | 40 | 329 | 24 | 384 | 28 | 24 | 2 | 48 | 4 | 28 | 2 | 1,351 |
| 1983 | 459 | 41 | 338 | 30 | 288 | 26 | 24 | 2 | 12 | 1 | 4 | 0 | 1,125 |
| 1984 | 644 | 35 | 647 | 35 | 350 | 19 | 113 | 6 | 32 | 2 | 51 | 3 | 1,837 |
| 1985 | 284 | 24 | 553 | 47 | 275 | 23 | 37 | 3 | 22 | 2 | 13 | 1 | 1,184 |
| 1986 | 532 | 25 | 838 | 39 | 486 | 23 | 183 | 9 | 25 | 1 | 62 | 3 | 2,126 |
| 1987 | 860 | 44 | 398 | 20 | 520 | 26 | 107 | 5 | 37 | 2 | 51 | 3 | 1,973 |
| 1988 | 1,068 | 61 | 154 | 9 | 146 | 8 | 292 | 17 | 60 | 3 | 26 | 1 | 1,746 |
| 1989 | 351 | 31 | 302 | 26 | 298 | 26 | 128 | 11 | 27 | 2 | 43 | 4 | 1,149 |
| 1990 | 86 | 15 | 284 | 48 | 81 | 14 | 103 | 17 | 26 | 4 | 11 | 2 | 591 |
| 1991 | 358 | 55 | 123 | 19 | 43 | 7 | 96 | 15 | 23 | 4 | 12 | 2 | 655 |
| 1992 | 327 | 37 | 360 | 41 | 57 | 7 | 69 | 8 | 31 | 4 | 30 | 3 | 874 |
| 1993 | 448 | 42 | 330 | 31 | 132 | 12 | 137 | 13 | 8 | 0 | 13 | 1 | 1,068 |
| 1994 | 161 | 23 | 300 | 42 | 52 | 7 | 128 | 18 | 18 | 3 | 52 | 7 | 711 |
| 1995 | 211 | 27 | 347 | 45 | 74 | 10 | 66 | 9 | 35 | 5 | 39 | 5 | 772 |
| 1996 | 417 | 36 | 400 | 34 | 79 | 7 | 148 | 13 | 25 | 2 | 98 | 8 | 1,167 |
| 1997 | 244 | 38 | 154 | 24 | 53 | 8 | 113 | 18 | 13 | 2 | 59 | 9 | 636 |
| 1998 | 311 | 37 | 283 | 34 | 39 | 5 | 81 | 10 | 22 | 3 | 104 | 12 | 840 |
| 1999 | 202 | 30 | 307 | 45 | 54 | 8 | 67 | 10 | 9 | 1 | 41 | 6 | 680 |
| Avg. | 424 | 39 | 325 | 31 | 180 | 15 | 95 | 9 | 25 | 2 | 37 | 4 | 1,087 |
| 2000 | 450 | 34 | 565 | 42 | 116 | 9 | 86 | 6 | 56 | 4 | 68 | 5 | 1,341 |

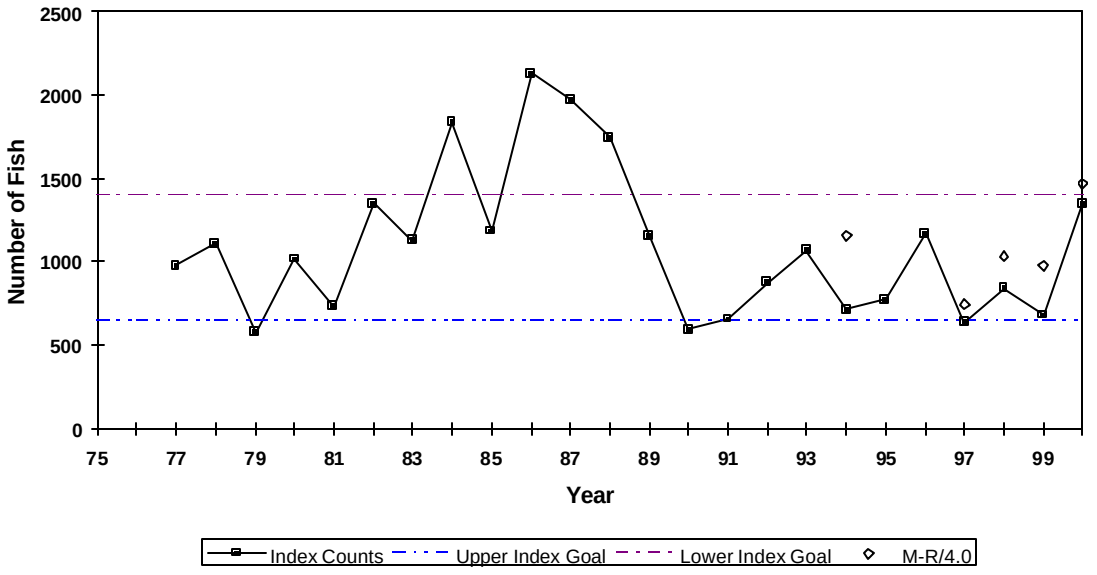


**Figure 6.–Counts of large chinook salmon in index areas of the Unuk River, 1975–2000, and mark-recapture estimates divided by expansion factor (4.0).** Lines show upper and lower limits of index escapement goal range.

**Table 10.–Counts of chinook salmon in index areas of the Chickamin River, 1960–2000**

| Year[a] | South Fork Creek | Barrier Creek | Butler Creek | Leduc Creek | Indian Creek | Humpy Creek | King Creek | Clear Falls Creek | Total[c] |
|---|---|---|---|---|---|---|---|---|---|
| 1960 | –[b] | – | – | – | – | 3 (A) | – | – | 3 |
| 1961 | – | 36 (A) | 77 (A) | 42 (A) | 5 (A) | 120 (A) | 48 (A) | – | 328 |
| 1962 | 400 (A) | 35 (A) | – | – | – | 150 (A) | – | – | 585 |
| 1963 | 350 (A) | 115 (A) | – | – | – | 3 (A) | 200 (A) | – | 668 |
| 1964 | – | – | – | – | – | – | – | – | – |
| 1965 | – | – | – | – | – | – | 75 (A) | – | 75 |
| 1966 | – | – | – | – | – | 50 (F) | – | – | 50 |
| 1967 | – | – | – | – | – | - | 45 (H) | – | 45 |
| 1968 | – | – | – | – | – | 30 (H) | 20 (H) | – | 50 |
| 1969 | – | – | – | – | – | 10 (H) | 45 (H) | – | 55 |
| 1970 | – | – | – | – | – | – | – | – | – |
| 1971 | – | – | – | – | – | – | – | – | – |
| 1972 | 350 (A) | 25 (A) | – | 85 (A) | – | 65 (A) | 510 (A) | – | 1,035 |
| 1973 | – | – | – | – | – | 14 (A) | 65 (A) | – | 79 |
| 1974 | 144 (H) | – | – | – | – | – | 11 (H) | – | 155 |
| 1975 | 141 (H) | 9 (H) | 66 (H) | 6 (H) | 90 (H) | 7 (H) | 30 (H) | – | 370 |
| 1976 | 46 (H) | 10 (H) | 15 (H) | 12 (H) | 9 (H) | – | – | – | 157 |
| 1977 | 52 (H) | 66 (H) | 30 (H) | 26 (H) | 53 (H) | 0 (H) | – | – | 363 |
| 1978 | 21 (H) | 94 (H) | 4 (H) | 42 (H) | 20 (H) | – | – | – | 308 |
| 1979 | 63 (H) | 17 (H) | 29 (H) | 0 (H) | 31 (H) | – | – | – | 239 |
| 1980 | 56 (H) | 62 (H) | 104 (H) | 17 (H) | 22 (H) | – | – | – | 445 |
| 1981 | 51 (H) | 105 (H) | 51 (H) | 25 (H) | 12 (H) | 4 (F) | 105 (F) | 31 (H) | 384 |
| 1982 | 84 (H) | 149 (H) | 37 (H) | 36 (H) | 30 (F) | 37 (F) | 165 (F) | 33 (H) | 571 |
| 1983 | 28 (H) | 138 (H) | 91 (H) | 30 (H) | 47 (H) | – | 212 (F) | 30 (H) | 599 |
| 1984 | 185 (H) | 171 (H) | 124 (H) | 15 (H) | 103 (H) | 88 (F) | 388 (F) | 28 (H) | 1,102 |
| 1985 | 163 (H) | 129 (H) | 92 (H) | 8 (H) | 125 (H) | 50 (H) | 377 (H) | 12 (H) | 956 |
| 1986 | 562 (H) | 168 (H) | 203 (H) | 20 (H) | 120 (H) | – | 564 (H) | 40 (H) | 1,745 |
| 1987 | 261 (H) | 76 (H) | 120 (H) | 19 (H) | 115 (H) | 26 (H) | 310 (H) | 48 (H) | 975 |
| 1988 | 280 (H/F) | 82 (H/F) | 159 (H) | 25 (H/F) | 32 (H) | 19 (H/F) | 164 (H) | 25 (H/F) | 786 |
| 1989 | 226 (H/F) | 90 (H) | 137 (H) | 57 (H) | 84 (H) | 22 (H/F) | 224 (H) | 94 (H) | 934 |
| 1990 | 135 (F) | 107 (H) | 27 (H) | 20 (H) | 24 (H) | 35 (H) | 163 (H) | 53 (H) | 564 |
| 1991 | 125 (H) | 18 (H) | 49 (H) | 14 (H) | 38 (H) | 13 (H) | 185 (H) | 45 (H) | 487 |
| 1992 | 87 (H) | 4 (H) | 68 (H) | 4 (H) | 20 (H) | 8 (H) | 131 (H) | 24 (H) | 346 |
| 1993 | 67 N(H) | 46 E(H) | 68 N(H) | 11 N(H) | 29 N(H) | 13 N(H) | 80 N(H) | 75 N(H) | 389 |
| 1994 | 31 N(H) | 29 E(H) | 64 E(H) | 18 E(H) | 16 N(H) | 44 N(H) | 129 E(H) | 57 E(H) | 388 |
| 1995 | 87 E(H) | 12 E(F) | 59 E(F) | 60 E(H) | 36 N(F) | 13 N(F) | 62 N(H) | 27 E(H) | 356[d] |
| 1996 | 72 N(H) | 13 N(F) | 74 E(H) | 23 E(H) | 48 N(F) | 30 N(F) | 106 E(F) | 56 E(H) | 422[d] |
| 1997 | 28 P(H) | 10 N(H) | 43 N(H) | 7 N(H) | 24 N(H) | 15 N(H) | 95 N(H) | 50 N(H) | 272 |
| 1998 | 46 N(H) | 0 N(H) | 124 E(H) | 16 P(H) | 46 N(H) | 28 N(H) | 123 N(H) | 8 P(H) | 391 |
| 1999 | 54 N(H) | 18 N(H) | 106 N(H) | 33 N(H) | 52 N(F) | 16 N(F) | 200 N(H) | 22 N(H) | 501 |
| 90-99 Avg. | 73 | 26 | 68 | 21 | 33 | 22 | 127 | 42 | 412 |
| 2000 | 109 N(H) | 27 N(H) | 230 E(H) | 61 N(H) | 63 N(H) | 20 N(H) | 251 N(H) | 40 P(H) | 801 |

[a] Escapement counts conducted prior to 1975 may not be comparable due to differences in survey dates and counting methods.

[b] — = no survey conducted or data not comparable; (A) = escapement surveyed by fixed-wing aircraft; (F) = escapement surveyed by walking stream; (H) = escapement surveyed by helicopter; (H/F) = escapement surveyed by combination of walking and helicopter; N = survey conditions normal; E = excellent.

[c] Totals for 1975–1980, 1983 and 1986 expanded for unsurveyed index areas by 1981–1992 average % observed to those indices.

[d] Mark-recapture estimates of escapement: 1995 = 2,309 large fish (SE 723); 1996 = 1,587 (SE 199).

**Table 11.–Distribution of spawning chinook salmon among index areas of the Chickamin River for years when all index areas were surveyed.**

| Year | South Fork Creek | % | Barrier Creek | % | Butler Creek | % | Leduc Creek | % | Indian Creek | % | Humpy Creek | % | King Creek | % | Clear Falls Creek | % | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1981 | 51 | 13 | 105 | 27 | 51 | 13 | 25 | 7 | 12 | 3 | 4 | 1 | 105 | 27 | 31 | 8 | 384 |
| 1982 | 84 | 15 | 149 | 26 | 37 | 6 | 36 | 6 | 30 | 5 | 37 | 6 | 165 | 29 | 33 | 6 | 571 |
| 1984 | 185 | 17 | 171 | 16 | 124 | 11 | 15 | 1 | 103 | 9 | 88 | 8 | 388 | 35 | 28 | 3 | 1,102 |
| 1985 | 136 | 14 | 156 | 16 | 93 | 10 | 8 | 0 | 125 | 13 | 50 | 5 | 377 | 39 | 12 | 1 | 957 |
| 1987 | 261 | 27 | 76 | 8 | 120 | 12 | 19 | 2 | 115 | 12 | 26 | 3 | 310 | 32 | 48 | 5 | 975 |
| 1988 | 280 | 36 | 82 | 10 | 159 | 20 | 25 | 3 | 32 | 4 | 19 | 2 | 164 | 21 | 25 | 3 | 786 |
| 1989 | 226 | 24 | 90 | 10 | 137 | 15 | 57 | 6 | 84 | 9 | 22 | 2 | 224 | 24 | 94 | 10 | 934 |
| 1990 | 135 | 24 | 107 | 19 | 27 | 5 | 20 | 4 | 24 | 4 | 35 | 6 | 163 | 29 | 53 | 9 | 564 |
| 1991 | 125 | 26 | 18 | 4 | 49 | 10 | 14 | 3 | 38 | 8 | 13 | 3 | 185 | 38 | 45 | 9 | 487 |
| 1992 | 87 | 25 | 4 | 1 | 68 | 20 | 4 | 1 | 20 | 6 | 8 | 2 | 131 | 38 | 24 | 7 | 346 |
| 1993 | 67 | 17 | 46 | 12 | 68 | 17 | 11 | 3 | 29 | 7 | 13 | 3 | 80 | 21 | 75 | 19 | 389 |
| 1994 | 31 | 8 | 29 | 7 | 64 | 16 | 18 | 5 | 16 | 4 | 44 | 11 | 129 | 33 | 57 | 15 | 388 |
| 1995 | 87 | 24 | 12 | 3 | 59 | 17 | 60 | 17 | 36 | 10 | 13 | 4 | 62 | 17 | 27 | 8 | 356 |
| 1996 | 72 | 17 | 13 | 3 | 74 | 18 | 23 | 5 | 48 | 11 | 30 | 7 | 106 | 25 | 56 | 13 | 422 |
| 1997 | 28 | 10 | 10 | 4 | 43 | 16 | 7 | 3 | 24 | 9 | 15 | 6 | 95 | 35 | 50 | 18 | 272 |
| 1998 | 46 | 12 | 0 | 0 | 124 | 32 | 16 | 4 | 46 | 12 | 28 | 7 | 123 | 31 | 8 | 2 | 391 |
| 1999 | 54 | 11 | 18 | 4 | 106 | 21 | 33 | 7 | 52 | 10 | 16 | 3 | 200 | 40 | 22 | 4 | 501 |
| Avg. | 134 | 21 | 73 | 11 | 89 | 14 | 23 | 4 | 53 | 8 | 28 | 4 | 199 | 31 | 41 | 6 | 640 |
| 2000 | 109 | 14 | 27 | 3 | 230 | 29 | 61 | 8 | 63 | 8 | 20 | 2 | 251 | 31 | 40 | 5 | 801 |


**Figure 7.–Counts of chinook salmon in index areas of the Chickamin River, 1975–2000.** Lines show upper and lower limits of index escapement goal range.

range of 250 to 500; McPherson and Carlile 1997). Counts had exceeded the goal from 1982–1989, but since 1991 they have frequently been below the escapement goal range (Figure 8). Based on results of mark-recapture and radio-tracking studies, the expansion factors for the Blossom and Keta rivers were revised in 1996 from 1.6 to 2.5 (Pahlke 1997b). The count for 2000 was multiplied by the expansion factor of 2.5 to produce a total escapement estimate of 578 fish.

Angling was used to sample age, sex and size data and 43 samples were collected in 2000 (Appendix A4B, A5B ).

### KETA RIVER

In 2000, 300 chinook salmon were counted in the Keta River, up from 276 counted in 1999 (Table 12) and within the 1996 revised index goal range of 250 to 500 large fish (McPherson and Carlile 1997). Prior to 1990, counts of chinook salmon in the Keta River increased steadily since implementation of the 1980 rebuilding program, and had exceeded the escapement goal range every year since 1981 (Figure 9). The peak count for 2000 was multiplied by a survey expansion factor of 2.5 to produce a total escapement estimate of 750 fish. A mark-recapture experiment conducted in 2000 estimated an escapement of 914 (SE = 122) large spawners (Freeman et al. *in prep*). In the course of that project 462 age, sex and size samples were collected using angling gear on live fish and spears on dead and dying fish (Appendix A4A, A5A ).

### KING SALMON RIVER

Two helicopter surveys and a foot survey were conducted on King Salmon River in 2000. The peak count during the helicopter surveys was 71 large chinook salmon while 91 were counted during the foot survey. This was less than half the 200 fish counted in 1999 but similar to the 88 fish counted in 1998. (Table 13; Figure 10). The escapement goal was revised in 1997 to a range of 120 to 240 total large fish, (McPherson and Clark, 2001). The resulting index goal range is 80-160 large fish observed. Counts exceeded the lower bound of the index goal range from 1993-1998 and the 2000 count exceeded the lower range of the escapement goal.

The peak count of 91 was multiplied by the survey expansion factor of 1.5 to produce a total escapement estimate of 137 large fish to the system. Angling gear was used to collect age, sex and size data from 39 chinook salmon in 2000 (Appendix A4G, A5G).

### SITUK RIVER

The count of all chinook salmon through the Situk River weir in 2000 was 3,092 fish. The estimate of sport harvest above the weir is 825 fish. The escapement estimate of large fish (3-5 ocean age) as determined by analysis of length and age samples was 1,888 (Table 14; Scott McPherson, ADFG, personal communication). Escapements have exceeded the escapement goal of 600 large spawners (range of 500–1,000) each year since 1984 (Figure 11). The proportion of the recreational harvest that is caught above the weir varies from year to year and is estimated by the local management biologists and from the statewide harvest survey (Howe et al. 1998). The escapement counts from the base period all exceeded the revised escapement goal, indicating the Situk chinook salmon stock was not depressed and never needed rebuilding.

Age, sex and size data was collected from 225 live fish sampled at the weir (Appendix A4K, A5K).

### CHILKAT RIVER

The 2000 escapement to the Chilkat River was estimated by mark-recapture experiment to be 2,035 large chinook salmon, the lowest estimate since the start of the mark-recapture program in 1991 (Ericksen 2000; Appendix A2). The escapement goal of 2,000 large fish has remained unchanged since Johnson et al. (1992) demonstrated that expansion factors used on the Chilkat River system were inaccurate. The escapement goal will be reviewed soon. The mark-recapture experiment also provided age, sex, and size data from 628 fish sampled with nets and spears on the spawning grounds (Appendix A4I, A5I).

**Table 12.–Counts of chinook salmon for selected rivers in Behm Canal, 1961–2000.** Survey types: F = foot, A = airplane, H = helicopter, – = no survey. Conditions: P = poor, N = normal, E = excellent.

| Year[a] | Keta River | Blossom River | Wilson River | Marten River | Grant River | Klahini River | Total |
|---|---|---|---|---|---|---|---|
| 1961 | 44 (F) | 68 (F) | – | 22 (F) | 40 (A) | - | 174 |
| 1962 | – | – | – | – | 6 (A) | 100 (A) | 106 |
| 1963 | – | 450 (A) | 375 (A) | – | 15 (A) | – | 840 |
| 1964 | – | – | – | – | – | – | – |
| 1965 | – | – | 50 (A) | 43 (H) | – | – | 93 |
| 1966 | 75 (A) | 200 (A) | 60 (A) | 10 (A) | 100 (A) | 3 (A) | 448 |
| 1967 | 86 (H) | – | 8 (H) | 7 (H) | 15 (H) | – | 116 |
| 1968 | – | – | – | – | 4 (H) | – | 4 |
| 1969 | 200 (A) | – | 10 (A) | 10 (A) | 69 (H) | 3 (H) | 292 |
| 1970 | – | 100 (H) | – | – | – | – | 100 |
| 1971 | – | | – | – | – | – | – |
| 1972 | 255 (A) | 225 (A) | 275 (A) | – | 25 (A) | 150 (A) | 930 |
| 1973 | – | – | 30 (A) | – | 38 (A) | 7 (H) | 75 |
| 1974 | 25 (H) | 166 (H) | – | – | – | – | 191 |
| 1975 | 203 (H) | 146 (H) | 7 (H) | 15 (H) | – | – | 371 |
| 1976 | 84 (H) | 68 (H) | – | – | – | – | 152 |
| 1977 | 230 (H) | 112 (H) | – | – | – | – | 342 |
| 1978 | 392 (H) | 143 (H) | – | 2 (A) | – | – | 537 |
| 1979 | 426 (H) | 54 (H) | 36 (H) | – | – | – | 516 |
| 1980 | 192 (H) | 89 (H) | – | – | – | – | 281 |
| 1981 | 329 (H) | 159 (H) | 76 (F) | – | 25 (H) | 42 (F) | 631 |
| 1982 | 754 (H) | 345 (H) | 300 (B) | 75 (F) | 33 (F) | 79 (F) | 1,586 |
| 1983 | 822 (H) | 589 (H) | 178 (B) | 138 (B) | 8 (A) | 10 (H) | 1,745 |
| 1984 | 610 (H) | 508 (H) | 133 (F) | 12 (B) | 124 (F) | 54 (F) | 1,441 |
| 1985 | 624 (H) | 709 (H) | 420 (H) | 69 (F) | 55 (F) | 20 (F) | 1,897 |
| 1986 | 690 (H) | 1,278 (H) | – | – | – | – | 1,968 |
| 1987 | 768 (H) | 1,349 (H) | – | 270 (H) | 33 (A) | | 2,420 |
| 1988 | 575 (H) | 384 (H) | – | 543 (H) | – | 40 (H) | 1,542 |
| 1989 | 1,155 (H) | 344 (H) | – | 133 (H) | – | – | 1,632 |
| 1990 | 606 (H) | 257 (H) | – | 283 (H) | – | – | 1,146 |
| 1991 | 272 N(H) | 239 N(H) | – | 135 N(H) | – | – | 646 |
| 1992 | 217 N(H) | 150 N(H) | 109 E(H) | 76 (H) | 25 N(H) | 19 (H) | 596 |
| 1993 | 362 E(H) | 303 N(H) | 63 P(H) | 229 E(H) | – | – | 957 |
| 1994 | 306 E(H) | 161 N(H) | – | 178 E(H) | – | – | 645 |
| 1995 | 175 E(H) | 217 N(H) | 58 N(H) | 171 E(H) | – | – | 621 |
| 1996 | 297 N(H) | 220 E(H) | 23 P(H) | 62 N(H) | – | – | 602 |
| 1997 | 246 N(H) | 132 N(H) | 16 N(H) | 56 N(H) | 9 N(H) | – | 459 |
| 1998 | 180 N(H) | 91 N(H) | – | – | – | – | 271 |
| 1999 | 276 E(H) | 212 N(H) | _ | _ | _ | _ | 488 |
| 1990-99 Avg. | 294 | 198 | 54 | 149 | 17 | 19 | 643 |
| 2000 | 300 N(H) | 231 N(H) | _ | _ | _ | _ | 531 |

[a] Escapement counts prior to 1975 may not be comparable due to differences in survey dates or methods.

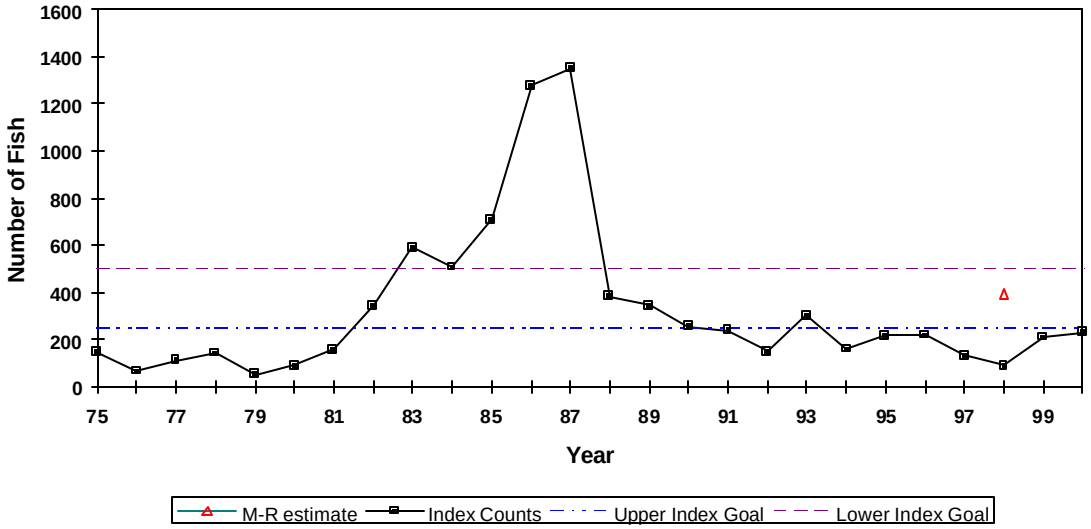


**Figure 8.–Counts of chinook salmon into the Blossom River, 1975–2000.** Lines show upper and lower limits of index escapement goal range.

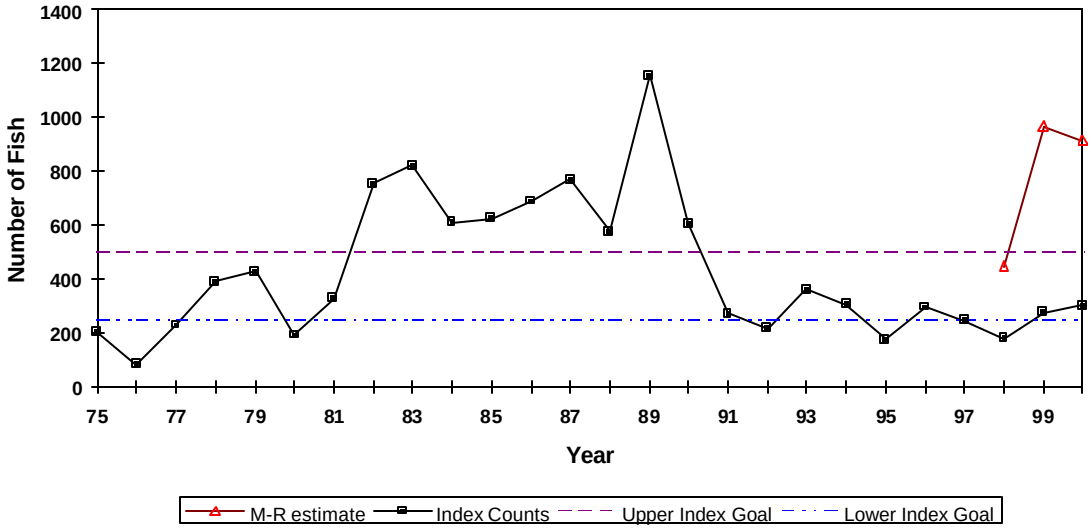


**Figure 9.–Counts of chinook salmon to the Keta River, 1975–2000 and mark-recapture estimates for 1998-2000.** Lines show upper and lower limits of index escapement goal range.

**Table 13.–Peak escapement counts and weir counts of spawning chinook salmon in the King Salmon River, 1957–2000.**

| Year | Survey count: Below weir | Survey count: Above weir | Survey as percent of weir count | Total egg take (adults) | Total weir count (adults) | Total weir count (jacks)[b] | Adults below weir (foot ct) | Total inriver (adults) | Total natural spawning |
|---|---|---|---|---|---|---|---|---|---|
| | A | B | B/(D-C) | C | D | E | F | D+F | D+F-C |
| 1957 | –[a] | 200 (F) | – | – | – | – | – | – | |
| 1960 | – | 20 (F) | – | – | – | – | – | – | |
| 1961 | – | 117 (F) | – | – | – | – | – | – | |
| 1971 | – | 94 (F) | – | – | – | – | – | – | |
| 1972 | – | 90 (F) | – | – | – | – | – | – | |
| 1973 | – | 211 (F) | – | – | – | – | – | – | |
| 1974 | – | 104 (F) | – | – | – | – | – | – | |
| 1975 | – | 42 (H) | – | – | – | – | – | – | |
| 1976 | – | 65 (H) | – | – | – | – | – | – | |
| 1977 | – | 134 (H) | – | – | – | – | – | – | |
| 1978 | – | 57 (H) | – | – | – | – | – | – | |
| 1979 | – | 88 (H) | – | 17 | – | – | – | – | |
| 1980 | – | 70 (H) | – | – | – | – | – | – | |
| 1981 | – | 101 (H) | – | 11 | – | – | – | 101 | 90 |
| 1982 | – | 259 (H) | – | 30 | – | – | – | 259 | 229 |
| 1983 | 25 | 183 (H) | 85% | 37 | 252 | 20 | 30 | 282 | 245[c] |
| 1984 | 14 | 184 (H) | 71% | 46 | 299 | 82 | 12 | 311 | 265[c] |
| 1985 | 12 | 105 (H) | 64% | 29 | 194 | 45 | 10 | 204 | 175[c] |
| 1986 | 9 | 190 (H) | 80% | 26 | 264 | 72 | 17 | 281 | 255[c] |
| 1987 | 19 | 128 (H) | 73% | 31 | 207 | 62 | 20 | 227 | 196[c] |
| 1988 | 5 | 94 (H) | 50%[d] | 35 | 231 | 54 | 12 | 243 | 208[c] |
| 1989 | 34 | 133 (H) | 63% | 38[e] | 249 | 71 | 29 | 278 | 240[c] |
| 1990 | 34 | 98 (H) | 57% | 29 | 190 | 32 | 8 | 198 | 179[c] |
| 1991 | 6 | 91 (H) | 72% | 20 | 146 | 89 | 8 | 154 | 134[c] |
| 1992 | – | 58 (H) | 59%[f] | 18 | 47 | 16 | 70 | 117 | 99[c] |
| 1993 | – | 175 E(H) | ----------no weir or egg take---------- | | | | | | |
| 1994 | – | 140 N(F) | ----------no weir or egg take---------- | | | | | | |
| 1995 | – | 97 P(H) | ----------no weir or egg take---------- | | | | | | |
| 1996 | – | 192 E(F) | ----------no weir or egg take---------- | | | | | | |
| 1997 | | 238 N(F) | ----------no weir or egg take---------- | | | | | | |
| 1998 | | 88 E(F) | ----------no weir or egg take---------- | | | | | | |
| 1999 | | 200 E(F) | ----------no weir or egg take---------- | | | | | | |
| 1983–92 Avg. | 17 | 126 | 67% | 31 | 209 | 56 | 22 | 231 | 188 |
| 2000 | | 91 N(F) | ----------no weir or egg take---------- | | | | | | |

[a] — = no survey conducted or data not comparable; (F) = escapement surveyed by walking stream; (H) = escapement surveyed from helicopter; N = survey conditions normal; E = excellent; P = poor.

[b] Minimum count as jacks could pass through weir.

[c] Natural spawning (adults) = (total inriver - egg take; 1983-1992).

[d] Four females and two males were held but not spawned for egg take; % = 94/(231-37-6) = 50%.

[e] Includes holding mortality of 4 males and 6 females for egg take.

[f] Peak survey was after weir was removed 58/99 = 59%.

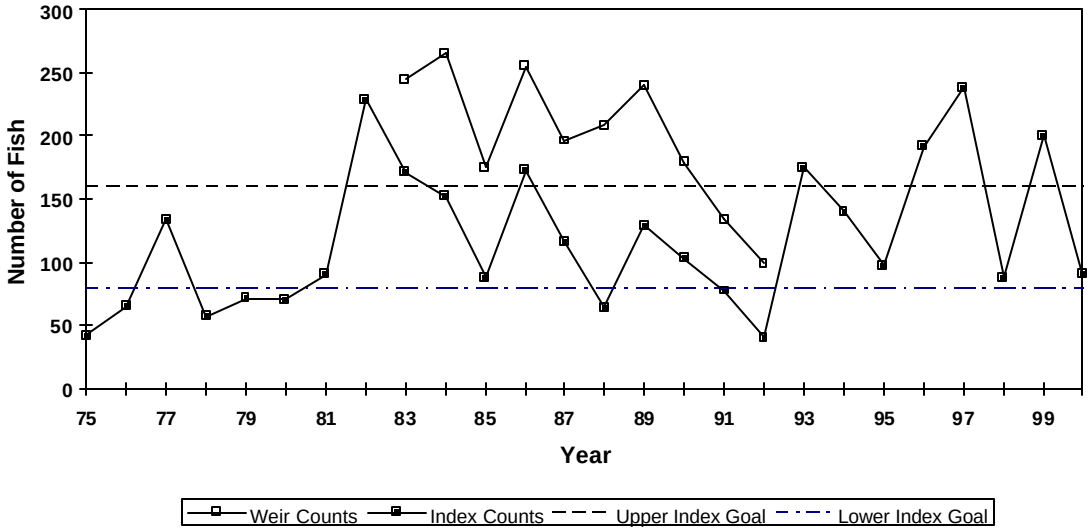


**Figure 10.–Counts of chinook salmon at a weir and in survey counts in the index area of the King Salmon River, 1975-2000.** Lines show upper and lower limits of index escapement goal range.

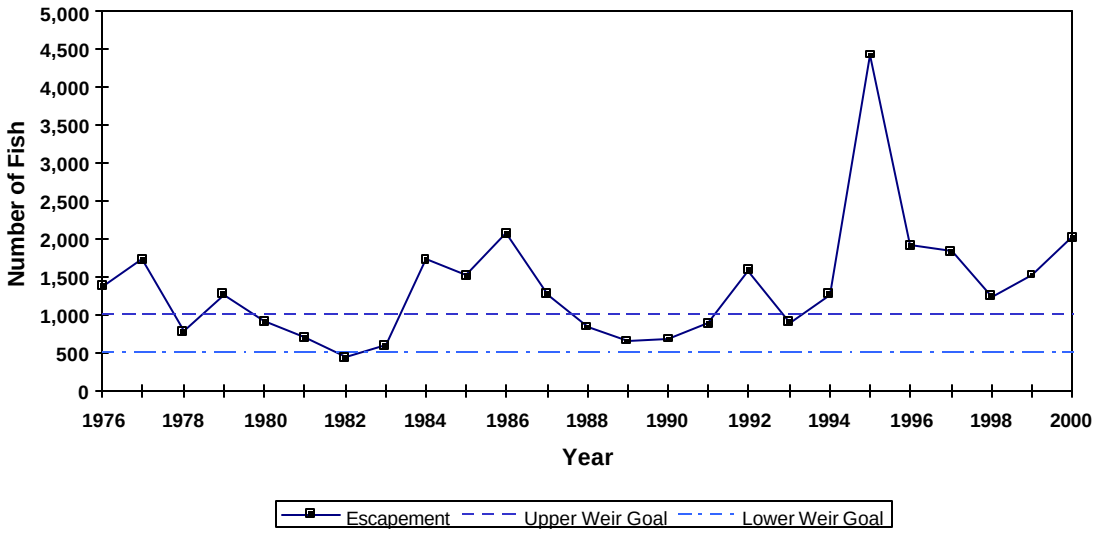


**Figure 11.–Counts of large chinook salmon at the Situk River weir, 1975–2000.** Lines show upper and lower limits of escapement goal range.

**Table 14.–Harvest, escapement, and minimum total run of Situk River chinook salmon, 1976–2000.**

| Year | Harvests below weir | | | | Abundance above weir | | | | | | Estimated total run inriver[a] | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 182-70 gillnet | Subsis-tence | Sport | Total | Total weir count | Harvest above weir | Estimated escapement[d] | | | | | | | |
| | | | | | | | Large | Medium | Small[c] | Total | Large | Medium | Small | Total |
| 1976 | 1,002 | 41 | 200 | 1,243 | 1,941 | 0 | 1,365 | 576 | | 1,941 | | | | 3,184 |
| 1977 | 833 | 24 | 244 | 1,101 | 1,880 | 0 | 1,732 | 148 | | 1,880 | | | | 2,981 |
| 1978 | 382 | 50 | 210 | 642 | 1,103 | 0 | 776 | 327 | | 1,103 | | | | 1,745 |
| 1979 | 1,028 | 25 | 282 | 1,335 | 1,800 | 0 | 1,266 | 534 | | 1,800 | | | | 3,135 |
| 1980 | 969 | 57 | 233 | 1,259 | 1,125 | 0 | 905 | 220 | | 1,125 | | | | 2,384 |
| 1981 | 858 | 62 | 130 | 1,050 | 807 | 0 | 702 | 105 | | 807 | 1,270 | 543 | 44 | 1,857 |
| 1982 | 248 | 27 | 63 | 338 | 611 | 0 | 434 | 177 | | 611 | 672 | 261 | 16 | 949 |
| 1983 | 349 | 50 | 52 | 451 | 849 | 0 | 592 | 257 | | 849 | 866 | 406 | 28 | 1,300 |
| 1984 | 512 | 89 | 151 | 752 | 2,201 | 0 | 1,726 | 475 | | 2,201 | 2,427 | 521 | 5 | 2,953 |
| 1985 | 484 | 156 | 511 | 1,151 | 1,982 | 0 | 1,521 | 461 | | 1,982 | 2,233 | 683 | 217 | 3,133 |
| 1986 | 202 | 99 | 37 | 338 | 2,572 | 0 | 2,067 | 505 | | 2,572 | 2,290 | 583 | 37 | 2,910 |
| 1987 | 891 | 24 | 395 | 1,310 | 1,799 | 0 | 1,265 | 534 | | 1,799 | 2,215 | 575 | 319 | 3,109 |
| 1988 | 299 | 90 | 132 | 521 | 1,078 | 56 | 837 | 185 | | 1,022 | 1,337 | 259 | 3 | 1,599 |
| 1989 | 1 | 496[b] | 0 | 497 | 1,871 | 0 | 653 | 122 | 1,096 | 1,871 | 1,073 | 198 | 1,096 | 2,367 |
| 1990 | 0 | 516[b] | 0 | 516 | 1,363 | 0 | 676 | 532 | 155 | 1,363 | 969 | 755 | 155 | 1,879 |
| 1991 | 786 | 220[b] | 67 | 1,073 | 1,613 | 29 | 878 | 125 | 582 | 1,585 | 1,678 | 413 | 595 | 2,686 |
| 1992 | 1,504 | 341 | 127 | 1,972 | 1,985 | 54 | 1,579 | 224 | 128 | 1,931 | 3,103 | 699 | 155 | 3,957 |
| 1993 | 790 | 202 | 50 | 1,042 | 4,200 | 202 | 899 | 461 | 2,638 | 3,998 | 1,718 | 753 | 2,772 | 5,243 |
| 1994 | 2,656 | 367 | 397 | 3,420 | 4,416 | 170 | 1,263 | 1,399 | 1,584 | 4,246 | 3,040 | 3,161 | 1,764 | 7,965 |
| 1995 | 8,106 | 528 | 1,180 | 9,814 | 8,231 | 506 | 4,398 | 497 | 2,830 | 7,725 | 13,439 | 1,608 | 3,131 | 18,177 |
| 1996 | 3,717 | 478 | 1,270 | 5,465 | 4,151 | 795 | 1,803 | 522 | 1,031 | 3,356 | 6,521 | 1,509 | 1,678 | 9,708 |
| 1997 | 2,339 | 352 | 802 | 3,493 | 5,001 | 1,168 | 1,950 | 382 | 1,501 | 3,834 | 5,424 | 1,266 | 1,923 | 8,612 |
| 1998 | 2,101 | 594 | 494 | 3,189 | 5,329 | 857 | 1,072 | 716 | 2,683 | 4,472 | 3,340 | 1,924 | 3,308 | 8,572 |
| 1999 | 3,810 | 510 | 605 | 4,925 | 2,786 | 740 | 1,523 | 227 | 296 | 2,046 | 5,453 | 1,614 | 644 | 7,711 |
| 90-99 | 2,581 | 411 | 499 | 3,491 | 3,908 | 452 | 1,624 | 488 | 1,343 | 3,456 | 4,450 | 1,337 | 1,612 | 7,399 |
| 2000 | 1,318 | 594 | 352 | 2,237 | 3,092 | 825 | 1,888 | 87 | 293 | 2,267 | 4,481 | 392 | 455 | 5,328 |

[a] Total run inriver = chinook escapement + Situk commercial, sport, and subsistence harvests. An unknown portion of the Yakutat Bay catch is Situk fish. Large chinook are 3 to 5-ocean-age and small are 1 and 2-ocean age. Commercial and subsistence catches include some small chinook (Scott McPherson, unpublished report).

[b] Non-retention regulation in effect for commercial fisheries in 1989 and 1990; estimated personal use harvest of 400 large chinook in 1990, 415 in 1990, and 109 in 1991.

[c] Small chinook escapement includes 1- and 2-ocean jacks from 1990 to 1996; 1-ocean fish not counted before 1990.

[d] Escapement from Scott McPherson, Alaska Department of Fish and Game, Douglas, personal communication, based on age composition.

## OTHER SYSTEMS

Counts of chinook salmon in the Marten and Wilson Rivers are not included in the regional index program, and no official escapement goals have been set for these systems. However, regular counts have been made in the Marten River since 1982 because of its proximity to other surveyed systems. In 2000, efforts were concentrated on the Blossom and Keta Rivers and no chinook salmon surveys were conducted on the Marten or Wilson rivers.

Grant and Klahini rivers, small chinook systems in Behm Canal which have been surveyed sporadically, were not surveyed in 2000 (Table 12). Since 1995 surveys occasional surveys have been flown on the Harding River and Aaron Creek to determine the feasibility of adding these medium and small systems to the

program (Table 6). The remaining systems are too remote, and funds are not currently available for these surveys.

### OBSERVER TRAINING

An alternate observer accompanied the primary observer on training flights to eleven index areas in 2000 (Table 15). The same alternate observer also conducted two calibration surveys in 2000. The median proportion of the alternates' counts versus the primary observer's counts on the training flights was 80.8% (average 90%) and 83.5% on the calibration surveys.

## DISCUSSION

The utility of the index method as a measure of escapement is based on the assumption that the number of fish counted in an index area is a constant proportion of the escapement in the index area or watershed. Therefore, a change in the escapement is assumed to cause a proportional change in the index count. Consequently, if this assumption holds, even though index counts are not estimates of total escapement, multi-year trends in escapement are correct. Two types of error affect the accuracy of the survey counts.

First, factors intrinsic to each area interfere with the ability to count fish. Examples include heavily shaded areas or topography that prevent close approach with a helicopter, presence of other species that could be confused with chinook salmon, and overhanging brush, or deep or occluded water. Also, not all spawning areas in a tributary or drainage are surveyed. These factors are accounted for by survey expansion factors.

Second, factors that affect counting efficiency may vary greatly from year to year and survey to survey. These include annual changes in migratory timing; large changes in abundance that may cause reduced counts relative to the number of fish in the index area; changes in the distribution of spawners among the tributaries of a watershed among years; and inclement weather, turbidity events, or changes in pilot and/or observer experience.

Weather, logistics, run timing, etc., can make it difficult for a single surveyor to complete all the index surveys annually under good or excellent conditions. Thus, alternate surveyors are selected to conduct the counts when the primary surveyor can not. Also, new surveyors take on primary responsibilities at infrequent intervals. Since between observer variability and bias can be significant (Jones et al. 1998), new surveyors must be trained and calibrated against the primary surveyor to provide consistency and continuity in the data.

Estimates of total escapement (direct estimates or expanded counts) are needed when comparing escapements among watersheds or for estimating exploitation rates and spawner/recruit relationships. Though survey and tributary expansion factors have been endorsed by the Pacific Salmon Commission (PSC) since 1981, the original expansion factors were developed on the basis of judgment rather than on empirical data (Appendix B *in* Pahlke 1997b), and error associated with these expansions can be large. Johnson et al. (1992) showed that expansion factors for the Chilkat River, for example, greatly underestimated escapement to that watershed. ADF&G recognized the need to develop better expansions throughout the region, and has independently estimated distribution and escapement for chinook salmon in the Unuk (Pahlke et al. 1996; Jones and McPherson 1999; 2000), Chickamin (Pahlke 1996; 1997a), Stikine (Pahlke and Etherton 1999a; Bernard et al. 2000), Taku (Pahlke and Bernard 1996, McPherson et al. 1997, 2001), Keta (Brownlee et al. 1999) and Alsek rivers (Pahlke et al. 1999). Total escapement projects are continuing on many of those rivers.

On the basis of information collected on the Unuk and Chickamin rivers, expansion factors for the four Behm Canal systems were revised in 1996. The expansion factor for the King Salmon River was based on 10 years of weir counts compared with aerial surveys, and the expansion factor for Andrew Creek was based on 4 years of paired weir and survey counts.

**Table 15.–Observer training and calibration flights conducted in 2000.**

| Index area | Date | Visibility | Primary[a] observer | Alternate[a] observer | P - A | A/P percent | Comments |
|---|---|---|---|---|---|---|---|
| Nahlin IA1 | 7/30 | poor | 46 | 39 | 7 | 84.8 | frontseat training flight[b] |
| Nahlin IA2 | 7/30 | poor | 315 | 307 | 8 | 97.5 | frontseat training flight |
| Nahlin IA3 | 7/30 | normal | 367 | 283 | 84 | 77.1 | frontseat training flight |
| Nakina IA1 | 7/30 | normal | 1,207 | 890 | 317 | 73.7 | backseat training flight |
| Nakina IA2 | 7/30 | normal | 420 | 310 | 110 | 73.8 | backseat training flight |
| Nakina IA3 | 7/30 | normal | 730 | 590 | 140 | 80.8 | backseat training flight |
| Nakina IA4 | 7/30 | poor | 77 | 130 | -53 | 168.8 | backseat training flight |
| Little Tahltan | 7/30 | poor | 2,557 | 2,270 | 287 | 88.8 | backseat training flight |
| Dudidontu R. | 7/31 | normal | 433 | 344 | 89 | 79.4 | backseat training flight |
| Blanchard | 8/1 | normal | 163 | 168 | -5 | 103.1 | backseat training flight |
| Takhanne | 8/1 | normal | 152 | 102 | 50 | 67.1 | backseat training flight |
| | | | | | Average | 90.4 | |
| | | | | | Median | 80.8 | |
| Tseta Creek | 7/30 | normal | 130 | 113 | 17 | 86.9 | calibration survey |
| Tatsamenie | 8/21 | normal | 953 | | | | |
| Tatsamenie | 8/25 | normal | | 763 | 190 | 80.1 | calibration survey, 4 days later |
| | | | | | Average and median | 83.5 | |

[a] P: primary observer, KAP, A: alternate, JAD.

[b] FSTF = alternate observer sits in front (preferred) seat; BSTF = alternate observer sits in back seat

The expansion factor for the Taku River was revised in 1999 after 5 years of mark-recapture data (McPherson et al. 2000). The expansion factor for the Alsek River was revised in 2000 based on 2 years of mark-recapture studies.

Changing the escapement goals, however, requires a formal review by ADF&G and the Chinook Technical Committee of the PSC, as was done for the Situk River in 1991, the Behm Canal systems in 1994, and King Salmon River in 1997. The Andrew Creek escapement goal was also revised in 1998 to a range of 650 to 1,500 total large spawners (Clark et al. 1998). The Canadian Department of Fisheries and Oceans and the Transboundary Technical Committee are included in any review of Taku, Stikine or Alsek River goals. In 1998, a revised stock-recruitment analysis by ADF&G and DFO staff estimated that the escapement goal for the Klukshu River should range between 1,100 and 2,300 spawners (McPherson et al. 1998b). Escapement goals for the Taku and Stikine rivers were approved in 1999 (McPherson et al. 2000; Bernard et al. 2000).

Expansion factors and escapement goals will continue to be revised as we complete more studies which include both index counts and estimates of total escapement. Any change in survey methods or observers must take into account the comparability of historical data with new data. Year-to-year consistency and repeat-ability of index counts may be more important than their absolute accuracy to agencies that compare escapement estimates between years.

Currently, only one of the 22 minor producers in the region and six of nine medium (seven

with Chilkat) producing watersheds are included in the index survey program. Prior to 1997, counts from these streams were expanded to represent the escapement of all streams in minor and medium producing categories. The King Salmon River is unique among Southeast Alaska chinook populations as the only island system, and using it to represent the other 21 small systems most likely produced inaccurate estimates of total escapement. However, because escapement to small and medium systems are a small proportion of the total region escapement, errors in those estimates would have little effect on estimates of regional escapement. In 1997, the method used to expand the index counts to a total region escapement estimate was revised based on over 20 years of systematic escapement surveys in Southeast Alaska and the transboundary rivers. The revised method assumes the sum of the expanded indices accounts for approximately 90% of the total escapement and that number is expanded to account for the remaining 10%. We think this method more accurately reflects the geographic distribution of the unsurveyed systems.

Observer training and calibration flights conducted in 2000 indicated a fairly consistent undercounting by the alternate observer when compared with the primary observers counts. These flights will be continued in the future and reanalyzed as more calibration surveys are completed.

Escapement goal revisions based on spawner-recruit analysis require a long time series of age and sex composition data along with total escapement estimates. Age, sex, and length composition estimates for all sampled chinook stocks in Southeast Alaska and transboundary rivers are presented in Appendix tables A4-A5. An interesting trend was apparent in 1999, with the largest fish occurring in the southern systems and average size decreasing towards the north. In 2000, the largest fish were again seen in the southern systems, but the fish in the northern systems: Chilkat, Alsek and Situk rivers were larger than chinook salmon in the central systems. Many (up to 75%) of the 2-ocean fish sampled on the Blossom, Keta and Chickamin rivers were of legal size (28" total length), which is uncommon in other systems. When mean lengths at age were tested for differences, lengths from the Keta, Blossom and Chickamin rivers were not different from each other but were statistically larger than those of other systems in almost every case (Appendix A6).

The age-.2 (2-ocean-age jack) component was relatively strong which indicates high survival rates for the 1996 brood year. The 3-ocean-age (1995 brood) class was dominant in all systems in 2000, while age-.4 fish comprised a lower percentage in most systems, compared to 1999. We therefore expect to see an increase in abundance in 2001 for many stocks, compared to 2000.

Sampling strategies were designed to make he estimated age and sex distributions relatively unbiased for age-.2 to age-.5 fish. A weir was used to sample the Situk River; stratified mark-recapture studies were used on the Alsek, Chilkat, Taku, Stikine, Unuk and Keta Rivers; and non-selective rod and reel and/or carcass sampling was used on the Blossom, Chickamin, Andrew Creek and King Salmon systems. Therefore, comparisons of length or age compositions between stocks within the age-.2. to age-.5 should be relatively unbiased for stocks with adequate sample sizes. The Situk River is the only chinook system in Southeast Alaska where the escapement of age-.1 jacks are estimated annually. The mean length at age data is unbiased for all stocks.

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# APPENDIX A

**Appendix A1.–Survey escapement goals and system goals for large chinook salmon, Southeast Alaska and transboundary rivers, as accepted by ADF&G, DFO, CTC and TTC, 2000.**

| | | Index survey goal[a] | | | System goal[b] | | |
|---|---|---|---|---|---|---|---|
| | | | Range | | | Range | |
| River | Index areas | Point est. | Lower | Upper | Point est. | Lower | Upper |
| **Alsek**[c] | Klukshu | | 1,100 | 2,300 | | | |
| **Taku**[d] | 5 tributaries | 7,000 | 5,800 | 10,600 | 36,000 | 30,000 | 55,000 |
| **Stikine**[e] | Little Tahltan | 3,300 | 2,700 | 5,300 | 17,368 | 14,000 | 28,000 |
| **Situk**[f] | All | | | | 600 | 500 | 1,000 |
| **Chilkat** | All | | | | 2,000 | under review | |
| **Andrew Cr.**[g] | All | 425 | 325 | 750 | 850 | 650 | 1,500 |
| **Unuk**[n] | 6 tributaries | 800 | 650 | 1,400 | | | |
| **Chickamin**[n] | 8 tributaries | 525 | 450 | 900 | | | |
| **Blossom**[n] | All | 300 | 250 | 500 | | | |
| **Keta**[n] | All | 300 | 250 | 500 | | | |
| **King Salmon R.**[i] | All | 100 | 80 | 160 | 150 | 120 | 240 |

[a] Index survey goal corresponds to the peak or highest single day count of large spawners in annual survey counts.

[b] System goal corresponds to the estimated total escapement of large spawners in the river system, estimated from mark-recapture studies, weir counts or expanded survey counts.

[c] McPherson et al. 1998.

[d] McPherson et al. 2000.

[e] Bernard et al. 2000.

[f] McPherson 1991.

[g] Clark et al. 1998.

[h] McPherson and Carlile, 1997.

[I] McPherson and Clark, 2001.

**Appendix A2.–Estimated total escapements of chinook salmon to escapement indicator systems and to Southeast Alaska and transboundary rivers, 1975–2000.** Numbers may be revised annually as data are collected. Index escapements are expanded for survey counting rates and unsurveyed tributaries, numbers in **bold type** are weir counts or mark-recapture estimates and are not expanded, [region total expanded for 84% w/o Chilkat River, 90% with Chilkat escapement included].

| | MAJOR SYSTEMS | | | | MEDIUM SYSTEMS | | | | | | | | | Total | **Expanded** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Alsek | Taku | Stikine | Major subt. | Situk | Chilkat | Andrew | Unuk | Chick-amin | Blos-som | Keta | Med subt. | King Salmon | all systems | **region total** |
| 1975 | | 12,920 | 7,571 | | | | 520 | | 1,481 | 365 | 508 | | 62 | | |
| 1976 | 4,898 | 24,582 | 5,723 | 35,203 | **1,365** | | **404** | | 627 | 170 | 210 | | 96 | | |
| 1977 | 12,130 | 29,496 | 11,445 | 53,071 | **1,732** | | **456** | 3,896 | 1,450 | 280 | 575 | 8,389 | 199 | 61,659 | 73,404 |
| 1978 | 11,458 | 17,124 | 6,835 | 35,417 | **776** | | **388** | 4,424 | 1,234 | 358 | 980 | 8,159 | 84 | 43,660 | 51,976 |
| 1979 | 16,316 | 21,617 | 12,610 | 50,543 | **1,266** | | **327** | 2,304 | 954 | 135 | 1,065 | 6,051 | 113 | 56,707 | 67,508 |
| 77-79 Ave. | 13,301 | 22,746 | 10,297 | 46,344 | 1,258 | | 390 | 3,541 | 1,213 | 258 | 873 | 7,533 | 132 | 54,009 | 64,296 |
| 1980 | 10,398 | 39,239 | 30,573 | 80,210 | **905** | | **282** | 4,064 | 1,779 | 223 | 480 | 7,732 | 104 | 88,046 | 104,817 |
| 1981 | 8,302 | 49,559 | 36,057 | 93,918 | **702** | | **536** | 2,924 | 1,536 | 398 | 823 | 6,918 | 139 | 100,975 | 120,208 |
| 1982 | 9,076 | 23,847 | 40,488 | 73,411 | **434** | | **672** | 5,404 | 2,284 | 863 | 1,885 | 11,542 | **354** | 85,307 | 101,555 |
| 1983 | 9,848 | 9,795 | 6,424 | 26,067 | **592** | | **366** | 4,500 | 2,398 | 1,473 | 2,055 | 11,383 | **245** | 37,695 | 44,875 |
| 1984 | 6,588 | 20,778 | 13,995 | 41,361 | **1,726** | | **389** | 7,348 | 4,408 | 1,270 | 1,525 | 16,666 | **265** | 58,292 | 69,395 |
| 1985 | 5,657 | 35,916 | 16,037 | 57,610 | **1,521** | | 640 | 4,736 | 3,824 | 1,773 | 1,560 | 14,054 | **175** | 71,839 | 85,522 |
| 1986 | 10,734 | 38,110 | 14,889 | 63,733 | **2,067** | | 1,414 | 8,504 | 6,980 | 3,195 | 1,725 | 23,885 | **255** | 87,873 | 104,611 |
| 1987 | 10,339 | 28,935 | 24,632 | 63,906 | **1,265** | | 1,576 | 7,892 | 3,900 | 3,373 | 1,920 | 19,926 | **196** | 84,028 | 100,033 |
| 1988 | 8,105 | 44,524 | 37,554 | 90,183 | **837** | | 1,128 | 6,984 | 3,144 | 960 | 1,438 | 14,491 | **208** | 104,882 | 124,859 |
| 1989 | 9,570 | **40,329** | 24,282 | 74,181 | **653** | | 1,060 | 4,596 | 3,736 | 860 | 2,888 | 13,793 | **240** | 88,214 | 105,016 |
| Avg. | 8,862 | 33,103 | 24,493 | 66,458 | 1,070 | | 806 | 5,695 | 3,399 | 1,439 | 1,630 | 14,039 | 218 | 80,715 | 96,089 |
| 1990 | 7,443 | **52,142** | 22,619 | 82,204 | **676** | | 1,328 | 2,364 | 2,256 | 643 | 1,515 | 8,781 | **179** | 91,164 | 108,529 |
| 1991 | 9,690 | 51,645 | 23,206 | 84,541 | **878** | **5,897** | 800 | 2,620 | 1,948 | 598 | 680 | 13,421 | **134** | 98,096 | 108,995 |
| 1992 | 5,344 | 55,889 | 34,129 | 95,362 | **1,579** | **5,284** | 1,556 | 3,496 | 1,384 | 375 | 543 | 14,217 | **99** | 109,678 | 121,864 |
| 1993 | 13,130 | 66,125 | 58,962 | 138,217 | **899** | **4,472** | 2,120 | 4,272 | 1,556 | 758 | 905 | 14,982 | 259 | 153,458 | 170,508 |
| 1994 | 14,801 | 48,368 | 33,094 | 96,263 | **1,263** | **6,795** | 1,144 | **4,623** | 1,552 | 403 | 765 | 16,545 | 207 | 113,015 | 125,572 |
| 1995 | 22,431 | **33,805** | 16,784 | 73,020 | **4,398** | **3,790** | 686 | 3,088 | **2,309** | 543 | 438 | 15,251 | 144 | 88,415 | 98,239 |
| 1996 | 14,179 | **79,019** | **28,949** | 122,147 | **1,803** | **4,920** | 670 | 4,668 | **1,587** | 550 | 743 | 14,941 | 288 | 137,376 | 152,640 |
| 1997 | 11,796 | **114,938** | **26,996** | 153,730 | **1,950** | **8,100** | 586 | **2,970** | 1,088 | 330 | 615 | 15,639 | 357 | 169,726 | 188,584 |
| 1998 | **4,621** | 31,039 | **25,968** | 61,628 | **1,072** | **3,675** | 974 | **4,132** | 1,564 | **393** | **446** | 12,256 | 132 | 74,016 | 82,240 |
| 1999 | **11,597** | 20,545 | **19,947** | 52,089 | **1,523** | **2,271** | 1,210 | **3,914** | 2,004 | 530 | **968** | 12,420 | 300 | 64,809 | 72,010 |
| Avg. | 11,503 | 55,352 | 29,065 | 95,920 | 1,604 | 5,023 | 1,107 | 3,615 | 1,725 | 512 | 762 | 13,845 | 210 | 109,772 | 122,918 |
| 2000 | 5,440 | 30,014 | 34,196 | 69,650 | **1,888** | **2,035** | 1,380 | 5,364 | 3,204 | 578 | 750 | 15,199 | 137 | 84,986 | 94,429 |
| CHANGE FROM 1999 to 2000 | | | | | | | | | | | | | | | |
| Number | (3,305) | 9,469 | 14,249 | 20,413 | 365 | (349) | 76 | 1,450 | 1,200 | 48 | (218) | 2,610 | (163) | 23,029 | 25,588 |
| Percent | -53 | 46 | 71 | 41 | 24 | -15 | 6 | 37 | 60 | 9 | -23 | 21 | -54 | 37 | 31 |
| Goals | | | | | | Under review | | | | | | | | | |
| Lower | 4,400 | 30,000 | 14,000 | 49,400 | 500 | | 650 | 2,600 | 1,800 | 625 | 625 | 8,800 | 120 | 57,320 | 64,800 |
| Point | 6,800 | 36,000 | 17,500 | 60,300 | 600 | 2,000 | 850 | 3,500 | 2,100 | 750 | 750 | 10,450 | 150 | 71,000 | 78,889 |
| Upper | 9,200 | 55,000 | 28,000 | 92,200 | 1000 | | 1,500 | 5,600 | 3,600 | 1,250 | 1,250 | 16,200 | 240 | 108,640 | 120,711 |
| Average percent of goal | | | | | | | | | | | | | | | |
| 77-79 | 196 | 63 | 59 | 77 | 210 | | 52 | 101 | 58 | 34 | 116 | 72 | 88 | 76 | |
| 80-89 | 130 | 92 | 140 | 110 | 178 | | 108 | 163 | 162 | 192 | 217 | 134 | 145 | 114 | |
| 90-98 | 170 | 164 | 172 | 167 | 267 | 264 | 146 | 102 | 81 | 68 | 99 | 133 | 133 | 155 | |

**Appendix A3.–Detailed 2000 Southeast Alaska chinook salmon escapement surveys as entered into Commercial Fisheries Division Integrated Fisheries Database (IFDB/ALEX).** Includes all surveys where chinook salmon were observed, many are not used to estimate escapement.

| Stream no. | Stream | Date | Tidal | Mouth | Live | Dead | Total | Survey | Obs[a] | Use[b] | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 10115090 | Marx Creek-Hyder | 8/14/00 | 0 | 0 | 1 | 0 | 1 | F | TPZ | 2 | Timothy P. Zadina |
| 10130030 | Keta River | 8/14/00 | 0 | 0 | 232 | 0 | 232 | H | KAP | 3 | 40 above chute |
| 10130030 | Keta River | 8/18/00 | 0 | 0 | 121 | 0 | 121 | H | KAP | 2 | Poor visibility |
| 10130030 | Keta River | 8/28/00 | 0 | 0 | 300 | 0 | 300 | H | KAP | 3 | 55 below camp |
| 10145007 | Herring Cove | 6/26/00 | 1000 | 0 | 0 | 0 | 1000 | A | PSD | 2 | |
| 10155040 | Blossom River | 8/14/00 | 0 | 0 | 94 | 0 | 94 | H | KAP | 2 | |
| 10155040 | Blossom River | 8/28/00 | 0 | 0 | 231 | 0 | 231 | H | KAP | 3 | |
| 10171004 | Chickamin River | 8/19/00 | 0 | 0 | 801 | 0 | 801 | H | KAP | 3 | Peak total |
| 1017104A | Barrier Creek | 8/7/00 | 0 | 0 | 15 | 0 | 15 | H | KAP | 2 | |
| 1017104A | Barrier Creek | 8/13/00 | 0 | 0 | 27 | 0 | 27 | H | KAP | 3 | |
| 1017104A | Barrier Creek | 8/19/00 | 0 | 0 | 9 | 0 | 9 | H | KAP | 2 | |
| 1017104A | Barrier Creek | 10/10/00 | 0 | 0 | 2 | 0 | 2 | H | GMF | 2 | 2 post king salmon |
| 1017104B | Butler Creek | 8/7/00 | 0 | 0 | 230 | 0 | 230 | H | KAP | 3 | Excellent survey |
| 1017104B | Butler Creek | 8/19/00 | 0 | 0 | 125 | 0 | 125 | H | KAP | 2 | |
| 1017104C | Clear Creek | 8/7/00 | 0 | 0 | 40 | 0 | 40 | H | KAP | 2 | |
| 1017104C | Clear Creek | 8/19/00 | 0 | 0 | 38 | 0 | 38 | H | KAP | 2 | |
| 1017104H | Humpy Creek | 8/13/00 | 0 | 0 | 15 | 0 | 15 | H | KAP | 2 | |
| 1017104H | Humpy Creek | 8/19/00 | 0 | 0 | 20 | 0 | 20 | H | KAP | 3 | |
| 1017104I | Indian Creek | 8/7/00 | 0 | 0 | 63 | 0 | 63 | H | KAP | 2 | |
| 1017104I | Indian Creek | 8/19/00 | 0 | 0 | 9 | 0 | 9 | H | KAP | 1 | |
| 1017104K | King Creek | 8/7/00 | 0 | 0 | 130 | 0 | 130 | H | KAP | 2 | Partial survey |
| 1017104K | King Creek | 8/19/00 | 0 | 0 | 251 | 0 | 251 | H | KAP | 3 | Schooled-up |
| 1017104L | Leduc River | 8/7/00 | 0 | 0 | 47 | 0 | 47 | H | KAP | 2 | Clear at bottom |
| 1017104L | Leduc River | 8/19/00 | 0 | 0 | 61 | 0 | 61 | H | KAP | 3 | |
| 1017104S | South Fork Chickamin | 8/7/00 | 0 | 0 | 52 | 0 | 52 | H | KAP | 2 | |
| 1017104S | South Fork Chickamin | 8/13/00 | 0 | 0 | 102 | 0 | 102 | H | KAP | 3 | |
| 1017104S | South Fork Chickamin | 8/19/00 | 0 | 0 | 109 | 0 | 109 | H | KAP | 2 | |
| 10175015 | Eulachon River | 8/19/00 | 0 | 0 | 116 | 0 | 116 | H | KAP | 3 | Only 5 fish in left fork |
| 10175030 | Unuk River | 8/18/00 | 0 | 0 | 1341 | 0 | 1341 | H | KAP | 3 | Peak total |
| 1017503B | Boundary Cr Unik R | 8/14/00 | 0 | 0 | 19 | 0 | 19 | H | KAP | 2 | |
| 1017530C | Clear Creek-Unuk R | 8/13/00 | 0 | 0 | 86 | 0 | 86 | H | KAP | 2 | |
| 1017530C | Clear Creek-Unuk R | 8/19/00 | 0 | 0 | 80 | 0 | 80 | H | KAP | 3 | |
| 1017530G | Genes Lake CreekUnuk | 8/13/00 | 0 | 300 | 0 | 0 | 300 | H | KAP | 2 | In lake |
| 1017530G | Genes Lake CreekUnuk | 8/14/00 | 0 | 0 | 265 | 0 | 265 | F | KAP | 3 | Foot survey by Casey |

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**Appendix A3.–Page 2 of 3.**

| Stream no. | Stream | Date | Tidal | Mouth | Live | Dead | Total | Survey | Obs[a] | Use[b] | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1017530G | Genes Lake CreekUnuk | 8/19/00 | 0 | 300 | 0 | 0 | 300 | H | KAP | 3 | In lake; lots of sockeye |
| 1017530K | Kerr Creek-Unuk R | 8/13/00 | 0 | 0 | 65 | 0 | 65 | H | KAP | 3 | murky at bottom |
| 1017530K | Kerr Creek-Unuk R | 8/19/00 | 0 | 0 | 68 | 0 | 68 | H | KAP | 3 | Lots of whitetails |
| 1017530L | Lake Creek-Unuk R | 8/13/00 | 0 | 0 | 56 | 0 | 56 | H | KAP | 3 | 51 at riffles |
| 1017530L | Lake Creek-Unuk R | 8/19/00 | 0 | 0 | 51 | 0 | 51 | H | KAP | 3 | Lots of whitetails |
| 1017530Q | Cripple Ck-Unuk R | 8/14/00 | 0 | 0 | 450 | 0 | 450 | F | KAP | 3 | Foot survey by Ed Jones |
| 10180070 | Hatchery Ck-Yes Bay | 8/31/00 | 0 | 0 | 38 | 8 | 46 | F | TPZ | 2 | |
| 10180070 | Hatchery Ck-Yes Bay | 9/12/00 | 0 | 0 | 0 | 4 | 4 | F | SCH | 2 | |
| 10180070 | Hatchery Ck-Yes Bay | 9/20/00 | 0 | 0 | 0 | 1 | 1 | F | TPZ | 2 | |
| 10190029 | Traitors Cove Creek | 8/9/00 | 0 | 0 | 2 | 0 | 2 | F | AWP | 2 | |
| 10190029 | Traitors Cove Creek | 8/11/00 | 0 | 0 | 4 | 0 | 4 | F | AWP | 2 | |
| 10190029 | Traitors Cove Creek | 8/18/00 | 0 | 0 | 7 | 0 | 7 | F | AWP | 2 | |
| 10190029 | Traitors Cove Creek | 8/30/00 | 0 | 0 | 5 | 0 | 5 | F | AWP | 2 | poor visibility |
| 10644031 | Crystal Creek | 6/22/00 | 0 | 50 | 0 | 0 | 50 | A | BLL | 2 | NO FISH ABV RAPIDS |
| 10644031 | Crystal Creek | 6/28/00 | 50 | 0 | 50 | 0 | 100 | A | BLL | 2 | 12.8 TIDE,50 JUST OVER RAPIDS |
| 10644031 | Crystal Creek | 6/30/00 | 400 | 0 | 0 | 0 | 400 | A | WRB | 2 | 230 ABV RAPIDS,170 BELOW |
| 10644031 | Crystal Creek | 7/2/00 | 330 | 0 | 0 | 0 | 330 | A | WRB | 1 | 80 ABV RAPIDS 25 BLW |
| 10644031 | Crystal Creek | 7/7/00 | 380 | 400 | 5 | 0 | 785 | A | WRB | 2 | 130 ABV RAPIDS 250 BLW |
| 10644031 | Crystal Creek | 7/10/00 | 700 | 550 | 0 | 2 | 1252 | A | WRB | 2 | 470 ABV RAPIDS 230 BLW |
| 10644031 | Crystal Creek | 7/11/00 | 1090 | 200 | 0 | 0 | 1290 | A | WRB | 2 | 840 ABV RAPIDS 250 BLW |
| 10644031 | Crystal Creek | 7/12/00 | 1380 | 120 | 0 | 0 | 1500 | A | WRB | 2 | 1210 ABV RPDS 170 BLW 4PM |
| 10644031 | Crystal Creek | 7/14/00 | 1160 | 360 | 0 | 0 | 1520 | A | WRB | 1 | 870 ABV RPDS 650 BLW 4PM |
| 10644031 | Crystal Creek | 7/14/00 | 1340 | 520 | 0 | 0 | 1860 | A | WRB | 2 | 1120 ABV RAPIDS 220 BLW |
| 10644031 | Crystal Creek | 7/16/00 | 940 | 400 | 0 | 1 | 1341 | A | WRB | 1 | FEWER ABV RAPIDS 10:30AM |
| 10644031 | Crystal Creek | 7/21/00 | 590 | 0 | 0 | 0 | 590 | A | WRB | 1 | 550 ABV RAPIDS, 40 BLW |
| 10740024 | Aaron Creek | 8/9/00 | 0 | 0 | 16 | 0 | 16 | A | WRB | 1 | TO GLACIAL FOR GOOD COUNT |
| 10740053 | Bradfield River E Fk | 8/9/00 | 0 | 0 | 33 | 0 | 33 | A | WRB | 1 | WATER TO HIGH FOR A GOOD COUNT |
| 10840020 | Andrews Creek | 8/3/00 | 0 | 60 | 780 | 0 | 840 | A | WRB | 2 | INC 40 IN E. ARM |
| 10840020 | Andrews Creek | 8/7/00 | 0 | 0 | 639 | 4 | 643 | F | TWR | 2 | 15 ADULT IN N FORK |
| 10840020 | Andrews Creek | 8/7/00 | 0 | 0 | 583 | 0 | 583 | H | KAP | 3 | |
| 10840020 | Andrews Creek | 8/9/00 | 0 | 30 | 650 | 10 | 690 | A | WRB | 2 | |
| 10840020 | Andrews Creek | 8/18/00 | 0 | 0 | 367 | 0 | 367 | A | BLL | 2 | |
| 10841007 | Stikine N Arm Mouth | 8/3/00 | 0 | 0 | 30 | 0 | 30 | A | WRB | 2 | LG ENOUGH FISH TO BE KINGS |
| 10841010 | North Arm Creek | 8/3/00 | 0 | 0 | 35 | 0 | 35 | A | WRB | 2 | TOO MANY DOGS FOR ACCURATE COUNT |
| 10841010 | North Arm Creek | 8/9/00 | 0 | 0 | 25 | 5 | 30 | A | WRB | 2 | TOO MANY DOGS FOR ACCURATE COUNT |

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**Appendix A3.–Page 3 of 4.**

| Stream no. | Stream | Date | Tidal | Mouth | Live | Dead | Total | Survey | Obs[a] | Use[b] | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 10880120 | Little Talhtan River | 7/30/00 | 0 | 0 | 2270 | 0 | 2270 | H | JAD | 2 | Backseat training survey |
| 10880120 | Little Talhtan River | 7/30/00 | 0 | 0 | 2517 | 40 | 2557 | H | KAP | 2 | Poor visibility |
| 10880120 | Little Talhtan River | 8/6/00 | 0 | 0 | 1904 | 816 | 2720 | H | KAP | 3 | |
| 10880120 | Little Talhtan River | 8/19/00 | 0 | 0 | 6883 | 0 | 6883 | W | DFO | 3 | Weir count |
| 10910006 | Sashin Ck P Walter N | 8/10/00 | 0 | 200 | 0 | 0 | 200 | A | WMD | 1 | |
| 11014007 | Farragut River | 8/3/00 | 0 | 0 | 15 | 0 | 15 | A | WRB | 1 | 80% GLACIAL |
| 11032009 | Chuck R Windham Bay | 7/2/00 | 0 | 0 | 4 | 0 | 4 | A | WRB | 2 | BELOW GORGE |
| 11032009 | Chuck R Windham Bay | 8/7/00 | 0 | 0 | 18 | 0 | 18 | A | WRB | 2 | SHADOW 8:30 AM |
| 11034003 | Rusty River | 8/3/00 | 0 | 0 | 4 | 0 | 4 | A | WRB | 2 | PARTIALY GLACIAL |
| 11117010 | King Salmon River | 7/26/00 | 0 | 0 | 64 | 0 | 64 | H | KAP | 1 | Poor visibility |
| 11117010 | King Salmon River | 7/28/00 | 0 | 0 | 91 | 0 | 91 | F | KAP | 3 | Plus 7 jacks |
| 11117010 | King Salmon River | 7/28/00 | 0 | 0 | 71 | 0 | 71 | H | KAP | 3 | |
| 11132220 | Nakina River | 7/30/00 | 0 | 0 | 77 | 0 | 77 | H | KAP | 3 | Index area IV |
| 11132220 | Nakina River | 7/30/00 | 0 | 0 | 730 | 0 | 730 | H | KAP | 3 | Index area III |
| 11132220 | Nakina River | 7/30/00 | 0 | 0 | 420 | 0 | 420 | H | KAP | 3 | Index area II |
| 11132220 | Nakina River | 7/30/00 | 0 | 0 | 1207 | 0 | 1207 | H | KAP | 3 | Index area I |
| 11132220 | Nakina River | 8/6/00 | 0 | 0 | 815 | 0 | 815 | H | KAP | 3 | Index area I |
| 11132220 | Nakina River | 8/6/00 | 0 | 0 | 2885 | 22 | 2907 | H | KAP | 3 | Peak total |
| 11132220 | Nakina River | 8/6/00 | 0 | 0 | 390 | 10 | 400 | H | KAP | 3 | Index area IV |
| 11132220 | Nakina River | 8/6/00 | 0 | 0 | 1460 | 10 | 1470 | H | KAP | 3 | Index area III |
| 11132220 | Nakina River | 8/6/00 | 0 | 0 | 220 | 0 | 220 | H | KAP | 3 | Index area II |
| 11132240 | Kowatua Creek | 8/13/00 | 0 | 0 | 628 | 0 | 628 | H | KAP | 3 | |
| 11132240 | Kowatua Creek | 8/21/00 | 0 | 0 | 692 | 10 | 702 | H | KAP | 3 | |
| 11132240 | Kowatua Creek | 8/25/00 | 0 | 0 | 241 | 0 | 241 | H | JAD | 2 | |
| 11132255 | Tatsamenie River | 8/21/00 | 0 | 0 | 953 | 0 | 953 | H | KAP | 3 | 750 below Little Tats |
| 11132255 | Tatsamenie River | 8/25/00 | 0 | 0 | 763 | 0 | 763 | H | JAD | 2 | Index areas I and II combined |
| 11132270 | Nahlin River | 7/19/00 | 0 | 0 | 162 | 0 | 162 | H | KAP | 2 | Index area II |
| 11132270 | Nahlin River | 7/19/00 | 0 | 0 | 447 | 0 | 447 | H | KAP | 3 | Index area III |
| 11132270 | Nahlin River | 7/30/00 | 0 | 0 | 722 | 6 | 728 | H | KAP | 3 | Peak total |
| 11132270 | Nahlin River | 7/30/00 | 0 | 0 | 46 | 0 | 46 | H | KAP | 3 | Index area I |
| 11132270 | Nahlin River | 7/30/00 | 0 | 0 | 39 | 0 | 39 | H | JAD | 2 | Index area I; replicate survey |
| 11132270 | Nahlin River | 7/30/00 | 0 | 0 | 310 | 5 | 315 | H | KAP | 3 | Index area II |
| 11132270 | Nahlin River | 7/30/00 | 0 | 0 | 366 | 1 | 367 | H | KAP | 2 | Index area III |
| 11132270 | Nahlin River | 7/30/00 | 0 | 0 | 307 | 0 | 307 | H | JAD | 2 | Index area II; replicate survey |
| 11132270 | Nahlin River | 7/30/00 | 0 | 0 | 283 | 0 | 283 | H | JAD | 2 | Index area III; backseat replicate survey |

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**Appendix A3.–Page 4 of 4.**

| Stream no. | Stream | Date | Tidal | Mouth | Live | Dead | Total | Survey | Obs[a] | Use[b] | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 11132275 | Tseta Creek | 7/30/00 | 0 | 0 | 113 | 0 | 113 | H | JAD | 2 | Replicate survey |
| 11132275 | Tseta Creek | 7/30/00 | 0 | 0 | 130 | 0 | 130 | H | KAP | 2 | 118 up top; lots of whitetails |
| 11132275 | Tseta Creek | 8/6/00 | 0 | 0 | 159 | 1 | 160 | H | KAP | 3 | All whitetails |
| 11132280 | Dudidontu River | 7/31/00 | 0 | 0 | 344 | 0 | 344 | H | JAD | 1 | Backseat training survey |
| 11132280 | Dudidontu River | 7/31/00 | 0 | 0 | 431 | 2 | 433 | H | KAP | 3 | |
| 11132280 | Dudidontu River | 8/6/00 | 0 | 0 | 477 | 5 | 482 | H | KAP | 3 | |
| 11150069 | Fish Creek-Douglas I | 8/24/00 | 35 | 0 | 69 | 4 | 108 | F | LED | 2 | |
| 11341019 | Indian River Sitka | 8/26/00 | 30 | 0 | 20 | 0 | 50 | F | EVP | 1 | Kings all very rotten, Saw kings in higher holes earlier wee |
| 11341021 | Sawmill Creek-Sitka | 7/29/00 | 0 | 2 | 0 | 0 | 2 | B | EVP | 1 | |
| 11532054 | Big Boulder Creek | 8/7/00 | 0 | 0 | 77 | 0 | 77 | F | RPE | 3 | +5 jacks, more fish were present later but no survey due t |
| 18230020 | Kluckshu River (CAN) | 9/5/00 | 0 | 0 | 1363 | 0 | 1363 | W | DFO | 3 | Weir count |
| 18230042 | Tatshenshine R (CAN) | 8/1/00 | 0 | 0 | 46 | 1 | 47 | F | KAP | 2 | Low Fog Creek |
| 18230043 | Takhanni River (CAN) | 8/1/00 | 0 | 0 | 102 | 0 | 102 | H | JAD | 2 | Backseat training flight |
| 18230043 | Takhanni River (CAN) | 8/1/00 | 0 | 0 | 152 | 0 | 152 | H | KAP | 3 | |
| 18230045 | Goat Creek | 8/1/00 | 0 | 0 | 33 | 0 | 33 | H | KAP | 2 | |
| 18230050 | Blanchard Ck (CAN) | 8/1/00 | 0 | 0 | 168 | 0 | 168 | H | JAD | 2 | Training flight |
| 18230050 | Blanchard Ck (CAN) | 8/1/00 | 0 | 0 | 163 | 0 | 163 | H | KAP | 3 | Plus 30-40 above lake |

[a] Observer initials on file in Commercial Fisheries IFDB/ALEX database.

[b] IFDB Standard Usage Codes: 1= not useful for indexing or estimating escapement; 2= potentially useful for indexing or estimating escapement; 3= Potentially useful as the "peak" survey count for this species.

**Appendix A4.–Estimated abundance and composition by age and sex of the escapement of chinook salmon to select systems in Southeast Alaska and transboundary rivers, 2000.**

| | | Brood year and age class | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1998 | 1997 | 1996 | 1997 | 1996 | 1995 | 1996 | 1995 | 1994 | 1995 | 1994 | 1993 | 1994 | 1993 | |
| | | 0.1 | 1.1 | 2.1 | 0.2 | 1.2 | 2.2 | 0.3 | 1.3 | 2.3 | 0.4 | 1.4 | 2.4 | 0.5 | 1.5 | Total |
| **Panel A. Age composition of medium and large chinook salmon in the Keta River in 2000[a]** | | | | | | | | | | | | | | | | |
| Males | n | | | | 16 | 205 | | 8 | 58 | | 3 | 25 | | | | **315** |
| | % | | | | 3.9 | 47.6 | | 1.6 | 11.7 | | 0.6 | 5.0 | | | | **70.4** |
| | SE of % | | | | 1.1 | 4.7 | | 0.6 | 1.8 | | 0.4 | 1.1 | | | | **3.5** |
| | Escapement | | | | 50 | 614 | | 21 | 151 | | 8 | 65 | | | | **907** |
| | SE of Esc. | | | | 16 | 114 | | 8 | 27 | | 5 | 15 | | | | **138** |
| Females | n | | | | | 4 | | 5 | 93 | | 8 | 37 | | | | **147** |
| | % | | | | | 0.8 | | 1.0 | 18.7 | | 1.6 | 7.5 | | | | **29.6** |
| | SE of % | | | | | 0.4 | | 0.5 | 2.5 | | 0.6 | 1.4 | | | | **3.5** |
| | Escapement | | | | | 10 | | 13 | 241 | | 21 | 96 | | | | **382** |
| | SE of Esc. | | | | | 5 | | 6 | 39 | | 8 | 20 | | | | **56** |
| Combined | n | | | | 16 | 209 | | 13 | 151 | | 11 | 62 | | | | **462** |
| | % | | | | 3.9 | 48.4 | | 2.6 | 30.4 | | 2.2 | 12.5 | | | | **100.0** |
| | SE of % | | | | 1.1 | 4.6 | | 0.8 | 3.5 | | 0.7 | 1.9 | | | | |
| | Escapement | | | | 50 | 624 | | 34 | 392 | | 29 | 161 | | | | **1,289** |
| | SE of Esc. | | | | 16 | 115 | | 10 | 58 | | 9 | 28 | | | | **168** |
| [a] From: Freeman et al. 200l. | | | | | | | | | | | | | | | | |
| **Panel B. Age composition ofmedium and large chinook salmon in the Blossom River in 2000** | | | | | | | | | | | | | | | | |
| Males | n | | | | | 15 | | 1 | 12 | | 1 | 1 | | | | **30** |
| | % | | | | | 34.9 | | 2.3 | 27.9 | | 2.3 | 2.3 | | | | **69.8** |
| | SE of % | | | | | 7.4 | | 2.3 | 6.9 | | 2.3 | 2.3 | | | | **7.1** |
| | Escapement | | | | | 334 | | 22 | 267 | | 22 | 22 | | | | **668** |
| | SE of Esc. | | | | | | | | | | | | | | | |
| Females | n | | | | | | | 1 | 4 | | 1 | 7 | | | | **13** |
| | % | | | | | | | 2.3 | 9.3 | | 2.3 | 16.3 | | | | **30.2** |
| | SE of % | | | | | | | 2.3 | 4.5 | | 2.3 | 5.7 | | | | **7.1** |
| | Escapement | | | | | | | 22 | 89 | | 22 | 156 | | | | **289** |
| | SE of Esc. | | | | | | | | | | | | | | | |
| Combined | n | | | | | 15 | | 2 | 16 | | 2 | 8 | | | | **43** |
| | % | | | | | 34.9 | | 4.7 | 37.2 | | 4.7 | 18.6 | | | | **100.0** |
| | SE of % | | | | | 7.4 | | 3.2 | 7.5 | | 3.2 | 6.0 | | | | |
| | Escapement | | | | | 334 | | 45 | 356 | | 45 | 178 | | | | **957** |
| | SE of Esc. | | | | | | | | | | | | | | | |
| **Panel C. Age composition of medium and large chinook salmon in the Chickamin River in 2000** | | | | | | | | | | | | | | | | |
| Males | n | | | | | 43 | | | 46 | | | 17 | | | | **106** |
| | % | | | | | 23.0 | | | 24.6 | | | 9.1 | | | | **56.7** |
| | SE of % | | | | | 3.1 | | | 3.2 | | | 2.1 | | | | **3.6** |
| | Escapement | | | | | 957 | | | 1,024 | | | 378 | | | | **2,359** |
| | SE of Esc. | | | | | | | | | | | | | | | |
| Females | n | | | | | | | | 51 | | | 30 | | | | **81** |
| | % | | | | | | | | 27.3 | | | 16.0 | | | | **43.3** |
| | SE of % | | | | | | | | 3.3 | | | 2.7 | | | | **3.6** |
| | Escapement | | | | | | | | 1,135 | | | 668 | | | | **1,802** |
| | SE of Esc. | | | | | | | | | | | | | | | |
| Combined | n | | | | | 43 | | | 97 | | | 47 | | | | **187** |
| | % | | | | | 23.0 | | | 51.9 | | | 25.1 | | | | **100.0** |
| | SE of % | | | | | 3.1 | | | 3.7 | | | 3.2 | | | | |
| | Escapement | | | | | 957 | | | 2,158 | | | 1,046 | | | | **4,161** |
| | SE of Esc. | | | | | | | | | | | | | | | |

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**PANEL D. AGE COMPOSITION OF MEDIUM AND LARGE CHINOOK SALMON IN THE UNUK RIVER IN 2000**[b]

| | | BROOD YEAR AND AGE CLASS | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1998 | 1997 | 1996 | 1997 | 1996 | 1995 | 1996 | 1995 | 1994 | 1995 | 1994 | 1993 | 1994 | 1993 | |
| | | 0.1 | 1.1 | 2.1 | 0.2 | 1.2 | 2.2 | 0.3 | 1.3 | 2.3 | 0.4 | 1.4 | 2.4 | 0.5 | 1.5 | **Total** |
| Males | n | | 1 | | | 260 | | | 246 | | | 55 | | | 2 | **564** |
| | % | | 0.2 | | | 38.0 | | | 25.3 | | | 5.6 | | | 0.2 | **69.3** |
| | SE of % | | 0.2 | | | 7.3 | | | 3.1 | | | 1.0 | | | 0.1 | **4.0** |
| | Escapement | | 15 | | | 3,099 | | | 2,060 | | | 455 | | | 17 | **5,644** |
| | SE of Esc. | | 15 | | | 946 | | | 246 | | | 77 | | | 12 | **1,042** |
| Females | n | | | | | 5 | | | 174 | | | 120 | | | 4 | **303** |
| | % | | | | | 0.5 | | | 17.7 | | | 12.2 | | | 0.4 | **30.7** |
| | SE of % | | | | | 0.2 | | | 2.5 | | | 1.8 | | | 0.2 | **4.0** |
| | Escapement | | | | | 41 | | | 1,439 | | | 992 | | | 33 | **2,506** |
| | SE of Esc. | | | | | 19 | | | 184 | | | 136 | | | 17 | **296** |
| Combined | n | | 1 | | | 265 | | | 420 | | | 175 | | | 6 | **867** |
| | % | | 0.2 | | | 38.5 | | | 42.9 | | | 17.8 | | | 0.6 | **100.0** |
| | SE of % | | 0.2 | | | 7.2 | | | 5.1 | | | 2.5 | | | 0.3 | |
| | Escapement | | 15 | | | 3,140 | | | 3,499 | | | 1,447 | | | 50 | **8,150** |
| | SE of Esc. | | 15 | | | 946 | | | 394 | | | 185 | | | 21 | **1,163** |

[b] From: Jones and McPherson 2002.

**PANEL E. AGE COMPOSITION OF SMALL, MEDIUM AND LARGE CHINOOK SALMON IN THE STIKINE RIVER IN 2000** [c]

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Males | n | 1 | | 172 | 2 | 250 | | 174 | 1 | 8 | **608** |
| | % | 0. | | 26.9 | 0.1 | 18.2 | | 11.4 | 0.1 | 0.5 | **57.4** |
| | SE of % | 0.2 | | 3.7 | 0.1 | 1.3 | | 1.1 | 0.1 | 0.2 | **2.5** |
| | Escapement | 76 | | 10,743 | 52 | 7,263 | | 4,532 | 26 | 208 | **22,900** |
| | SE of Esc. | 76 | | 1,925 | 37 | 863 | | 608 | 26 | 77 | **2,585** |
| Females | n | | | 26 | | 296 | 1 | 280 | 2 | 6 | **611** |
| | % | | | 4.1 | | 19.6 | 0.1 | 18.3 | 0.1 | 0.4 | **42.6** |
| | SE of % | | | 1.0 | | 1.6 | 0.1 | 1.6 | 0.1 | 0.2 | **2.5** |
| | Escapement | | | 1,629 | | 7,810 | 26 | 7,293 | 52 | 156 | **16,966** |
| | SE of Esc. | | | 424 | | 965 | 26 | 918 | 37 | 66 | **1,840** |
| Combined | n | 1 | | 198 | 2 | 546 | 1 | 454 | 3 | 14 | **1,219** |
| | % | 0.2 | | 31.0 | 0.1 | 37.8 | 0.1 | 29.7 | 0.2 | 0.9 | **100.0** |
| | SE of % | 0.2 | | 4.2 | 0.1 | 2.3 | 0.1 | 2.3 | 0.1 | 0.3 | **0.0** |
| | Escapement | 76 | | 12,372 | 52 | 15,073 | 26 | 11,825 | 78 | 364 | **39,868** |
| | SE of Esc. | 76 | | 2,188 | 37 | 1,685 | 26 | 1,423 | 46 | 105 | **3,988** |

[c] From: DerHovanisian et al. 2001.

**PANEL F. AGE COMPOSITION OF MEDIUM AND LARGE CHINOOK SALMON IN ANDREW CREEK IN 2000**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Males | n | | | 13 | | 36 | | 10 | | | **59** |
| | % | | | 10.2 | | 28.1 | | 7.8 | | | **46.1** |
| | SE of % | | | 2.7 | | 4.0 | | 2.4 | | | **4.4** |
| | Escapement | | | 148 | | 410 | | 114 | | | **671** |
| | SE of Esc. | | | | | | | | | | |
| Females | n | | | 2 | | 38 | | 28 | | 1 | **69** |
| | % | | | 1.6 | | 29.7 | | 21.9 | | 0.8 | **53.9** |
| | SE of % | | | 1.1 | | 4.1 | | 3.7 | | 0.8 | **4.4** |
| | Escapement | | | 23 | | 432 | | 319 | | 11 | **785** |
| | SE of Esc. | | | | | | | | | | |
| Combined | n | | | 15 | | 74 | | 38 | | 1 | **128** |
| | % | | | 11.7 | | 57.8 | | 29.7 | | 0.8 | **100.0** |
| | SE of % | | | 2.9 | | 4.4 | | 4.1 | | 0.8 | **0.0** |
| | Escapement | | | 171 | | 842 | | 432 | | 11 | **1,456** |
| | SE of Esc. | | | | | | | | | | |

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**Appendix A4.–Page 3 of 5.**

| | | Brood year and age class | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1998 | 1997 | 1996 | 1997 | 1996 | 1995 | 1996 | 1995 | 1994 | 1995 | 1994 | 1993 | 1994 | 1993 | |
| | | 0.1 | 1.1 | 2.1 | 0.2 | 1.2 | 2.2 | 0.3 | 1.3 | 2.3 | 0.4 | 1.4 | 2.4 | 0.5 | 1.5 | Total |
| **Panel G. Age composition of medium and large chinook salmon in the King Salmon River in 2000** | | | | | | | | | | | | | | | | |
| Males | n | | | | | 8 | | | 9 | | | 2 | | | | **19** |
| | % | | | | | 20.5 | | | 23.1 | | | 5.1 | | | | **48.7** |
| | SE of % | | | | | 6.6 | | | 6.8 | | | 3.6 | | | | **8.1** |
| | Escapement | | | | | 35 | | | 40 | | | 9 | | | | **84** |
| | SE of Esc. | | | | | | | | | | | | | | | |
| Females | n | | | | | | | | 7 | | | 12 | 1 | | | **20** |
| | % | | | | | | | | 17.9 | | | 30.8 | 2.6 | | | **51.3** |
| | SE of % | | | | | | | | 6.2 | | | 7.5 | 2.6 | | | **8.1** |
| | Escapement | | | | | | | | 31 | | | 53 | 4 | | | **88** |
| | SE of Esc. | | | | | | | | | | | | | | | |
| Combined | n | | | | | 8 | | | 16 | | | 14 | 1 | | | **39** |
| | % | | | | | 20.5 | | | 41.0 | | | 35.9 | 2.6 | | | **100.0** |
| | SE of % | | | | | 6.6 | | | 8.0 | | | 7.8 | 2.6 | | | |
| | Escapement | | | | | 35 | | | 71 | | | 62 | 4 | | | **172** |
| | SE of Esc. | | | | | | | | | | | | | | | |
| **Panel H. Age composition of medium and large chinook salmon in the Taku River in 2000**[d] | | | | | | | | | | | | | | | | |
| Males | n | | 4 | | | 277 | 1 | | 269 | 2 | | 77 | | | | **630** |
| | % | | 0.3 | | | 23.5 | 0.1 | | 25.4 | 0.2 | | 7.4 | | | | **56.8** |
| | SE of % | | 0.2 | | | 3.8 | 0.1 | | 1.7 | 0.1 | | 0.9 | | | | **2.7** |
| | Escapement | | 130 | | | 9,228 | 33 | | 9,997 | 75 | | 2,891 | | | | **22,354** |
| | SE of Esc. | | 68 | | | 1,493 | 33 | | 1,733 | 54 | | 599 | | | | **2,970** |
| Females | n | | | | | 6 | 1 | | 312 | 1 | | 131 | 1 | | 1 | **453** |
| | % | | | | | 0.5 | 0.1 | | 29.7 | 0.1 | | 12.5 | 0.1 | | 0.1 | **43.2** |
| | SE of % | | | | | 0.2 | 0.1 | | 2.1 | 0.1 | | 1.2 | 0.1 | | 0.1 | **2.7** |
| | Escapement | | | | | 210 | 38 | | 11,696 | 38 | | 4,919 | 38 | | 38 | **16,977** |
| | SE of Esc. | | | | | 89 | 38 | | 2,116 | 38 | | 955 | 38 | | 38 | **3,019** |
| Combined | n | | 4 | | | 283 | 2 | | 581 | 3 | | 208 | 1 | | 1 | **1,083** |
| | % | | 0.3 | | | 24.0 | 0.2 | | 55.2 | 0.3 | | 19.9 | 0.1 | | 0.1 | **100.0** |
| | SE of % | | 0.3 | | | 3.8 | 0.1 | | 3.0 | 0.2 | | 1.6 | 0.1 | | 0.1 | |
| | Escapement | | 130 | | | 9,438 | 71 | | 21,693 | 113 | | 7,811 | 38 | | 38 | **39,331** |
| | SE of Esc. | | 68 | | | 1,515 | 50 | | 3,743 | 67 | | 1,460 | 38 | | 38 | **5,660** |
| [d] From: McPherson et al. 2002. | | | | | | | | | | | | | | | | |
| **Panel I. Age composition of medium and large chinook salmon in the Chilkat River in 2000**[e] | | | | | | | | | | | | | | | | |
| Males | n | | | | | 209 | | | 168 | | | 47 | | | 2 | **426** |
| | % | | | | | 23.2 | | | 26.5 | | | 9.0 | | | 0.6 | **59.4** |
| | SE of % | | | | | 1.7 | | | 1.8 | | | 1.1 | | | 0.3 | |
| | Escapement | | | | | 619 | | | 707 | | | 241 | | | 16 | **1,583** |
| | SE of Esc. | | | | | 120 | | | 128 | | | 54 | | | 11 | **184** |
| Females | n | | | | | 3 | | | 123 | | | 74 | | | 2 | **202** |
| | % | | | | | 0.4 | | | 24.1 | | | 15.5 | | | 0.6 | **40.6** |
| | SE of % | | | | | 0.2 | | | 1.7 | | | 1.4 | | | 0.3 | |
| | Escapement | | | | | 10 | | | 643 | | | 412 | | | 16 | **1,081** |
| | SE of Esc. | | | | | 6 | | | 118 | | | 81 | | | 11 | **144** |
| Combined | n | | | | | 212 | | | 291 | | | 121 | | | 4 | **628** |
| | % | | | | | 23.6 | | | 50.7 | | | 24.5 | | | 1.2 | **100.0** |
| | SE of % | | | | | 1.7 | | | 2.0 | | | 1.7 | | | 0.4 | |
| | Escapement | | | | | 629 | | | 1,350 | | | 653 | | | 32 | **2,664** |
| | SE of Esc. | | | | | 122 | | | 227 | | | 118 | | | 12 | **355** |
| [e] From: Ericksen 2001. | | | | | | | | | | | | | | | | |

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**PANEL J. AGE COMPOSITION OF MEDIUM AND LARGE CHINOOK SALMON IN THE ALSEK RIVER IN 2000**[f]

| | | Brood year and age class | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **1998** | **1997** | **1996** | **1997** | **1996** | **1995** | **1996** | **1995** | **1994** | **1995** | **1994** | **1993** | **1994** | **1993** | |
| | | **0.1** | **1.1** | **2.1** | **0.2** | **1.2** | **2.2** | **0.3** | **1.3** | **2.3** | **0.4** | **1.4** | **2.4** | **0.5** | **1.5** | **Total** |
| Males | n | | 3 | 2 | | 51 | 4 | | 211 | | | 76 | | | | **347** |
| | % | | 0.4 | 0.3 | | 6.7 | 0.5 | | 27.6 | | | 9.9 | | | | **45.3** |
| | SE of % | | 0.2 | 0.2 | | 0.9 | 0.3 | | 1.6 | | | 1.1 | | | | **1.8** |
| | Escapement | | 36 | 24 | | 613 | 48 | | 2,538 | | | 914 | | | | **4,173** |
| | SE of Esc. | | 21 | 17 | | 137 | 25 | | 477 | | | 191 | | | | **764** |
| Females | n | | | | | 9 | | | 349 | 2 | | 58 | | | | **418** |
| | % | | | | | 1.2 | | | 45.6 | 0.3 | | 7.6 | | | | **54.6** |
| | SE of % | | | | | 0.4 | | | 1.8 | 0.2 | | 1.0 | | | | **1.8** |
| | Escapement | | | | | 108 | | | 4,198 | 24 | | 698 | | | | **5,028** |
| | SE of Esc. | | | | | 40 | | | 768 | 17 | | 152 | | | | **914** |
| Combined | n | | 3 | 2 | | 60 | 4 | | 560 | 2 | | 134 | | | | **765** |
| | % | | 0.4 | 0.3 | | 7.8 | 0.5 | | 73.2 | 0.3 | | 17.5 | | | | **100.0** |
| | SE of % | | 0.2 | 0.3 | | 1.0 | 0.3 | | 1.6 | 0.2 | | 1.4 | | | | **0.0** |
| | Escapement | | 36 | 24 | | 721 | 48 | | 6,736 | 24 | | 1,612 | | | | **9,202** |
| | SE of Esc. | | 21 | 17 | | 156 | 25 | | 1,213 | 17 | | 314 | | | | **1,645** |

[f]From: Pahlke and Etherton 2001.

**PANEL K. AGE COMPOSITION OF MEDIUM AND LARGE CHINOOK SALMON IN THE SITUK RIVER IN 2000**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Males | n | 4 | 2 | | 4 | 3 | | 59 | 7 | 1 | 3 | | | | | **83** |
| | % | 8.6 | 4.3 | | 1.0 | 0.4 | | 24.0 | 3.3 | 0.5 | 1.1 | | | | | **43.2** |
| | SE of % | 1.9 | 1.4 | | 0.7 | 0.4 | | 2.9 | 1.2 | 0.5 | 0.7 | | | | | **3.3** |
| | Escapement | 195 | 98 | | 22 | 10 | | 545 | 75 | 12 | 24 | | | | | **980** |
| | SE of Esc. | | | | | | | | | | | | | | | |
| Females | n | | | | 3 | | | 111 | 8 | | 19 | 1 | | | | **142** |
| | % | | | | 0.7 | | | 45.2 | 3.8 | | 6.7 | | | | | **56.4** |
| | SE of % | | | | 0.6 | | | 3.3 | 1.3 | | 1.7 | | | | | **3.3** |
| | Escapement | | | | 16 | | | 1,025 | 85 | | 151 | | | | | **1,278** |
| | SE of Esc. | | | | | | | | | | | | | | | |
| Combined | n | 4 | 2 | | 7 | 3 | | 170 | 15 | 1 | 22 | 1 | | | | **225** |
| | % | 8.6 | 4.3 | | 1.7 | 0.4 | | 693 | 7.1 | 0.5 | 7.7 | 0.4 | | | | **100.0** |
| | SE of % | 1.9 | 1.4 | | 0.9 | 0.4 | | 3.1 | 1.7 | 0.5 | 1.8 | 0.4 | | | | |
| | Escapement | 195 | 98 | | 38 | 10 | | 1,570 | 160 | 12 | 175 | 9 | | | | **2,267** |
| | SE of Esc. | | | | | | | | | | | | | | | |

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**SUMMARY. PERCENTAGE AGE COMPOSITION ESTIMATED FROMCHINOOK SALMON SAMP LED IN 11 SOUTHEAST ALASKA RIVERS IN 2000**

| | BROOD YEAR AND AGE CLASS | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1998 | 1997 | 1996 | 1997 | 1996 | 1995 | 1996 | 1995 | 1994 | 1995 | 1994 | 1993 | 1994 | 1993 |
| | 0.1 | 1.1 | 2.1 | 0.2 | 1.2 | 2.2 | 0.3 | 1.3 | 2.3 | 0.4 | 1.4 | 2.4 | 0.5 | 1.5 |
| 1. Keta | NE | NE | | 4% | 48% | | 3% | 30% | | 2% | 13% | | | |
| 2. Blossom | NE | NE | | | 35% | | 5% | 37% | | 5% | 19% | | | |
| 3. Chickamin | NE | NE | | | 23% | | | 52% | | | 25% | | | |
| 4. Unuk | NE | <1% | | | 40% | | | 42% | | | 17% | | | |
| 5. Stikine | NE | <1% | | | 31% | <1% | | 38% | <1% | | 30% | <1% | | 1% |
| 6. Andrew Cr | NE | NE | | | 12% | | | 58% | | | 30% | | | 1% |
| 7. King Salmon | NE | NE | | | 21% | | | 41% | | | 36% | 3% | | |
| 8. Taku | NE | <1% | | | 24% | <1% | | 55% | <1% | | 20% | <1% | | <1% |
| 9. Chilkat | NE | NE | | | 24% | | | 51% | | | 25% | | | 1% |
| 10. Alsek | NE | <1% | <1% | | 8% | <1% | | 73% | <1% | | 18% | | | |
| 11. Situk | 9% | 4% | | 2% | <1% | | 69% | 7% | | 8% | <1% | | | |

**SUMMARY. ESTIMATED NUMBERS OF CHINOOK SALMON BY AGE CLASS IN ESCAPEMEN TS TO 11 SOUTHEAST ALASKA RIVERS IN 2000**

| | BROOD YEAR AND AGE CLASS | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1998 | 1997 | 1996 | 1997 | 1996 | 1995 | 1996 | 1995 | 1994 | 1995 | 1994 | 1993 | 1994 | 1993 | |
| | 0.1 | 1.1 | 2.1 | 0.2 | 1.2 | 2.2 | 0.3 | 1.3 | 2.3 | 0.4 | 1.4 | 2.4 | 0.5 | 1.5 | Total |
| 1. Keta | 0 | 0 | 0 | 50 | 624 | 0 | 34 | 392 | 0 | 29 | 161 | 0 | 0 | 0 | 1,290 |
| 2. Blossom | 0 | 0 | 0 | 0 | 334 | 0 | 45 | 356 | 0 | 45 | 178 | 0 | 0 | 0 | 957 |
| 3. Chickamin | 0 | 0 | 0 | 0 | 957 | 0 | 0 | 2,158 | 0 | 0 | 1,046 | 0 | 0 | 0 | 4,161 |
| 4. Unuk | 0 | 16 | 0 | 0 | 3,317 | 0 | 0 | 3,503 | 0 | 0 | 1,447 | 0 | 0 | 50 | 8,333 |
| 5. Stikine | 0 | 76 | 0 | 0 | 12,372 | 52 | 0 | 15,073 | 26 | | 11,825 | 78 | 0 | 364 | 39,866 |
| 6. Andrew Cr | 0 | 0 | 0 | 0 | 171 | 0 | 0 | 842 | 0 | 0 | 432 | 0 | 0 | 11 | 1,456 |
| 7. King Salmon | 0 | 0 | 0 | 0 | 35 | 0 | 0 | 71 | 0 | 0 | 62 | 4 | 0 | 0 | 172 |
| 8. Taku | 0 | 130 | 0 | 0 | 9,438 | 71 | 0 | 21,693 | 113 | 0 | 7,811 | 38 | 0 | 38 | 39,332 |
| 9. Chilkat | 0 | 0 | 0 | 0 | 629 | 0 | 0 | 1,350 | 0 | 0 | 653 | 0 | 0 | 32 | 2,664 |
| 10. Alsek | 0 | 36 | 24 | 0 | 721 | 48 | 0 | 6,736 | 24 | 0 | 1,612 | 0 | 0 | 0 | 9,201 |
| 11. Situk | 195 | 98 | 0 | 38 | 10 | 0 | 1,570 | 160 | 12 | 175 | 9 | 0 | 0 | 0 | 2,267 |

**SUMMARY. PERCENTAGE SEX COMPOSITION THAT WERE MALES BY AGE CLASSS ESTIMATED FROMCHINOOK SALMON SAMPLED IN 11 SOUTHEAST ALASKA RIVERS IN 2000**

| | BROOD YEAR AND AGE CLASS | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1998 | 1997 | 1996 | 1997 | 1996 | 1995 | 1996 | 1995 | 1994 | 1995 | 1994 | 1993 | 1994 | 1993 |
| | 0.1 | 1.1 | 2.1 | 0.2 | 1.2 | 2.2 | 0.3 | 1.3 | 2.3 | 0.4 | 1.4 | 2.4 | 0.5 | 1.5 |
| 1. Keta | | | | 100% | 98% | | 62% | 39% | | 28% | 40% | | | |
| 2. Blossom | | | | | 100% | | | 75% | | | 13% | | | |
| 3. Chickamin | | | | | 100% | | | 47% | | | 36% | | | |
| 4. Unuk | | 100% | | | 99% | | | 59% | | | 31% | | | 34% |
| 5. Stikine | | 100% | | | 87% | | | 48% | | | 38% | | | 57% |
| 6. Andrew Cr | | | | | 87% | | | 49% | | | 26% | | | |
| 7. King Salmon | | | | | 100% | | | 56% | | | 14% | | | |
| 8. Taku | | 100% | | | 98% | | | 46% | | | 37% | | | |
| 9. Chilkat | | | | | 98% | | | 52% | | | 37% | | | 50% |
| 10. Alsek | | 100% | | | 85% | 100% | | 38% | | | 57% | | | |
| 11. Situk | 100% | 100% | | 57% | | | 35% | 47% | | 14% | | | | |

**Appendix A5.–Average length (MEF), by age, of chinook salmon in selected systems in Southeast Alaska and transboundary rivers, 2000.**

| | | Brood year and age class | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1998 | 1997 | 1996 | 1997 | 1996 | 1995 | 1996 | 1995 | 1994 | 1995 | 1994 | 1993 | 1994 | 1993 |
| | | 0.1 | 1.1 | 2.1 | 0.2 | 1.2 | 2.2 | 0.3 | 1.3 | 2.3 | 0.4 | 1.4 | 2.4 | 0.5 | 1.5 |
| **Panel A. Average length of chinook salmon in the Keta River in 2000[a]** | | | | | | | | | | | | | | | |
| Males | n | 1 | 19 | | 16 | 207 | | 8 | 53 | | 3 | 22 | | | |
| | Average length | 450 | 412 | | 648 | 650 | | 844 | 833 | | 908 | 931 | | | |
| | SD | | 19 | | 52 | 62 | | 82 | 87 | | 90 | 80 | | | |
| | SE | | 4 | | 13 | 4 | | 29 | 12 | | 52 | 17 | | | |
| Females | n | | | | | 3 | | 5 | 80 | | 7 | 35 | | 1 | |
| | Average length | | | | | 728 | | 852 | 844 | | 907 | 914 | | 960 | |
| | SD | | | | | 18 | | 32 | 48 | | 52 | 50 | | | |
| | SE | | | | | 10 | | 14 | 5 | | 20 | 8 | | | |
| Combined | n | 1 | 19 | | 16 | 210 | | 13 | 133 | | 10 | 57 | | 1 | |
| | Average length | 450 | 412 | | 648 | 651 | | 847 | 839 | | 908 | 921 | | 960 | |
| | SD | | 19 | | 52 | 62 | | 65 | 66 | | 60 | 63 | | | |
| | SE | | 4 | | 13 | 4 | | 18 | 6 | | 19 | 8 | | | |
| **Panel B. Average length of chinook salmon in the Blossom River in 2000** | | | | | | | | | | | | | | | |
| Males | n | | | | | 15 | | 1 | 12 | | 1 | 1 | | | |
| | Average length | | | | | 673 | | 695 | 835 | | 980 | 950 | | | |
| | SD | | | | | 49 | | | 63 | | | | | | |
| | SE | | | | | 13 | | | 18 | | | | | | |
| Females | n | | | | | | | 1 | 4 | | 1 | 7 | | | |
| | Average length | | | | | | | 810 | 871 | | 835 | 896 | | | |
| | SD | | | | | | | | 61 | | | 53 | | | |
| | SE | | | | | | | | 31 | | | 20 | | | |
| Combined | n | | | | | 15 | | 2 | 16 | | 2 | 8 | | | |
| | Average length | | | | | 673 | | 753 | 844 | | 908 | 903 | | | |
| | SD | | | | | 49 | | 81 | 63 | | 103 | 52 | | | |
| | SE | | | | | 13 | | 57 | 16 | | 73 | 18 | | | |
| **Panel C. Average length of chinook salmon in the Chickamin River in 2000** | | | | | | | | | | | | | | | |
| Males | n | | | | | 43 | | | 46 | | | 17 | | | |
| | Average length | | | | | 667 | | | 793 | | | 930 | | | |
| | SD | | | | | 50 | | | 65 | | | 61 | | | |
| | SE | | | | | 8 | | | 10 | | | 15 | | | |
| Females | n | | | | | | | | 51 | | | 30 | | | |
| | Average length | | | | | | | | 844 | | | 905 | | | |
| | SD | | | | | | | | 45 | | | 46 | | | |
| | SE | | | | | | | | 6 | | | 8 | | | |
| Combined | n | | | | | 43 | | | 97 | | | 47 | | | |
| | Average length | | | | | 667 | | | 820 | | | 914 | | | |
| | SD | | | | | 50 | | | 61 | | | 53 | | | |
| | SE | | | | | 8 | | | 6 | | | 8 | | | |

[a] From: Freeman et al 2001.

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**Appendix A5. –Page 2 of 5.**

| | Brood year and age class | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **1998** | **1997** | **1996** | **1997** | **1996** | **1995** | **1996** | **1995** | **1994** | **1995** | **1994** | **1993** | **1994** | **1993** |
| | **0.1** | **1.1** | **2.1** | **0.2** | **1.2** | **2.2** | **0.3** | **1.3** | **2.3** | **0.4** | **1.4** | **2.4** | **0.5** | **1.5** |
| **Panel D. Average length of chinook salmon in the Unuk River in 2000[b]** | | | | | | | | | | | | | | |
| Males n | | 10 | | | 260 | | | 246 | | | 55 | | | 2 |
| Average length | | 370 | | | 642 | | | 789 | | | 910 | | | 938 |
| SD | | 30 | | | 50 | | | 64 | | | 60 | | | 124 |
| SE | | 10 | | | 3 | | | 4 | | | 8 | | | 88 |
| Females n | | | | | 5 | | | 174 | | | 120 | | | 4 |
| Average length | | | | | 726 | | | 816 | | | 884 | | | 975 |
| SD | | | | | 38 | | | 42 | | | 46 | | | 36 |
| SE | | | | | 17 | | | 3 | | | 4 | | | 18 |
| Combined n | | 10 | | | 265 | | | 420 | | | 175 | | | 6 |
| Average length | | 370 | | | 644 | | | 800 | | | 892 | | | 963 |
| SD | | 30 | | | 51 | | | 57 | | | 52 | | | 65 |
| SE | | 10 | | | 3 | | | 3 | | | 4 | | | 27 |
| **Panel E. Average length of chinook salmon in the Stikine River in 2000[c]** | | | | | | | | | | | | | | |
| Males n | | 1 | | | 100 | 2 | | 117 | | | 142 | 1 | | 8 |
| Average length | | 500 | | | 628 | 712 | | 778 | | | 889 | 928 | | 912 |
| SD | | | | | 60 | 64 | | 76 | | | 48 | | | 42 |
| SE | | | | | 6 | 45 | | 7 | | | 4 | | | 15 |
| Females n | | | | | 23 | | | 155 | 1 | | 230 | 2 | | 5 |
| Average length | | | | | 635 | | | 784 | 814 | | 839 | 824 | | 870 |
| SD | | | | | 67 | | | 50 | | | 45 | 24 | | 40 |
| SE | | | | | 14 | | | 4 | | | 3 | 17 | | 18 |
| Combined n | | 1 | | | 123 | 2 | | 272 | 1 | | 372 | 3 | | 13 |
| Average length | | 500 | | | 629 | 712 | | 781 | 814 | | 858 | 858 | | 896 |
| SD | | | | | 67 | 64 | | 66 | | | 39 | 62 | | 47 |
| SE | | | | | 6 | 45 | | 4 | | | 2 | 36 | | 13 |
| **Panel F. Average length of chinook salmon in Andrew Creek in 2000** | | | | | | | | | | | | | | |
| Males n | | | | | 13 | | | 36 | | | 10 | | | |
| Average length | | | | | 590 | | | 739 | | | 846 | | | |
| SD | | | | | 79 | | | 72 | | | 41 | | | |
| SE | | | | | 22 | | | 12 | | | 13 | | | |
| Females n | | | | | 2 | | | 38 | | | 28 | | | 1 |
| Average length | | | | | 713 | | | 779 | | | 829 | | | 935 |
| SD | | | | | 25 | | | 43 | | | 37 | | | |
| SE | | | | | 18 | | | 7 | | | 7 | | | |
| Combined n | | | | | 15 | | | 74 | | | 38 | | | 1 |
| Average length | | | | | 606 | | | 760 | | | 833 | | | 935 |
| SD | | | | | 85 | | | 60 | | | 37 | | | |
| SE | | | | | 22 | | | 7 | | | 6 | | | |

[b] From: Jones and McPherson 2001.

[c] From: DerHovanisian et al. 2001.

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| PANEL G. AVERAGE LENGTH OF CHINOOK SALMON IN THE KING SALMON RIVER IN 2000 | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | BROOD YEAR AND AGE CLASS | | | | | | | | | | | | | |
| | 1998 | 1997 | 1996 | 1997 | 1996 | 1995 | 1996 | 1995 | 1994 | 1995 | 1994 | 1993 | 1994 | 1993 |
| | 0.1 | 1.1 | 2.1 | 0.2 | 1.2 | 2.2 | 0.3 | 1.3 | 2.3 | 0.4 | 1.4 | 2.4 | 0.5 | 1.5 |
| Males n | | | | | 8 | | | 9 | | | 2 | | | |
| Average length | | | | | 650 | | | 754 | | | 880 | | | |
| SD | | | | | 30 | | | 25 | | | 49 | | | |
| SE | | | | | 11 | | | 8 | | | 35 | | | |
| Females n | | | | | | | | 7 | | | 12 | 1 | | |
| Average length | | | | | | | | 787 | | | 817 | 890 | | |
| SD | | | | | | | | 30 | | | 52 | | | |
| SE | | | | | | | | 11 | | | 15 | | | |
| Combined n | | | | | 8 | | | 16 | | | 14 | 1 | | |
| Average length | | | | | 650 | | | 769 | | | 826 | 890 | | |
| SD | | | | | 30 | | | 31 | | | 55 | | | |
| SE | | | | | 11 | | | 8 | | | 15 | | | |

| PANEL H. AVERAGE LENGTH OF CHINOOK SALMON IN THE TAKU RIVER IN 2000[d] | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Males n | 56 | | 278 | 1 | 269 | 2 | 77 | | |
| Average length | 349 | | 584 | 615 | 754 | 833 | 876 | | |
| SD | 85 | | 72 | | 66 | 4 | 56 | | |
| SE | 11 | | 4 | | 4 | 3 | 6 | | |
| Females n | | | 6 | 1 | 312 | 1 | 131 | 1 | 1 |
| Average length | | | 657 | 680 | 773 | 800 | 826 | 875 | 895 |
| SD | | | 70 | | 46 | | 42 | | |
| SE | | | 29 | | 3 | | 4 | | |
| Combined n | 56 | | 284 | 2 | 581 | 3 | 208 | 1 | 1 |
| Average length | 349 | | 586 | 648 | 764 | 822 | 845 | 875 | 895 |
| SD | 85 | | 72 | 46 | 57 | 19 | 54 | | |
| SE | 11 | | 4 | 33 | 2 | 11 | 4 | | |

[d] From: McPherson et al. 2002.

| PANEL I. AVERAGE LENGTH OF CHINOOK SALMON IN THE CHILKAT RIVER IN 2000[e] | | | | | |
|---|---|---|---|---|---|
| Males n | 65 | 209 | 168 | 47 | 2 |
| Average length | 379 | 574 | 762 | 892 | 858 |
| SD | 27 | 73 | 80 | 69 | 4 |
| SE | 3 | 5 | 6 | 10 | 3 |
| Females n | | 3 | 123 | 74 | 2 |
| Average length | | 732 | 795 | 858 | 875 |
| SD | | 14 | 41 | 41 | 35 |
| SE | | 8 | 4 | 5 | 25 |
| Combined n | 65 | 212 | 291 | 121 | 4 |
| Average length | 379 | 576 | 776 | 871 | 866 |
| SD | 27 | 75 | 68 | 56 | 23 |
| SE | 3 | 5 | 4 | 5 | 11 |

[e] From: Ericksen 2001.

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| PANEL J. AVERAGE LENGTH OF CHINOOK SALMON IN THE ALSEK RIVER IN 2000[f] | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BROOD YEAR AND AGE CLASS | | | | | | | | | | | | |
| | | 1998 | 1997 | 1996 | 1997 | 1996 | 1995 | 1996 | 1995 | 1994 | 1995 | 1994 | 1993 | 1994 | 1993 |
| | | 0.1 | 1.1 | 2.1 | 0.2 | 1.2 | 2.2 | 0.3 | 1.3 | 2.3 | 0.4 | 1.4 | 2.4 | 0.5 | 1.5 |
| Males | n | | 3 | 2 | | 14 | 4 | | 66 | | | 11 | | | |
| Average length | | | 428 | 434 | | 616 | 679 | | 806 | | | 934 | | | |
| | SD | | 15 | 141 | | 124 | 170 | | 80 | | | 67 | | | |
| | SE | | 9 | 100 | | 33 | 85 | | 10 | | | 20 | | | |
| Females | n | | | | | 4 | | | 62 | 2 | | 11 | | | |
| Average length | | | | | | 567 | | | 775 | 828 | | 834 | | | |
| | SD | | | | | 58 | | | 51 | 47 | | 46 | | | |
| | SE | | | | | 29 | | | 6 | 33 | | 14 | | | |
| Combined | n | | 3 | 2 | | 18 | 4 | | 128 | 2 | | 22 | | | |
| Average length | | | 428 | 434 | | 605 | 679 | | 783 | 828 | | 883 | | | |
| | SD | | 15 | 141 | | 113 | 170 | | 87 | 47 | | 75 | | | |
| | SE | | 9 | 100 | | 27 | 85 | | 8 | 33 | | 16 | | | |

[f] From: Pahlke and Etherton 2001.

| PANEL K. AVERAGE LENGTH OF CHINOOK SALMON IN THE SITUK RIVER IN 2000 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Males | n | 4 | 2 | 4 | 3 | 59 | 7 | 1 | 3 | | |
| Average length | | 351 | 373 | 573 | 678 | 769 | 805 | 810 | 862 | | |
| | SD | 12 | 11 | 68 | 53 | 49 | 21 | | 33 | | |
| | SE | 6 | 8 | 34 | 31 | 6 | 8 | | 19 | | |
| Females | n | | | 3 | | 110 | 8 | | 19 | 1 | |
| Average length | | | | 612 | | 780 | 806 | | 844 | 850 | |
| | SD | | | 28 | | 30 | 44 | | 44 | | |
| | SE | | | 16 | | 3 | 16 | | 10 | | |
| Combined | n | 4 | 2 | 7 | 3 | 169 | 15 | 1 | 22 | 1 | |
| Average length | | 351 | 373 | 589 | 678 | 776 | 805 | 810 | 847 | 850 | |
| | SD | 12 | 11 | 55 | 53 | 38 | 34 | | 43 | | |
| | SE | 6 | 8 | 21 | 31 | 3 | 9 | | 9 | | |

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**SUMMARY. AVERAGE LENGTH OF MALE CHINOOK SALMON SAMPLED IN 11 SOUTHEAST ALASKA RIVERS IN 2000**

| | BROOD YEAR AND AGE CLASS | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1998 | 1997 | 1996 | 1997 | 1996 | 1995 | 1996 | 1995 | 1994 | 1995 | 1994 | 1993 | 1994 | 1993 |
| | 0.1 | 1.1 | 2.1 | 0.2 | 1.2 | 2.2 | 0.3 | 1.3 | 2.3 | 0.4 | 1.4 | 2.4 | 0.5 | 1.5 |
| 1. Keta | | 412 | | 648 | 650 | | 844 | 833 | | | 931 | | | |
| 2. Blossom | | | | | 673 | | | 835 | | | | | | |
| 3. Chickamin | | | | | 667 | | | 793 | | | 930 | | | |
| 4. Unuk | | 370 | | | 642 | | | 789 | | | 910 | | | |
| 5. Stikine | | | | | 628 | | | 778 | | | 889 | | | 912 |
| 6. Andrew Cr | | | | | 590 | | | 739 | | | 846 | | | |
| 7. King Salmon | | | | | 650 | | | 754 | | | | | | |
| 8. Taku | | 349 | | | 584 | | | 754 | | | 876 | | | |
| 9. Chilkat | | 379 | | | 574 | | | 762 | | | 892 | | | |
| 10. Alsek | | | | | 616 | 679 | | 806 | | | 934 | | | |
| 11. Situk | 351 | | | 573 | | | 769 | 805 | | | | | | |

**SUMMARY. AVERAGE LENGTH OF FEMALE CHINOOK SALMON SAMPLED IN 11 SOUTHEAST ALASKA RIVERS IN 2000**

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Keta | | | | 728 | | 852 | 844 | | 907 | 914 | | 960 | | |
| 2. Blossom | | | | | | | 871 | | | 896 | | | | |
| 3. Chickamin | | | | | | | 844 | | | 905 | | | | |
| 4. Unuk | | | | 726 | | | 816 | | | 884 | | | | 975 |
| 5. Stikine | | | | 635 | | | 784 | | | 839 | | | | 870 |
| 6. Andrew Cr | | | | | | | 779 | | | 829 | | | | 935 |
| 7. King Salmon | | | | | | | 787 | | | 817 | | | | |
| 8. Taku | | | | 657 | | | 773 | | | 826 | | | | 895 |
| 9. Chilkat | | | | | | | 795 | | | 858 | | | | |
| 10. Alsek | | | | 567 | | | 775 | | | 834 | | | | |
| 11. Situk | | | | 612 | | | 780 | 806 | | 844 | | | | |

**SUMMARY. AVERAGE LENGTH OF CHINOOK SALMON SAMPLED IN SOUTHEAST ALASKA IN 2000, SEXES COMBINED**

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Keta | | 412 | | 648 | 651 | | 847 | 839 | | 908 | 921 | | | |
| 2. Blossom | | | | | 673 | | | 844 | | | 903 | | | |
| 3. Chickamin | | | | | 667 | | | 820 | | | 914 | | | |
| 4. Unuk | | 370 | | | 644 | | | 800 | | | 892 | | | 963 |
| 5. Stikine | | | | | 629 | | | 781 | | | 858 | 858 | | 896 |
| 6. Andrew Cr | | | | | 606 | | | 760 | | | 833 | | | |
| 7. King Salmon | | | | | 650 | | | 769 | | | 826 | | | |
| 8. Taku | | 349 | | | 586 | | | 764 | | | 845 | | | |
| 9. Chilkat | | 379 | | | 576 | | | 776 | | | 871 | | | 866 |
| 10. Alsek | | | | | 605 | 679 | | 783 | | | 883 | | | |
| 11. Situk | 351 | | | 589 | | | 776 | 805 | | 847 | | | | |
| Averages | | 378 | | | 629 | | | 795 | | | 875 | | | 908 |

Note: age classes with fewer than four fish sampled were not reported in summary panels.

**Appendix A6.–Differences in mean lengths (Panel A) and test results (Z, Panel B) for statistical differences in mean lengths between age-1.2 chinook salmon (sexes combined) sampled in 11 rivers in Southeast Alaska in 2000.**

Panel A

| System | Age class | Average length | SE | Difference in mean length | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Keta | Blossom | Chickamin | Unuk | Stikine | Andrew | King Sal. | Taku | Chilkat | Alsek | Situk |
| 1. Keta | 1.2 | 651 | 4 | 0 | 22 | 16 | -7 | -22 | -45 | -1 | -65 | -75 | -46 | |
| 2. Blossom | 1.2 | 673 | 13 | -22 | 0 | -6 | -29 | -44 | -67 | -23 | -87 | -97 | -68 | |
| 3. Chickamin | 1.2 | 667 | 8 | -16 | 6 | 0 | -23 | -38 | -61 | -17 | -81 | -91 | -62 | |
| 4. Unuk | 1.2 | 644 | 3 | 7 | 29 | 23 | 0 | -15 | -38 | 6 | -58 | -68 | -39 | |
| 5. Stikine | 1.2 | 629 | 6 | 22 | 44 | 38 | 15 | 0 | -23 | 21 | -43 | -53 | -24 | |
| 6. Andrew Cr | 1.2 | 606 | 22 | 45 | 67 | 61 | 38 | 23 | 0 | 44 | -20 | -30 | -1 | |
| 7. King Salm. | 1.2 | 650 | 11 | 1 | 23 | 17 | -6 | -21 | -44 | 0 | -64 | -74 | -45 | |
| 8. Taku | 1.2 | 586 | 4 | 65 | 87 | 81 | 58 | 43 | 20 | 64 | 0 | -10 | 19 | |
| 9. Chilkat | 1.2 | 576 | 5 | 75 | 97 | 91 | 68 | 53 | 30 | 74 | 10 | 0 | 29 | |
| 10. Alsek | 1.2 | 605 | 27 | 46 | 68 | 62 | 39 | 24 | 1 | 45 | -19 | -29 | 0 | |
| 11. Situk | 1.2 | | | | | | | | | | | | | |

Panel B.

| System | Age class | Average length | SE | Test statistics (Z) for differences in mean length | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Keta | Blossom | Chickamin | Unuk | Stikine | Andrew | King Sal. | Taku | Chilkat | Alsek | Situk |
| 1. Keta | 1.2 | 651 | 4 | 0.00 | 1.65 | 1.83 | -1.32 | **-2.99** | **-2.01** | -0.09 | **-10.75** | **-11.17** | -1.71 | |
| 2. Blossom | 1.2 | 673 | 13 | -1.65 | 0.00 | -0.41 | **-2.22** | **-3.14** | **-2.64** | -1.39 | **-6.52** | **-7.08** | **-2.31** | |
| 3. Chickamin | 1.2 | 667 | 8 | -1.83 | 0.41 | 0.00 | **-2.79** | **-3.92** | **-2.62** | -1.30 | **-9.27** | **-9.86** | **-2.24** | |
| 4. Unuk | 1.2 | 644 | 3 | 1.32 | **2.22** | **2.79** | 0.00 | **-2.22** | -1.71 | 0.54 | **-10.95** | **-11.24** | -1.45 | |
| 5. Stikine | 1.2 | 629 | 6 | **2.99** | **3.14** | **3.92** | **2.22** | 0.00 | -1.01 | 1.72 | **-5.84** | **-6.67** | -0.88 | |
| 6. Andrew Cr | 1.2 | 606 | 22 | **2.01** | **2.64** | **2.62** | 1.71 | 1.01 | 0.00 | 1.80 | -0.89 | -1.32 | -0.03 | |
| 7. King Salm. | 1.2 | 650 | 11 | 0.09 | 1.39 | 1.30 | -0.54 | -1.72 | -1.80 | 0.00 | **-5.60** | **-6.26** | -1.57 | |
| 8. Taku | 1.2 | 586 | 4 | **10.75** | **6.52** | **9.27** | **10.95** | **5.84** | 0.89 | **5.60** | 0.00 | -1.46 | 0.70 | |
| 9. Chilkat | 1.2 | 576 | 5 | **11.17** | **7.08** | **9.86** | **11.24** | **6.67** | 1.32 | **6.26** | 1.46 | 0.00 | 1.06 | |
| 10. Alsek | 1.2 | 605 | 27 | 1.71 | **2.31** | **2.24** | 1.45 | 0.88 | 0.03 | 1.57 | -0.70 | -1.06 | 0.00 | |
| 11. Situk | 1.2 | | | | | | | | | | | | | |

**Appendix A7.–Differences in mean lengths (Panel A) and test results (Z, Panel B) for statistical differences in mean lengths between age-1.3 chinook salmon (sexes combined) sampled in 11 rivers in Southeast Alaska in 2000.**

Panel A

| System | Age class | Average length | SE | Difference in mean length | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Keta | Blossom | Chickamin | Unuk | Stikine | Andrew | King Sal. | Taku | Chilkat | Alsek | Situk |
| 1. Keta | 1.3 | 839 | 6 | 0 | 5 | -19 | -39 | -58 | -79 | -70 | -75 | -63 | -56 | 3 |
| 2. Blossom | 1.3 | 844 | 16 | -5 | 0 | -24 | -44 | -63 | -84 | -75 | -80 | -68 | -61 | -7 |
| 3. Chickamin | 1.3 | 820 | 6 | 19 | 24 | 0 | -20 | -39 | -60 | -51 | -56 | -44 | -37 | 3 |
| 4. Unuk | 1.3 | 800 | 3 | 39 | 44 | 20 | 0 | -19 | -40 | -31 | -36 | -24 | -17 | 6 |
| 5. Stikine | 1.3 | 781 | 4 | 58 | 63 | 39 | 19 | 0 | -21 | -12 | -17 | -5 | 2 | 5 |
| 6. Andrew | 1.3 | 760 | 7 | 79 | 84 | 60 | 40 | 21 | 0 | 9 | 4 | 16 | 23 | 2 |
| 7. King Sal. | 1.3 | 769 | 8 | 70 | 75 | 51 | 31 | 12 | -9 | 0 | -5 | 7 | 14 | 1 |
| 8. Taku | 1.3 | 764 | 2 | 75 | 80 | 56 | 36 | 17 | -4 | 5 | 0 | 12 | 19 | 6 |
| 9. Chilkat | 1.3 | 776 | 4 | 63 | 68 | 44 | 24 | 5 | -16 | -7 | -12 | 0 | 7 | 5 |
| 10. Alsek | 1.3 | 783 | 8 | 56 | 61 | 37 | 17 | -2 | -23 | -14 | -19 | -7 | 0 | 1 |
| 11. Situk | 1.3 | 805 | 9 | 34 | 39 | 15 | -5 | -24 | -45 | -36 | -41 | -29 | -22 | 0 |

Panel B

| System | Age class | Average length | SE | Test statistics (Z) for differences in mean length | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Keta | Blossom | Chickamin | Unuk | Stikine | Andrew | King Sal. | Taku | Chilkat | Alsek | Situk |
| 1. Keta | 1.3 | 839 | 6 | 0.00 | 0.30 | **-2.25** | **-6.13** | **-8.31** | **-8.74** | **-7.27** | **-12.11** | **-9.03** | **-5.84** | 0.09 |
| 2. Blossom | 1.3 | 844 | 16 | -0.30 | 0.00 | -1.42 | **-2.75** | **-3.88** | **-4.87** | **-4.27** | **-5.02** | **-4.19** | **-3.48** | -0.20 |
| 3. Chickamin | 1.3 | 820 | 6 | **2.25** | 1.42 | 0.00 | **-2.95** | **-5.29** | **-6.42** | **-5.14** | **-8.45** | **-5.97** | **-3.75** | 0.07 |
| 4. Unuk | 1.3 | 800 | 3 | **6.13** | **2.75** | **2.95** | 0.00 | **-3.90** | **-5.31** | **-3.76** | **-9.86** | **-4.94** | **-2.08** | 0.12 |
| 5. Stikine | 1.3 | 781 | 4 | **8.31** | **3.88** | **5.29** | **3.90** | 0.00 | **-2.60** | -1.38 | **-3.66** | -0.89 | 0.23 | 0.07 |
| 6. Andrew | 1.3 | 760 | 7 | **8.74** | **4.87** | **6.42** | **5.31** | **2.60** | 0.00 | 0.86 | 0.54 | **1.99** | **2.21** | 0.02 |
| 7. King Sal. | 1.3 | 769 | 8 | **7.27** | **4.27** | **5.14** | **3.76** | 1.38 | -0.86 | 0.00 | -0.62 | 0.80 | 1.28 | 0.01 |
| 8. Taku | 1.3 | 764 | 2 | **12.11** | **5.02** | **8.45** | **9.86** | **3.66** | -0.54 | 0.62 | 0.00 | **2.59** | **2.36** | 0.08 |
| 9. Chilkat | 1.3 | 776 | 4 | **9.03** | **4.19** | **5.97** | **4.94** | 0.89 | **-1.99** | -0.80 | **-2.59** | 0.00 | 0.81 | 0.07 |
| 10. Alsek | 1.3 | 783 | 8 | **5.84** | **3.48** | **3.75** | **2.08** | -0.23 | **-2.21** | -1.28 | **-2.36** | -0.81 | 0.00 | 0.02 |
| 11. Situk | 1.3 | 805 | 9 | **3.24** | **2.16** | 1.39 | -0.54 | **-2.48** | **-4.00** | **-3.07** | **-4.50** | **-3.00** | -1.88 | 0.00 |

**Appendix A8.–Differences in mean lengths (Panel A) and test results (Z, Panel B) for statistical differences in mean lengths between age-1.4 chinook salmon (sexes combined) sampled in 11 rivers in Southeast Alaska in 2000.**

Panel A

| System | Age class | Average length | SE | Difference in mean length | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Keta | Blossom | Chickamin | Unuk | Stikine | Andrew | King Sal | Taku | Chilkat | Alsek | Situk |
| 1. Keta | 1.4 | 921 | 8 | 0 | -18 | -7 | -29 | -63 | -88 | -95 | -76 | -50 | -38 | |
| 2. Blossom | 1.4 | 903 | 18 | 18 | 0 | 11 | -11 | -45 | -70 | -77 | -58 | -32 | -20 | |
| 3. Chickamin | 1.4 | 914 | 8 | 7 | -11 | 0 | -22 | -56 | -81 | -88 | -69 | -43 | -31 | |
| 4. Unuk | 1.4 | 892 | 4 | 29 | 11 | 22 | 0 | -34 | -59 | -66 | -47 | -21 | -9 | |
| 5. Stikine | 1.4 | 858 | 2 | 63 | 45 | 56 | 34 | 0 | -25 | -32 | -13 | 13 | 25 | |
| 6. Andrew Cr | 1.4 | 833 | 6 | 88 | 70 | 81 | 59 | 25 | 0 | -7 | 12 | 38 | 50 | |
| 7. King Sal. | 1.4 | 826 | 15 | 95 | 77 | 88 | 66 | 32 | 7 | 0 | 19 | 45 | 57 | |
| 8. Taku | 1.4 | 845 | 4 | 76 | 58 | 69 | 47 | 13 | -12 | -19 | 0 | 26 | 38 | |
| 9. Chilkat | 1.4 | 871 | 5 | 50 | 32 | 43 | 21 | -13 | -38 | -45 | -26 | 0 | 12 | |
| 10. Alsek | 1.4 | 883 | 16 | 38 | 20 | 31 | 9 | -25 | -50 | -57 | -38 | -12 | 0 | |
| 11. Situk | 1.4 | | | | | | | | | | | | | |

Panel B

| System | Age class | Average length | SE | Test statistics for differences in mean length | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Keta | Blossom | Chickamin | Unuk | Stikine | Andrew | King Sal | Taku | Chilkat | Alsek | Situk |
| 1. Keta | 1.4 | 921 | 8 | 0.00 | -0.89 | -0.62 | **-3.14** | **-7.34** | **-8.56** | **-5.62** | **-8.31** | **-5.12** | **-2.11** | |
| 2. Blossom | 1.4 | 903 | 18 | 0.89 | 0.00 | 0.55 | -0.59 | **-2.43** | **-3.62** | **-3.27** | **-3.09** | -1.68 | -0.82 | |
| 3. Chickamin | 1.4 | 914 | 8 | 0.62 | -0.55 | 0.00 | **-2.54** | **-7.01** | **-8.28** | **-5.30** | **-8.03** | **-4.65** | -1.75 | |
| 4. Unuk | 1.4 | 892 | 4 | **3.14** | 0.59 | **2.54** | 0.00 | **-7.71** | **-8.23** | **-4.34** | **-8.66** | **-3.26** | -0.55 | |
| 5. Stikine | 1.4 | 858 | 2 | **7.34** | **2.43** | **7.01** | **7.71** | 0.00 | **-3.95** | **-2.16** | **-3.06** | **2.38** | 1.55 | |
| 6. Andrew Cr | 1.4 | 833 | 6 | **8.56** | **3.62** | **8.28** | **8.23** | **3.95** | 0.00 | -0.44 | 1.70 | **4.83** | **2.93** | |
| 7. King Sal. | 1.4 | 826 | 15 | **5.62** | **3.27** | **5.30** | **4.34** | **2.16** | 0.44 | 0.00 | 1.25 | **2.89** | **2.62** | |
| 8. Taku | 1.4 | 845 | 4 | **8.31** | **3.09** | **8.03** | **8.66** | **3.06** | -1.70 | -1.25 | 0.00 | **4.11** | **2.31** | |
| 9. Chilkat | 1.4 | 871 | 5 | **5.12** | 1.68 | **4.65** | **3.26** | **-2.38** | **-4.83** | **-2.89** | **-4.11** | 0.00 | 0.72 | |
| 10. Alsek | 1.4 | 883 | 16 | **2.11** | 0.82 | 1.75 | 0.55 | -1.55 | **-2.93** | **-2.62** | **-2.31** | -0.72 | 0.00 | |
| 11. Situk | 1.4 | | | | | | | | | | | | | |

**Appendix A9.–Computer files used to complete this report.**

| File Name | Description |
|---|---|
| TOTALCHTS.XLW | Excel workbook with tables and charts with annual counts for each index area. |
| | |
| SUMVER00.XLS | Appendix table A2, with expanded escapement totals for Southeast Alaska |
| | |
| ESC00.XLS | Table 1. Estimated chinook escapement in 2000. |
| | |
| GOALS.XLS | Appendix Table A1. Expanded goals for Southeast Alaska. |
| | |
| AGELENGTHSEAK2000.XLS | Appendix Table A4-A7. Length and age summaries for 2000. |