

AGE, SEX, AND SIZE OF YUKON RIVER SALMON
CATCHES AND ESCAPEMENTS, 1993

By

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ABSTRACT

Catch statistics, escapement estimates, and age, sex, and length data for chinook *Oncorhynchus tshawytscha* (Walbaum), summer and fall chum *O. keta* (Walbaum), and coho *O. kisutch* (Walbaum) salmon catches and escapements for the Yukon River in 1993 were summarized. The total harvest (Alaska and Canada combined) was 536,198 salmon. Approximately 48% of the catch was taken commercially with gillnets and fish wheels. Subsistence gillnet and fish wheel catches comprised 52% of the salmon harvest. Catches of summer chum salmon comprised 46% of the salmon harvest. Chinook salmon age composition was normal with age 1.4 contributing 50% of the catch. Summer chum salmon catch had nearly even distribution, between age 0.4 (48%) and age 0.3 (47%), in age composition. Fall chum salmon escapement samples ranged from 55% to 64% age 0.3, and from 30% to 42% age 0.4. Age 2.1 dominated coho salmon test net catch samples (84%).

KEY WORDS: Yukon, chinook, chum, coho, age, catch, escapement, *Oncorhynchus*, *tshawytscha*, *keta*, *kisutch*

INTRODUCTION

The Yukon Area includes all waters of the Yukon River drainage in Alaska (Figure 1) and coastal waters from Canal Point light, near Cape Stephens, southward to Naskonat Peninsula (Bergstrom et al. 1992). The Alaska portion of the river is divided for regulatory purposes into six fishing districts, e.g., Districts 1 - 6. There are also fisheries in the Canadian portion of the Yukon River drainage (Figure 2).

When referring to harvests, Districts 1, 2, and 3 are termed Lower Yukon while Districts 4, 5, and 6 are termed Upper Yukon. Fisheries in Canada are referred to in context. However, references to spawning escapements, particularly for chinook salmon, usually follow conventions established through Yukon River chinook salmon stock identification studies. Scale pattern analysis of Yukon River chinook salmon has provided a basis for use of the terms Lower, Middle, and Upper Run, to refer respectively to stocks originating in tributaries downriver from the Village of Koyukuk (including lower Koyukuk River tributaries), between Koyukuk and the U.S.-Canada border (including upper Koyukuk River tributaries), and upriver from the border (Schneiderhan 1994b).

The Yukon River drainage supports major stocks of chinook salmon *Oncorhynchus tshawytscha* (Walbaum), summer and fall chum salmon *O. keta* (Walbaum), and coho salmon *O. kisutch* (Walbaum). These species contribute to commercial and subsistence fisheries throughout the Yukon River drainage. Pink salmon, *O. gorbuscha* (Walbaum) and sockeye salmon *O. nerka* (Walbaum) are also indigenous to the drainage. Pink salmon return to lower drainage tributaries and are stronger in even-numbered years, while sockeye salmon are rarely documented. Neither species is harvested by commercial or subsistence fishermen to any significant extent. Summer chum salmon are distinguished from fall chum salmon by their earlier entry timing into the Yukon River (early June to mid-July), smaller size, lower oil content, and a spawning distribution in the lower and middle portion of the Yukon River drainage. Fall chum salmon enter the Yukon River from mid-July to early September and spawn primarily in the upper portion of the drainage.

Commercial fishing occurs throughout the mainstem Yukon River and in the lower 360 km (225 mi) of the Tanana River. Most of the commercial harvest is taken in Districts 1 and 2. Set and drift gillnets are the legal gear in the Lower Yukon, while only set gillnets and fish wheels are allowed in the Upper Yukon. Chinook and fall chum salmon are also commercially harvested in a predominantly gillnet fishery near Dawson, Yukon Territory (Figure 2), although some fish wheels are also used.

Subsistence fishing is allowed throughout the drainage with most of the effort concentrated in the mainstem Yukon River. In Canada the Aboriginal Fishery (Wilson 1994) and the domestic fishery are subsistence type fisheries. The Yukon Area Annual Management Report, 1991 (Bergstrom et al. 1992) includes a complete description of the Yukon Area and its fisheries.

Most commercial fishing occurs in the lower 320 km (200 mi) of the river, where the harvest consists of mixed species and stocks of salmon bound for spawning areas throughout the Yukon River drainage. The Alaska Department of Fish and Game (ADF&G), Department of Fisheries and Oceans, Canada (DFO), and other government agencies and regional organizations conduct a variety of programs that supply information used to manage and document Yukon River fisheries resources. These programs include: (1) documentation of the catch in each fishery; (2) catch sampling for age, sex, and length data; (3) assessing the magnitude of spawning escapements by aerial and ground surveys, hydroacoustic counters, weirs, towers, tagging studies, and the Whitehorse fishpass; and (4) sampling major spawning escapements for age, sex, and length data. Hydroacoustic equipment is used by ADF&G to estimate salmon populations in the mainstem Yukon River near Pilot Station, and a feasibility study is being conducted to determine if hydroacoustic techniques can be applied near the U.S.-Canada border at Eagle, Alaska. DFO uses tag and recapture methods near the U.S.-Canada border to estimate border escapement of chinook and fall chum salmon.

Between 1969 and 1981 Yukon River salmon age, sex, and size sample data summaries were annually reported in the ADF&G Arctic-Yukon-Kuskokwim Region Age, Sex, and Size Composition of Salmon Report Series. Since 1982 the composition of Yukon River salmon catches and escapements by age, sex, and size have been reported by McBride, Hamner, and Buklis (1983), by Buklis and Wilcock (1984, 1985, and 1986), by Buklis (1987), by Wilcock (1989), by Wilcock and Schneiderhan (1990), and by Schneiderhan (1994a and 1994c).

The purpose of this report is to present all 1993 Yukon River drainage salmon catches and escapements and to relate them to age, sex, and length (ASL) data wherever appropriate. This report summarizes Yukon River salmon commercial and subsistence harvests in numbers of fish by age and sex for each fishing district, where possible. Percent age composition is presented for sampled escapements as well as for commercial and subsistence harvests.

As previously mentioned, a multifaceted stock analysis of Yukon River chinook salmon is performed annually to assign chinook harvests to three runs of origin, e.g., Lower Yukon Run, Middle Yukon Run, and Upper Yukon Run. The stock analysis is partially based on chinook data also presented in this report; however, in the stock identification analytic process, somewhat different age compositions are obtained through a thorough treatment of district and drainage-wide stock composition data which includes scale pattern analysis, age composition ratio analysis, and geographic analysis. A complete treatment of the chinook stock analysis for 1993 may be found in Schneiderhan (1994b).

METHODS

Quantifying Catch and Escapement

Harvest and escapement enumeration data presented in this report were obtained from the 1993 AMR (Bergstrom et. al. *In prep*).

Subsistence

Drainage-wide subsistence harvests were primarily determined through mail-out catch calendars and household interviews. For the purposes of this report, personal use fisheries were included in the subsistence harvest. The primary gear used to harvest subsistence fish in Districts 1, 2, and 3 was gillnets. Subsistence harvests by other gear types were negligible. Therefore, the subsistence age and sex composition was assumed to be the same as the age and sex composition from the appropriate commercial fishery. In cases where commercial fishing was suspended for fall chum and coho salmon, test fishing catch samples were used to characterize subsistence harvests. Usage patterns and differential catch ratios of subsistence gear types used to harvest salmon were not fully documented for the Upper Yukon Area, e.g., Districts 4-6. Gillnets and fish wheels were used, but because of inadequate gear survey information, subsistence catches by gear type were estimated using the proportion of commercial harvest by gear type for each district, or the neighboring district where appropriate. Since no commercial fall fishery occurred in Districts 4-6, and there were no subsistence fishery or test fishery samples collected that could reasonably be applied, age and sex composition could not be estimated for fall chum and coho subsistence harvests in Districts 4-6.

Salmon sport fishing harvests are very small in the Yukon River drainage relative to commercial and subsistence harvests. Estimates of sport fishing harvests in 1993 for the Alaska portion of the Yukon River drainage were obtained from Mills (1994). Sport fish harvest estimates for 1993 in Alaska and Canada were listed separately.

All Yukon Territory catch data were obtained from DFO as reported in the November 1993, and December 1994, United States/Canada Yukon River Joint Technical Committee reports (JTC 1993 and 1994), and from updated verbal reports (I. Boyce, Department of Fisheries and Oceans, Canada, Whitehorse, personal communication). No data was available concerning 1993 Canadian harvest proportions by gillnet and fish wheel gear types; however, a subjective estimate assigns a small portion of the 1993 chinook harvest and more than 30% of the mainstem Yukon River fall chum commercial harvest to fish wheel gear (JTC 1993). For purposes of this report, the Canadian chinook harvest is attributed to gillnets while the mainstem Yukon River fall chum harvest is assigned 70% to gillnets and 30% to fish wheels.

Commercial

Alaskan commercial catch data were compiled by the Commercial Fisheries Management and Development Division for each management district and were based on computer tabulations of harvest receipts (fish tickets) which documented the volume of sales from fishers to processors. Commercial harvests in districts where ADF&G operated test fishing projects include district test fishing harvests which were sold to processors by project personnel on behalf of the Department (Bergstrom et. al. *In prep*). The District 4 summer chum salmon commercial catch included an estimate of unsold males that were a byproduct of the commercial summer chum salmon roe fishery in the district. It was assumed that most of these fish were used for subsistence purposes.

District 1 commercial catch samples were obtained from fish at the time of delivery, or shortly thereafter, to local fish processors. District 1 sample age and sex compositions were used to apportion the commercial harvest separately by period. A summation of fish by age and sex from each period also provided a combined season age and sex composition which is weighted by period harvest.

District 2 commercial catch samples were obtained in commercial periods from fish delivered to processors in the district. Some District 2 samples were obtained in District 1 from processor fish tenders which bought fish exclusively in District 2 and delivered them for processing in District 1. District 3 harvests were not sampled except inadvertently in District 2 where District 3 fish were sometimes delivered for sale. The District 3 season harvest was assumed to have the same age and sex composition as that used for the District 2 season harvest.

Districts 4 and 5 commercial catch samples were obtained from fish wheel and gillnet catches. Estimated subsistence harvests in those districts combined with the commercial harvests were apportioned by gear type based upon commercial samples. In District 6 commercial, subsistence, and test fish catch samples were obtained from fish caught by fish wheels. Catches from fish wheels were apportioned using the resulting sample age and sex composition.

The estimated number of male and female summer chum salmon harvested in the District 4, 5, and 6 roe fisheries has been termed "commercially related". The estimated District 4 commercially related harvest was calculated by dividing the harvested roe weight by pounds of roe per female to yield the number of females. The number of females was then divided by the estimated percentage of females in the catch to yield the estimated total commercially related harvest. In Subdistrict 4C one fisher's catch, sold in the round, was added to the estimated harvest. There were no roe sales in District 5. In District 6 the estimated harvest was the number of fish sold in the round plus the estimated females harvested to produce the roe sold. To estimate harvests from roe sold, in Districts 4 and 6, the average number of pounds of roe per female and the percentage of females were obtained from catch samples during each fishing period (Bergstrom et. al. *In prep*).

No Canadian commercial catch samples were taken. Fall chum salmon fish wheel catches were apportioned using the resulting age composition from DFO test fish wheels.

Escapement

Most escapement data were peak aerial survey estimates for selected spawning streams. An effort was made to survey the major spawning populations and these indices of relative abundance were assumed to represent overall trends in escapement. Additional escapement estimates were obtained by other methods as follows:

1. Summer chum salmon escapement to the Anvik River (Sandone 1994) and fall chum salmon escapement to the Sheenjek River (Barton 1994) were estimated by ADF&G using side scan sonar counters.
2. Fall chum salmon escapement to the Fishing Branch River in Canada was enumerated by DFO using a weir (JTC 1993).
3. Students hired by DFO and working for the private Yukon Fish and Game Association counted chinook salmon which were observed ascending the fishway at Whitehorse Dam in Yukon Territory, Canada (JTC 1993).
4. Fall chum salmon escapement to the Toklat and Delta Rivers was estimated by ADF&G from ground surveys and stream residency time expansion factors (Bergstrom et. al. *In prep*).
5. A hydroacoustic counting site was operated by ADF&G on the mainstem Yukon River at river mile 123 to obtain total salmon population estimates by species (S. Fleischman, Alaska Department of Fish and Game, Anchorage, personal communication).
6. Counting towers were used by ADF&G on the Chena and Salcha Rivers to obtain spawning escapement estimates of chinook and summer chum salmon (Skaugstad 1994).
7. A 4-H educational program provided funding and supervision of students for a counting tower on the Kaltag River (Bergstrom et. al. *In prep*).
8. A chinook and fall chum salmon tag and recapture study was conducted by DFO immediately upstream from the U.S.-Canada border to obtain population estimates for the Canadian portion of the drainage, excluding the Porcupine River (JTC 1993).

Indices of relative abundance were presented for selected tributaries with accompanying age and sex summaries where available. Other major spawning escapements without estimates of relative abundance were treated similarly. Mean length by age and sex for each sampled fishery and escapement were also tabulated. These data constitute the primary biological

information necessary to manage Yukon River salmon fishery harvests and monitor the status of spawning stocks.

Age, Sex, and Length Determination

A stratified systematic sampling design (Cochran 1977) was used to obtain samples for the estimation of age and sex composition. Strata were defined as individual fishing periods for Districts 1 and 2. For the other districts and fisheries, time strata were of variable length depending on the number of samples collected. An attempt was made to sample sufficient numbers of fish within each strata to estimate the proportion of each major age class in the catch with $\alpha = 0.05$ and $d = 0.1$ (Bromaghin 1993).

Age compositions and associated variances were estimated with procedures outlined by Cochran (1977) for stratified sampling designs:

$$C_{tj} = C_t P_{tj},$$

$$V[C_{tj}] = \frac{(C_t)^2 P_{tj} (1 - P_{tj})}{N_t - 1}; \text{ and}$$

$$C_{.j} = \sum_{t=1}^T C_{tj},$$

$$V[C_{.j}] = \sum_{t=1}^T V[C_{tj}]$$

where

- C_t = number of fish caught in stratum t ,
- P_{tj} = proportion of sample in stratum t of age j ,
- N_t = number of samples during stratum t ,
- C_{tj} = estimated number of fish of age j in stratum t ,
- T = total number of strata, and
- $C_{.j}$ = estimated number of fish of age j for all strata, e.g., season, T .

If strata sample sizes were insufficient to attain the desired levels of precision and accuracy, the samples were pooled into a single strata for a fishery or escapement to estimate age and sex composition. While commercial and subsistence harvest estimates were categorized by age and sex, escapement sample data was simply presented along with escapement estimates where available.

Lengths were measured from mid-orbit to fork-of-tail to the nearest 5 millimeters. Average lengths, by age and sex, were reported for each sampled fishery and escapement. Length data were not stratified.

Subsistence

ASL data were not taken from subsistence harvests, except from the fish wheel catch in District 6. Estimates of ASL statistics for other subsistence harvests were derived from commercial sample data from the same gear type in the same or a neighboring district. For subsistence harvests where no commercial fishery occurred, e.g., fall chum and coho salmon harvests or test fishing catch sample data were used where appropriate.

Commercial

Examination, measurement, and scale specimen analysis for ASL determination was completed on each fish in samples selected from each strata of interest, e.g., period, district, or season. Examination of scale annuli patterns as described in Gilbert (1922) provided age information for salmon in the catch and escapement. Scales were taken from the left side of the fish approximately two rows above the lateral line along the diagonal from the posterior insertion of the dorsal fin to the anterior insertion of the anal fin according to methods outlined by INPFC (1963). Scales were mounted on gum cards and permanent impressions made in cellulose acetate (Clutter and Whitesel 1956).

Sex determination was made for every sampled fish. Assignment of sex was principally determined through examination of external secondary sexual characteristics. Fish from District 1 harvests often did not exhibit well developed external sexual dimorphism. Occasional examination of the gonads of fish of uncertain sex were made to check the accuracy of sex determination.

An attempt was made to sample fish from the commercial catch for each gear type in each district. However, because of the logistics involved in sampling such widely dispersed fisheries, many of the smaller harvests were not sampled. The majority of the commercial catch samples were collected in Districts 1, 2, 4, and 6.

Escapement

An attempt was made to sample the major chinook and chum salmon spawning populations. In Canada chinook and fall chum salmon were sampled at test fish wheels located near the U.S.-Canada border. Most escapement data elsewhere were collected from carcasses, although live chum salmon were captured with beach seines at the Andraefsky, Anvik, and Sheenjok Rivers. Fish spears were also used to capture live, but spawned out, chinook salmon at most locations.

Resorption of the margins of scales from fall chum salmon on the spawning grounds made correct age determination problematic. Therefore, vertebrae specimens were used as an alternate source of age information for several of the escapement samples. Ages were determined from vertebrae through examination of annuli patterns visible on transverse sections. Ages from scales and vertebrae were recorded in European notation.

RESULTS

Catches and Escapements

Subsistence

The Yukon River subsistence harvest for Alaska and Canada totalled 71,661 chinook, 106,054 summer chum, 83,416 fall chum, and 15,832 coho salmon in 1993 (Table 1). The chinook subsistence harvest was the largest on record. The chinook harvest was 37% above the 1992 harvest of 52,352 fish and 28% above the recent 5-year, 1988-1992, average of 55,966 fish. The greater chinook harvest was due to an increased harvest of approximately 20,000 fish in Districts 1-6 from the previous year. The summer chum subsistence harvest was one of the lowest on record because of poor returns. The summer chum harvest was 15% below the 1992 harvest of 125,497 fish and 27% below the 1988-1992 average of 145,865 fish. The fall chum subsistence harvest was 22% below the 1992 harvest of 107,557 fish and 49% below the 1988-1992 average of 163,345 fish. The coho subsistence harvest was 70% below the 1992 harvest of 52,416 fish and 68% below the 1988-1992 average of 50,029 fish. The large decrease in the fall chum and coho subsistence harvests were due to poor returns and subsistence closures.

During 1993, the largest chinook, fall chum, and coho subsistence harvests occurred in District 5, and the largest subsistence summer chum harvest occurred in District 1. Gillnets accounted for the majority of the chinook and summer chum subsistence harvests. The fall chum and coho subsistence harvests were not segregated by gear type in Districts 4-6, but

the majority were believed to be harvested in fish wheels, while the all fall chum and coho subsistence harvests in Districts 1-3 were assigned to gillnets.

Sport fish harvest for the Alaska portion of the Yukon River drainage was 1,695 chinook, 564 chum, and 897 coho salmon (Mills 1994). The sport fish harvest was not segregated by summer and fall chum and for this report the sport fish chum harvest was designated as summer chum salmon. Canada sport fish harvest was estimated at 300 chinook salmon (JTC 1993).

Commercial

Combined Alaska and Canada commercial harvests, including sales of ADF&G test fishing catches, totalled 106,032 chinook, 141,985 summer chum, and 7,762 fall chum salmon in 1993 (Table 1). No coho salmon were commercially harvested. The fall chum salmon commercial harvest occurred entirely in Canada.

The total chinook commercial harvest was 20% below the 1992 harvest of 133,010 fish, and was 10% below the recent 5-year, 1988-92, average of 117,999 fish. The decrease in the chinook commercial harvest from 1992 was largely due a reduced harvest of approximately 25,000 fish in Districts 1-3. The summer chum harvest was 74% below the 1992 harvest of 545,544 fish, and 85% below the recent 5-year average of 963,327 fish. The large decrease in the summer chum salmon commercial harvest was a result of poor returns and reduced fishing time. The fall chum harvest was 80% below the 1992 harvest of 39,005 fish and 96% below the recent 5-year average of 202,690 fish. No fall chum or coho salmon commercial fishing periods were allowed in the Alaska portion of the drainage due to poor returns.

Fishers in the Alaska portion of the drainage received an estimated 5.4 million dollars for their catch in 1993, approximately 47% below the 1988-92 average (JTC 1993). The largest commercial harvests of chinook and summer chum salmon occurred in District 1. Commercial harvest by species by period and fishing effort by period is presented in Appendix A for each district and Canada. Gillnets accounted for the majority of the commercial harvest (Appendix B).

Escapements

Interim escapement goals have been established by ADF&G for several Yukon River salmon spawning streams or areas (Bergstrom et. al. *In prep*). Most escapement objectives are based on historical aerial survey indices of abundance, and are subject to reevaluation as more data becomes available. Yukon River salmon spawning escapement index counts and population estimates for all areas monitored in 1993 were presented in Table 2. Daily sonar, weir, tower, and fishpass salmon escapement counts were tabulated in Appendix C. In general, observation conditions were fair to good in 1993 for aerial surveys conducted in

the Alaska portion of the Yukon River drainage, while conditions were good for surveys completed in the Canadian portion of the drainage.

Chinook. Chinook salmon spawn in tributary streams throughout the Yukon River drainage (Figure 3). Chinook salmon minimum escapement objectives have been established for the East Fork Andreafsky (1,500), West Fork Andreafsky (1,400), Anvik index area (500), North Fork Nulato (800), South Fork Nulato (500), Gisasa (600), Chena (1,700), and Salcha (2,500) Rivers (Bergstrom et. al. *In prep*). Escapement objectives were achieved for all streams in the lower portion of the drainage for which objectives have been established. In addition to aerial counts, total 1993 spawning populations to the Chena (12,241) and Salcha (10,007) Rivers were estimated by "tower counts" from the Moose Creek Dam on the Chena River and from the Richardson Highway Bridge on the Salcha River.

Chinook salmon escapement in Canada, which is the estimated border escapement minus the Canadian catch, was 28,558 fish, and was the third highest since inception of the tagging program in 1982. However, numerous index tributary escapements were below 1992 escapements, and the recent 5-year, 1988-92, average. The Whitehorse fishway count of 668 chinook salmon was the lowest since 1989. The Big Salmon River (572) and Little Salmon River (184) escapements were the lowest recorded since 1986 and 1983, respectively, for these streams.

Summer Chum. Summer chum salmon spawn primarily in tributaries of the lower Yukon, the Koyukuk, and the Tanana Rivers (Figure 4). Minimum aerial index escapement objectives have been established for the East Fork Andreafsky (109,000), West Fork Andreafsky (116,000), Anvik (356,000), North Fork Nulato (53,000), Hogatza (17,000), and Salcha (3,500) Rivers. A sonar-based minimum escapement objective of 500,000 salmon has also been established for the Anvik River (Bergstrom et. al. *In prep*). With the exception of the Anvik River, escapements were very poor throughout the drainage in 1993. The aerial survey counts for the Andreafsky Rivers were 10,935 summer chum salmon on the East Fork and 9,111 on the West Fork. Although the survey was flown prior to peak of spawning, the escapement estimates were well below the minimum goals. The Anvik River sonar escapement count of 517,409 summer chum salmon was 3% above the escapement objective of 500,000, but was 33% below the estimated 1992 escapement of 775,626. Aerial survey counts for the North Fork Nulato River (7,762) and the Salcha River (212) were also well below minimum objective levels. Abundance estimates from tower counts were 5,809 summer chum salmon for the Salcha River and 5,400 for the Chena River.

Fall chum. Spring fed upwelling areas in streams and sloughs in the upper portion of the Yukon River drainage are preferred spawning areas for fall chum salmon (Figure 5). Minimum total season escapement objectives have been established for the Sheenjek (64,000), Toklat (33,000), and Delta (11,000) Rivers (Bergstrom et. al. *In prep*). The JTC (1993) has recommended long-term escapement goals of greater than 80,000 fall chum for the mainstem Yukon River drainage in Canada, and 50,000-120,000 for the Fishing Branch River.

With the exception of Delta River no interim escapement objectives were met in 1993. Escapement population estimates of 28,171 fall chum salmon for the Toklat River, 19,857 for the Delta River, and 42,922 for the Sheenjek River in 1993 were 15% below, 81% above, and 33% below, respectively, the minimum escapement objectives for each of these streams. The escapement population estimate of 28,798 for the Fishing Branch River was 42% below the established minimum objective.

The DFO spawning escapement estimate was 29,743 fall chum salmon for the mainstem Yukon River drainage in Canada, excluding the Porcupine River drainage. This was the lowest estimate since the inception of the mark-recapture program in 1982. This estimate was 39% below the 1992 estimate of 49,082 fish, and 41% below the recent 5-year, 1988-1992, average of 50,367 fish.

Coho. Coho salmon spawning occurs widely throughout the Yukon River drainage, however most information is available for the Tanana River drainage (Figure 6). Coho escapement counts are generally obtained in conjunction with fall chum escapement surveys; therefore, a comprehensive data base does not exist. The only minimum escapement objective established for coho salmon thus far is 9,000 fish for the Delta Clearwater River (Bergstrom et. al. *In prep*).

Coho escapements in 1993 ranged from good to poor and thus made an overall assessment difficult. Escapement to the Delta Clearwater River (10,875) was 173% above the 1992 escapement estimate of 3,983 fish, but 21% below the recent 5-year, 1988-1992, average of 13,762 fish. The estimate of 3,525 coho salmon observed in the outlet to Clearwater Lake was the second highest estimate on record for that area. The Pilot Station sonar project estimate (40,500) through the end of August was the lowest sonar passage estimate on record through that date. Surveys in other portions of the Tanana River drainage appeared to be below average (Bergstrom et. al. *In prep*).

Age, Sex, and Length Composition

Chinook

Age composition of the Yukon River harvest of chinook salmon in 1993 was estimated to be 50% age 1.4, 25% age 1.3, 16% age 1.2, and 7% age 1.5, with several other age classes present in smaller proportions. Age and sex composition for 89% of the total drainage chinook harvest was estimated (Table 3, Appendix D). Females accounted for an estimated 41% of the total river harvest. In 1993 a more normal age class distribution was observed than in 1992 when age-1.4 fish accounted for 68% of the harvest.

Districts 1 and 2 combined commercial and subsistence gillnet catches comprised 61% of the total river harvest. Age and sex composition differed between periods where

unrestricted mesh size was allowed and the one period where mesh size was restricted to 6-in (15.2 cm) maximum in District 1 (Appendix D). The percentage of females caught during unrestricted mesh periods in both districts ranged from 39% to 60% with an average of 46% for combined unrestricted gear. The percentage of females landed during one period of restricted mesh fishing in District 1 was 37%. There were no mesh size restricted periods in District 2. Age-1.4 fish, which have comprised 48% to 73% of District 1 and 2 harvests in recent years, were the most abundant age group, and comprised 62% and 59% of the season harvest for each district, respectively. The percentage of age-1.4 fish taken in restricted mesh size gear was 42% in District 1, and ranged from 51% to 70% in unrestricted periods. In District 2 the percentage of age-1.4 fish ranged from 49% to 70%. There was no noticeable increase in contribution of age-1.5 chinook salmon in Districts 1 or 2. An increase may have been expected because of a greater than normal abundance of 1986 brood year returns in recent years. Age-1.2 and -1.3 fish were in higher proportion in Districts 1 and 2 as compared to 1992 (nonstatistical comparison, NSC).

Subsistence harvests in Districts 1, 2, and 3 were not sampled. Because subsistence fisheries in those locations utilize the same gear types, but occur mostly before the commercial fisheries, age and sex frequencies of samples from the first commercial periods in Districts 1 and 2 were applied to the subsistence harvests (Appendix D). Because of the intermixing of commercial and subsistence gillnet and fish wheel catches by fishermen in Districts 4, 5, and 6, estimates by gear type were made only when segregated samples were available.

In Districts 4 and 5 different age and sex compositions were obtained from gillnet and fish wheel catch samples. A chi-squared test for independence showed that relative proportions of age-1.2, -1.3, and -1.4 fish changed with gear type in a statistically significant manner (χ^2 , $P < 0.0001$). District 4 fish wheel samples were 56% age 1.2, 29% age 1.3, and 12% age 1.4, while gillnet samples were composed of no age 1.2, 20% age 1.3, and 73% age 1.4. Likewise, District 5 fish wheel samples were 52% age 1.2, 31% age 1.3, and 12% age 1.4, while gillnet samples were 6% age 1.2, 30% age 1.3, 57% age 1.4. The District 4 fish wheel catch sample was 89% male while the gillnet catch sample was 57% male, and the District 5 fish wheel catch sample was 86% male while the gillnet catch sample was 54% male. Similar trends were seen in the District 6 fish wheel catch samples with 55% age 1.2, 25% age 1.3, and 17% age 1.4, and an overall catch sample of 84% male. No commercial or subsistence harvests were sampled in Canada.

Mean size of male chinook salmon in the District 1 and 2 commercial gillnet catch ranged from 455 mm for a single age-1.1 fish to 1,003 mm for an age-1.5 fish. Female chinook salmon ranged from 573 mm for an age-1.2 fish to 941 mm for an age-1.5 fish (Table 4). The largest mean size of male chinook was 1,022 mm for an age-1.5 fish from the District 5 gillnet catch. The size of male chinook salmon in the combined District 6 commercial and subsistence fish wheel catch ranged from 441 mm for age-1.1 fish to 848 mm for age-1.5 fish; females ranged from 605 mm for a single age-1.2 fish to 995 mm for a single age-1.5 fish. Other catch samples exhibited size frequencies within the range of the above samples.

Age, sex, and size composition of chinook test fishing catch samples collected in 1993 was presented in Appendix D.13.

Samples were collected from chinook salmon in tributaries of the Lower and Middle Yukon River. Age and sex composition of the chinook escapements (Table 5) indicate that age-1.4 fish were more abundant in lower Yukon River spawning locations than in middle Yukon River spawning locations. Age-1.4 fish ranged from 42% for the East Fork Andreafsky River to 59% for the West Fork Andreafsky River. Age 1.3 was next most abundant ranging from 26% for the West Fork Andreafsky River to 39% for the East Fork Andreafsky River. Age-1.2 fish ranged from 14% on both the Anvik and West Fork Andreafsky Rivers to 17% on the East Fork Andreafsky River. Other age classes contributed less than 5% to the lower Yukon River tributaries sampled. For middle Yukon River escapements age-1.3 fish were most abundant and ranged from 39% for the Salcha River to 41% for the Chena River. The abundances of age-1.2 and -1.4 fish were approximately equal on both rivers. For the Chena River age 1.2 was 29% and age 1.4 was 28% while for the Salcha River age 1.2 was 28% and age 1.4 was 31%. Other age classes contributed less than 2% to the middle Yukon River tributaries sampled.

Escapement samples were not taken in the Canadian portion of the drainage. Unlike middle Yukon River fish wheel harvests, age composition for the DFO fish wheels was more evenly distributed with 32% age 1.2, 35% age 1.3, and 28% age 1.4. Other age classes contributed less than 4% to the age composition. In previous years, e.g., 1991 and 1992, DFO test fish wheel age composition closely approximated middle Yukon River fish wheel harvests (NSC).

The contribution of female chinook salmon in Yukon River escapement samples varied from 17% in the Chena River to 44% in the West Fork Andreafsky River. However, the carcass sample from the Chena River may have been biased by high water levels as larger numbers of female carcasses often are retrieved from deeper areas of the stream which become obscured by turbidity during times of high water.

The average size of male chinook salmon in Yukon River escapements ranged from 420 mm for a single age-1.1 fish from the East Fork Andreafsky River to 988 mm for an age-1.5 fish from the same river (Table 6). Average size of females ranged from 660 mm for a single age-1.3 fish from the Salcha River to 945 mm for a single age-1.5 fish from the Chena River.

Summer Chum

Sample sizes of summer chum salmon from Districts 1 and 2 commercial gillnet fishery, and Districts 4 and 6 combined commercial and subsistence fish wheel fisheries were sufficient ($\alpha = 0.05$ and $d = 0.1$) to permit estimates of harvest by age and sex. Harvest estimates for District 3 commercial gillnet fishery, by age and sex, were based on the composition of District 2 harvest. Age and sex composition estimates for commercial and subsistence

gillnet harvests in Districts 4, 5, and 6, could not be estimated because of small sample sizes. The harvest estimate for District 5 subsistence fish wheel harvest was based on District 4 samples. Subsistence harvest age and sex composition for District 1 was estimated using the District 1 commercial gillnet catch. Districts 2 and 3 subsistence harvests were also estimated using District 1 commercial gillnet catch since District 1 had both unrestricted and restricted openings. The number of summer chum salmon harvested by age, sex, and fishery for the entire drainage was presented in Table 7, and length data was presented in Table 8, while age and sex composition for each fishery was presented by sample period in Appendix E. Age, sex, and size composition of test fishing samples was shown in Appendix E.11.

Age and sex composition for 90% of the total drainage summer chum harvest was estimated. Uncharacteristically, age 0.4 and age 0.3 were harvested in approximately equal numbers. The percentage of age-0.4 fish was 48%, followed by ages 0.3 (47%), 0.5 (5%), and 0.2 (>1%). The total harvest was composed of 51% females.

The apportionment of samples from the commercial gillnet fishery in Districts 1 and 2 (Appendix E) were comprised of more age-0.4 fish (53% and 51%, respectively) than the commercial fish wheel fishery in District 4 (38% age 0.4), and District 6 commercial and subsistence fish wheel fishery (23% age 0.4). However, the percentage of females in District 1 gillnet (51%) and District 4 (51%) fish wheel fisheries were equal, while the District 2 gillnet harvest was 42% females and the District 6 fish wheel harvest was 64% females.

A temporal trend in age composition (NSC) has been apparent for the District 1 commercial gillnet fishery. As the season progressed age-0.4 fish declined in relative abundance, while age-0.3 fish increased. This trend was apparent during the 1980s when age-0.3 fish often were the majority of the harvest throughout the season. However, since 1988 this trend has not been as pronounced and age-0.3 fish have no longer been the majority of the harvest. In recent years poor returns of age-0.3 fish have resulted in earlier season closures. Likewise, in 1993 poor returns of summer chum, particularly age-0.3 fish, resulted in the earliest end to the commercial season in over ten years.

Age, sex, and length data for summer chum salmon were collected only from lower Yukon River spawning locations in 1993 (Tables 9, 10). In contrast to the harvests in Districts 1 and 2, and test fishing catches from Big Eddy and Middle Mouth, age-0.3 fish comprised the majority of the escapement samples. The difference may be attributable to gillnet selectivity for the larger, age-0.4 and -0.5, fish. The District 4 fish wheel samples were 59% age 0.3, 38% age 0.4, 3% age 0.5, while the Anvik River escapement sample were 63% age 0.3, 34%, age 0.4, and 3% age 0.5. However, since no escapement samples were taken from any Yukon River tributaries upriver from District 4, and the majority of the District 4 catch samples were from above the Anvik River confluence, a statistical comparison of fish wheel selectivity is not possible. On both the East and West Fork Andreafsky Rivers escapement samples were obtained from beach-seined live fish and carcass recovery. There was no apparent difference in age and sex composition from the two sampling methods. Age-0.3

fish comprised 55% of the West Fork Andreafsky River to 65% of the East Fork Andreafsky River spawning stocks. Age-0.4 fish ranged from 33% on the East Fork Andreafsky to 42% on the West Fork Andreafsky River. Samples from the Anvik River were collected by beach seine gear throughout the spawning migration and the age composition was approximately the same (NSC) as the East Fork Andreafsky River. Sex composition ranged from 49% female on the East Fork Andreafsky River to 58% female on the West Fork Andreafsky River.

For a number of years fish from the Andreafsky River have been smaller in size than other escapements, e.g., Anvik, Chena, and Salcha Rivers. This pattern was again seen in 1993 with the mean length of fish from the Andreafsky River averaging approximately 30 mm less than Anvik River fish. For the Andreafsky River the mean length of age-0.3 females was 519 mm while the mean length was 548 mm on the Anvik River. Age-0.4 females averaged 532 mm and 533 mm on the East and West Fork Andreafsky Rivers, respectively, and 561 mm on the Anvik River. The mean length for age-0.3 males was 545 mm and 549 mm on the East and West Fork Andreafsky Rivers, respectively, and age-0.4 males averaged 572 mm and 577 mm. On the Anvik River, age-0.3 males averaged 583 mm and age-0.4 males averaged 600 mm. Similar length differences were seen for the other age classes. An analysis of variance (ANOVA) using age (0.3 and 0.4), sex, and river as factors indicated a statistically significant difference ($P < 0.001$) in length of chum salmon between the three rivers. A multiple comparison using a Bonferroni adjustment for the experiment-wide significance level (Neter et. al. 1990) indicated the lengths of chum salmon from the East Fork Andreafsky River and the West Fork Andreafsky River were not statistically significant ($P > 0.999$), but that lengths of chum salmon from the Anvik River were significantly different ($P < 0.001$) from the East and West Fork Andreafsky Rivers (J. Bromaghin, Alaska Department of Fish and Game, Anchorage, personal communication). No samples were taken from the Chena or Salcha Rivers in 1993.

Fall Chum

The number of fall chum salmon harvested by age, sex, and fishery is presented in Table 11. Age and sex composition for each district fishery and test fishing sample is presented in Appendix F. Age and sex composition for 13% and age composition for 17% (sex of fish sampled was not recorded in Canada) of the total drainage fall chum harvest were estimated. Since there were no commercial fisheries during the fall season in Alaska, and the subsistence fisheries were not sampled, test fishery samples were used to estimate age and sex composition of subsistence fishery harvests, where feasible. The harvest on the Lower Yukon River was apportioned from catches sampled from ADF&G test nets near the river mouth (Appendix F.5). The portion of the Canadian catch estimated to have been taken by fish wheels was apportioned using the DFO test fish wheel catch samples.

Age and sex composition from lower Yukon River test fishing catches was comprised of 62% age 0.3, and 36% age 0.4., with females being the majority of each age group. Overall

females comprised 64% of test net catches. With the exception of 1992 the age and sex composition corresponds well with previous years fall chum salmon catches. For years preceding 1992 fall chum catches from both the test fishing and the commercial fishery samples had a majority of age-0.3 fish, and often a majority of females. An exception was 1992 when lower Yukon River test net catches, which were also used to apportion the subsistence harvest, differed in age composition with 59% age 0.4 and 39% age 0.3, but had similar sex composition with 67% females. Fall chum salmon escapements in 1992 also had a majority of age-0.4 fish in all rivers sampled. Age composition from DFO test wheels in 1993 was 66% age-0.3 fish and 32% age-0.4 fish. As in previous years Canadian age composition corresponded well with lower Yukon River age composition data.

Age, sex, and length data was collected from fall chum escapements in the Tanana, Toklat, Delta, and Sheenjek Rivers, and Bluff Cabin Slough (Tables 12, 13). Age compositions ranged from 55% age 0.3 for the Tanana River to 64% age 0.3 for the Sheenjek River, and from 30% age 0.4 for the Toklat River to 42% age 0.4 for the Delta River. Sex composition ranged from 44% female for the Sheenjek River to 54% female for Bluff Cabin Slough.

For all samples mean length of males was larger than females of all ages, except Toklat River age-0.5 fish. Mean length of male fall chum salmon ranged from 531 mm for an age-0.2 fish on the Toklat River to 627 mm for an age-0.5 fish on the Tanana River. Female fall chum salmon ranged from 508 mm for an age-0.2 fish on the Toklat River to 623 mm for an age-0.5 fish on the Sheenjek River. Other samples exhibited size frequencies within the range of the above samples.

Coho

Catch by age and sex was estimated for 26% of the total coho harvest in 1993 (Table 14). Since there were no commercial coho fisheries, and the subsistence fisheries were not sampled, test fishery samples were used to estimate age and sex composition of subsistence fishery harvests, where feasible. The harvest on the Lower Yukon River was apportioned from the Big Eddy and Middle Mouth test net catches (Appendix G.4).

Age-2.1 fish accounted for 84% of the test net catches. Mean length of coho salmon from test net catch samples was similar for all ages and sexes. Age composition from the Delta Clearwater River escapement samples was unlike test net catches, with age-1.1 fish accounting for 63% of the escapement (Table 15). The mean length of coho salmon escapement samples was similar for all ages and sexes. However, the mean length for the escapement samples was approximately 20 mm less than the mean length for the test net catch samples. More escapement data from various spawning locations would be necessary for possible explanations as to the differences between the two samples.

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Table 1. Yukon River commercial and subsistence salmon harvest by district and species, 1993.

District	Chinook			Summer Chum			Fall Chum			Coho		
	Comm. ^a	Subs. ^b	Total	Comm. ^a	Subs. ^b	Total	Comm.	Subs. ^b	Total	Comm.	Subs. ^b	Total
1	50,694	10,423	61,117	75,038	34,285	109,323		7,770	7,770		2,343	2,343
2	37,457	11,516	48,973	19,822	25,417	45,239		3,094	3,094		1,695	1,695
3	1,501	6,474	7,975	463	3,376	3,839		1,238	1,238		240	240
Lower Yukon	89,652	28,413	118,065	95,323	63,078	158,401		12,102	12,102		4,278	4,278
4 ^{c,d,f}	1,577	12,042	13,619	42,957	24,259	67,216		11,043	11,043		1,206	1,206
5 ^g	3,008	22,111	25,119	0	11,245	11,245		43,764	43,764		5,984	5,984
6 ^e	1,445	3,134	4,579	3,705	7,472	11,177		10,179	10,179		4,304	4,304
Upper Yukon	6,030	37,287	43,317	46,662	42,976	89,638		64,986	64,986		11,494	11,494
Sport Fish (Alaska)			1,695			564						897
U.S. Total ^h	95,682	65,700	163,077	141,985	106,054	248,603		77,088	77,088		15,772	16,669
Porcupine		142	142					1,668	1,668		60	60
Mainstem Yukon	10,350	5,819	16,169				7,762	4,660	12,422			
Sport Fish			300						0			
Canada Total ^j	10,350	5,961	16,611				7,762	6,328	14,090		60	60
Yukon Drainage Total	106,032	71,661	179,688	141,985	106,054	248,603	7,762	83,416	91,178		15,832	16,729

^a Commercial harvest includes ADF&G test fish sales in Districts 1 and 2.

^b Subsistence harvest includes subsistence and personal use fisheries in Alaska, and the Aboriginal and domestic fisheries in Canada. Total does not include Hooper Bay and Scammon Bay harvest of 1,429 chinook, 20,798 summer chum, 120 fall chum, and 40 coho salmon.

^c Roe sales from Districts 4 and 6 have been converted into total fish.

^d Total includes Innoko River and Koyukuk River subsistence harvests.

^f Summer chum subsistence catch does not include fish taken during commercial roe fishery used for subsistence.

^g Total includes Black River and Chandalar River subsistence harvests.

^h Total harvest includes commercial, subsistence, and sport fisheries and ADF&G test fish sales.

^j Total harvest includes commercial, subsistence, and sport fisheries.

Table 2. Yukon River salmon spawning escapement estimates by species, 1993.

Stream (drainage) *	Date	Survey Rating	Chinook	Summer Chum	Fall Chum	Coho
Andreafsky River						
East Fork	7/11	Good	5,855	10,935	(Few Pink Salmon)	
West Fork	7/11	Good	2,765	9,111	---	
	Subtotal		8,620	20,046	---	---
Innoko River ^{b,c}	7/8-31		4	339	---	---
Dishna River ^{b,c}	7/10-31		1	39	---	---
Finland Creek ^{b,c}	7/29-30		0	5	---	---
Scandinavian Creek ^{b,c}	7/29-30		0	2	---	---
Yukon River (Pilot Station)						
Main River (Biosonics Sonar)	6/4-8/31		(134,855)	(947,192)	(291,700)	(41,619)
Anvik River						
Aerial Counts						
Mainstem-Goblet Cr to McDonald Cr	7/23	Fair-Poor	1,620	(58,175)	---	---
Mainstem Yellow Ri-McDonald Cr	7/23	Fair-Poor	(1,525)	---	---	---
Beaver Creek	7/23	Fair-Poor	100	(8,000)	---	---
Bendix Sonar Estimate	6/19-7/25		---	517,409	---	---
	Subtotal		1,720	517,409	---	---
Blackburn Creek ^d	7/19	Good	2	1,362	---	---
Rodo River	7/16	Good	529	7,867	---	---
Kaltag River			---	---		
Tower (4-H & Youth Development)	7/7-29	Partial Counts	145 ^f	10,005 ^f	---	---
Nulato River						
South Fork	7/22	Good	1,181	5,486	---	---
North Fork (from confl w/ Yukon)	7/22	Good	1,844	7,662	---	---
	Subtotal		3,025	13,148	---	---
Total Yukon River (downstream of Koyukuk River)			14,046	570,222	---	---
Koyukuk River Drainage						
Gisasa River	7/22	Good	1,573	1,581	---	---
Kateel River	7/27	Fair	112	7	---	---
Billy Hawk Creek	8/18-25, 9/1-7		---	4	---	---
Dakli River	7/23	Flyover-Incomplete	---	2,027	---	---
Wheeler Creek	7/22	Flyover-Incomplete	---	3,875	---	---
	Subtotal		0	5,902	---	---
Hogatza River						
Caribou Creek-upper portion ^d	7/28	Good	---	525	---	---
Mathews Slough						
Pocahontus Creek	7/28	Incomplete	0	0	---	---
Indian River	7/28	Incomplete	0	413	---	---
Alatna River						
Helpmejack Creek	7/28	Fair	0	14	---	---
Malamute Fork	7/28	Fair	34	12	---	---
Iniakuk River	7/28	Fair	4	139	---	---
	Subtotal		38	165	---	---
Henshaw Creek	7/23	Good	330	1,773	---	---
South Fork Koyukuk River	7/23	Fair	260	92	---	---
Jim River	7/23	Fair-Good	161	32	---	---
	Subtotal		421	124	---	---
John River-Timber Creek	7/30	Poor	0	0	---	---
	Total Koyukuk River		2,474	10,494	---	---
Melozzi Hot Springs Creek	7/21	Good-Fair	15	590	---	---
Nowitna River	6/29-7/18, 9/3-4		12	0	2	0
Tozitna River	7/21	Good	389	970	---	---
Total Yukon River (downstream of Tanana River)			16,936	582,276	2	---

-Continued-

Table 2. (page 2 of 4)

Stream (drainage) ^a	Date	Survey Rating	Chinook	Summer Chum	Fall Chum	Coho
Lower Tanana River Drainage						
Kantishna River Drainage						
Toklat River (upper index area—aerial)	10/22	Fair	--	--	(16,068)	(30)
Barton Creek (upper spring area)	10/25	Fair	--	--	0	141
Floodplain vic Roadhouse ^b	10/20–25	Good–Fair	--	--	(14,661)	69
Geiger Creek ^d	10/21	Good	--	--	(5,358)	138
Sushana River ^d	10/23	Fair–Good	--	--	(1,906)	39
Population Estimate ^b	10/20–25, 11/12		--	--	28,171	--
	Subtotal		--	--	28,171	387
Nenana River Drainage						
(Aerial—upstream of Teklanika R)	10/4	Early (?)	--	--	75	419
Eastern spring area off Teklanika River vicinity Comma Lake	10/25	Fair	--	--	--	3
Seventeen Mile Slough	10/4	Fair	--	--	352	581
Lost Slough (east floodplain)	10/22	Fair	--	--	0	240
Lost Slough (west floodplain)	10/4	Early (?)	--	--	0	244
Panguingue Creek ^d	10/12	Fair	--	--	--	4
Lignite Spring ^d	10/12	Good	--	--	--	41
	Subtotal		0	0	427	1,532
Chatanika River (Steese Br to Elliot Br) ^{ki}	7/23	Good	253	(1)	--	--
Chatanika River	7/26	Fair	(75)	30	--	--
	Subtotal		253	30	--	--
Chena River						
Mainstem River (aerial)	7/25	Fair	(2,943)	(168)	--	--
MCD to Middle Fk (index area)	7/25	Fair	(2,660)	--	--	--
Slough #1 (Foot Survey)	8/16	Good	0	(324)	--	--
Slough #2 (Foot Survey)	8/16	Good	0	(156)	--	--
Slough #3 (Foot Survey)	8/17	Good	0	(108)	--	--
Slough #4 (Foot Survey)	8/17	Good	0	(304)	--	--
Population Estimate ^{ki,k}	7/1–8/7		12,241	5,400	--	--
	Subtotal		12,241	5,400	--	--
Salcha River						
Mainstem River (aerial)	7/25	Fair	(3,636)	(212)	--	--
TAPS to Caribou Cr. (index area)	7/25	Fair	(3,562)	--	--	--
Slough #1 (Foot Survey)	8/12	Good	0	(90)	--	--
Slough #2 (Foot Survey)	8/12	Good	0	(356)	--	--
Slough #3 (Foot Survey)	8/12	Good	(14)	(697)	--	--
Slough #4 (Foot Survey)	8/12	Good	0	(273)	--	--
Population Estimate ^{ki,k}	7/1–8/7		10,007	5,809	--	--
	Subtotal		10,007	5,809	--	--
Total Lower Tanana River			22,501	11,239	28,598	1,919
Upper Tanana River Drainage						
Mainstem Tanana sloughs between						
Open water vic of Little Delta R	11/9	Partial/ice cover	--	--	253	0
Slough immed upstream Shaw Creek ^d	10/13	Poor	--	--	3	0
Sloughs across from Timber ^b	11/9	Partial/ice cover	--	--	907	0
Delta River						
Foot Survey (peak count)	11/12	Good	--	--	(19,560)	--
Population estimate ^{km}			--	--	19,857 ^a	--
Goodpaster River	7/26	Fair	224	0	--	--
Bluff Cabin Slough (BCS)	11/9	Fair	--	--	5,550	1
Sloughs adj to BCS off main Tanana	11/9	Fair	--	--	440	0
Clearwater Lake Outlet Slough	11/9	Fair	--	--	2,490	10
Clearwater Lake Outlet ^{li}	10/29	Good	--	--	less than 50	550

–Continued–

Table 2. (page 3 of 4)

Stream (drainage) ^a	Date	Survey Rating	Chinook	Summer Chum	Fall Chum	Coho
Delta Clearwater River ^{4,1}	10/21, 10/29	Good, Good	--	--	751	10,875
Onemile Slough--aerial	11/9	Fair	--	--	1,270	50
Other upper Tanana sloughs from upper end onemile slough to 4 miles upstr.	11/9	Fair	--	--	35	2
Total Upper Tanana River			224	0	31,556	11,488
Total Tanana River			22,725	11,239	60,154	13,407
Beaver Creek ^{i,2}	7/15-24	Good	89	1	--	--
Chandalar River ^b	10/4	Fair	--	--	1,390	--
Porcupine River Drainage						
Sheenjek River						
Bendix Sonar Estimate	8/8-9/28	Good	--	--	42,922	--
Coleen River ^b	8/18, 10/5	Good, Good	0	0	0	0
Fishing Branch River (Aerial)	10/17	Good	--	--	(4,471)	--
Weir Passage ³	8/31-10/25		--	--	28,798	--
Total Porcupine River			--	--	71,720	0
Yukon River (Eagle)						
Main River HTI Sonar (split beam)						(2nd Year - Developmental)
Total Alaskan Portion of Drainage			39,750	593,516	104,468 ²	13,407
Yukon Territory Streams ³						
White River						
Donjek River	10/21	GSI collections	--	--	15	--
Kluane River	10/21	Good	--	--	4,610	--
Koidern River	10/21	Good	--	--	0	--
Subtotal			0	--	4,625	--
Pelly River Drainage						
Ross River	8/20	Good	400	--	--	--
Tatchum Creek ⁴	8/19	Good	183	--	--	--
Little Salmon River	8/19	Good	184	--	--	--
Big Salmon River						
Big Salmon Lake to vicinity Souch Cr	8/19	Good	572	--	--	--
Teslin River Drainage						
Mainstem vicinity Boswell Cr	10/29	Good	--	--	555	--
Nisutlin River						
Mainstem (Sidney Cr-100 mile Cr)	8/19	Good	339	--	--	--
Wolf River (Wolf Lk-Fish Cr)	8/19	Good	168	--	--	--
Subtotal			507	--	555	--
McIntyre Creek ⁴	8/26	Fair	9	--	--	--
Whitehorse Fishway Counts	7/24-9/2		668 ³	--	--	--
Michie Creek aerial	8/19	Flyover-Poor	(10)	--	--	--
Michie Creek weir	8/31-10-25		(284)	--	--	--
Mainstem Yukon River						
Tatchum Creek to Ft. Selkirk	10/23	Fair	--	--	2,620	--
Border Passage Estimate ^{3,*}			(45,027)	--	(42,165)	--
Subtotal			--	--	2,620	--
Total Yukon Territory (observed)			2,514	--	36,598 ²	--
Total Yukon Territory (estimated) [*]			(28,558)	--	(29,743)	--
Yukon River Drainage Totals			42,264	593,516	141,066	13,407

-Continued-

Table 2. (page 4 of 4)

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- ^a Estimates are from aerial surveys (peak count) unless otherwise indicated; carcass counts included. Data in parentheses are not included in totals or subtotals.
- ^b USFWS estimate.
- ^c Gillnet test fishing.
- ^d Foot Survey.
- ^e Unexpanded (partial) tower counts. Numbers represent "net" upstream movement (i.e., upstream minus downstream passage).
- ^f Combination foot and aerial survey.
- ^g Population estimate based upon survey timing and salmon streamlife data.
- ^h Sport Fish Division estimate.
- ⁱ Boat survey.
- ^j Population estimate based upon expanded counting tower observations.
- ^k Population estimate based upon replicate foot surveys and salmon streamlife data.
- ^l The 95% Confidence Interval on the estimate is 19,560–20,998.
- ^m BLM estimate.
- ⁿ Canada Department of Fisheries and Oceans (DFO) estimate.
- ^o Total for Alaskan portion of drainage does not include Fishing Branch River. Total for Yukon Territory includes Fishing Branch River.
- ^p Only 505 of the chinook salmon which returned to the fishway were passed (included 22 males that had spawned once). Seven mortalities were noted in the fishway and 89 females and 67 males were taken for hatchery brood stock. A total of 288 adipose–clipped fish was counted.
- ^q Population estimate based upon survey mark and recapture study.
- ^r Canadian border passage estimate for Yukon Territory streams excluding the Fishing Branch River. Canadian harvest has not been removed; these are "border" escapement estimates.
- ^s Canadian estimated spawning escapement for Yukon Territory streams excluding the Fishing Branch River; from DFO tagging study (border passage estimate minus Canadian harvest).
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Table 3. Harvest of Yukon River chinook salmon by age, sex, and fishery, 1993.

District	Fishery	Sample Size	Sex	Brood Year and Age Group ^a										Total		
				1990		1989		1988		1987		1986			1985	
				1.1	1.2	1.3	2.2	1.4	2.3	1.5	2.4	1.6	2.5			
1	Commercial Gillnet	1,868	Female	0	233	3,613	0	17,156	98	2,704	199	0	0	24,003		
			Male	0	2,494	6,902	0	14,109	100	1,368	301	0	8	25,283		
			Total	0	2,728	10,515	0	31,265	198	4,072	500	0	8	49,286		
1	Subsistence Gillnet		Female	0	71	1,316	0	4,304	36	498	0	0	0	6,225		
			Male	0	605	1,530	0	1,601	0	391	71	0	0	4,198		
			Total	0	676	2,846	0	5,905	36	889	71	0	0	10,423		
2	Commercial Gillnet	1,210	Female	0	90	2,660	0	12,591	61	1,412	229	0	13	17,054		
			Male	24	1,878	5,871	0	10,651	74	1,499	242	0	0	20,239		
			Total	24	1,968	8,531	0	23,242	135	2,910	471	0	13	37,293		
2	Subsistence Gillnet		Female	0	55	1,322	0	3,251	0	551	165	0	0	5,345		
			Male	0	716	2,369	0	2,369	55	551	110	0	0	6,171		
			Total	0	771	3,692	0	5,620	55	1,102	276	0	0	11,516		
3	Commercial Gillnet		Female	0	4	107	0	507	2	57	9	0	1	686		
			Male	1	76	236	0	429	3	60	10	0	0	815		
			Total	1	79	343	0	935	5	117	19	0	1	1,501		
3	Subsistence Gillnet		Female	0	31	743	0	1,828	0	310	93	0	0	3,005		
			Male	0	403	1,332	0	1,332	31	310	62	0	0	3,469		
			Total	0	434	2,075	0	3,160	31	620	155	0	0	6,474		
4	Comm & Subs Gillnet	92	Female	0	0	61	0	970	30	152	0	0	0	1,213		
			Male	0	0	485	0	1,061	0	30	0	0	0	1,577		
			Total	0	0	546	0	2,031	30	182	0	0	0	2,789		

-Continued-

Table 3. (page 2 of 2)

District	Fishery	Sample Size	Sex	Brood Year and Age Group ^a										Total
				1990	1989	1988		1987		1986		1985		
				1.1	1.2	1.3	2.2	1.4	2.3	1.5	2.4	1.6	2.5	
4	Comm & Subs Fish Wheel	272	Female	0	279	239	0	557	40	40	0	0	0	1,155
			Male	199	5,773	2,867	80	717	40	0	0	0	0	9,675
			Total	199	6,052	3,106	80	1,274	80	40	0	0	0	10,830
5	Comm & Subs Gillnet	249	Female	0	25	535	0	2,113	25	153	25	0	25	2,903
			Male	0	356	1,375	0	1,528	25	153	0	0	0	3,438
			Total	0	382	1,910	0	3,641	51	306	25	0	25	6,340
5	Comm & Subs Fish Wheel	58	Female	0	324	648	0	971	0	324	324	0	0	2,590
			Male	0	9,389	5,180	0	1,295	0	324	0	0	0	16,188
			Total	0	9,713	5,828	0	2,266	0	648	324	0	0	18,779
6	Comm & Subs Fish Wheel	285	Female	0	18	289	0	419	0	13	0	0	0	739
			Male	114	2,469	850	0	331	0	0	0	0	0	3,764
			Total	114	2,487	1,139	0	750	0	13	0	0	0	4,503
	Alaska Harvest ^{b,c}		Female	0	1,130	11,533	0	44,668	293	6,212	1,045	0	39	64,918
		Male	338	24,160	28,997	80	35,422	328	4,687	796	0	8	94,816	
		Total	338	25,290	40,531	80	80,091	621	10,898	1,841	0	47	159,734	

^a Discrepancies in row and column addition by category are due to rounding error and may be ignored.

^b Total does not include ADF&G test fish sales in District 1 (1,408) and District 2 (164).

^c District 6 gillnet (76), Alaska sport fish (1,695) and Canada harvests (16,611) of chinook salmon were not included due to insufficient samples.

Table 4. Length (mm measured from mid-orbit to fork-of-tail) by age and sex of Yukon River chinook salmon commercial and subsistence catch samples, 1993.

Fishery	Sex		Brood Year and Age Group										
			1990		1989		1988		1987		1986		1985
			1.1	1.2	1.3	2.2	1.4	2.3	1.5	2.4	2.5		
District 1 Commercial 6 in (15.2 cm) Maximum Mesh Size Gillnet	Female	Mean Length		573	747		846		941				
		Standard Error		11.4	15.8		9.8		26.4				
		Sample Size		8	15		44		6				
	Male	Mean Length		576	712		870		1003				
		Standard Error		6.0	14.1		12.5		36.1				
		Sample Size		46	34		37		5				
District 1 Commercial Unrestricted Mesh Size Gillnet	Female	Mean Length		660	783		864	740	930	871			
		Standard Error		21.4	5.3		2.0	40.0	5.0	11.6			
		Sample Size		6	136		618	2	81	4			
	Male	Mean Length		578	747		861	740	960	861	840		
		Standard Error		5.3	4.8		3.0	60.0	8.6	17.1	0.0		
		Sample Size		130	222		424	2	39	7	1		
District 2 Commercial Unrestricted Mesh Size Gillnet	Female	Mean Length		643	780		858	718	909	845	905		
		Standard Error		22.8	7.4		2.0	7.5	5.8	10.3	0.0		
		Sample Size		4	84		430	2	51	6	1		
	Male	Mean Length	455	565	744		854	684	945	817			
		Standard Error	0.0	5.2	4.8		3.3	22.0	8.9	33.5			
		Sample Size	1	64	170		333	4	54	3			
District 4 Commercial Gillnet	Female	Mean Length			818		875	790	938				
		Standard Error			12.5		8.5	0.0	20.7				
		Sample Size			2		32	1	5				
	Male	Mean Length			776		868		920				
		Standard Error			9.3		11.8		0.0				
		Sample Size			16		35		1				
District 4 Commercial Fish Wheel	Female	Mean Length		592	788		845	720	840				
		Standard Error		24.0	21.9		11.2	0.0	0.0				
		Sample Size		7	6		14	1	1				
	Male	Mean Length	460	538	716	565	839	705					
		Standard Error	24.9	4.1	7.6	25.0	18.4	0.0					
		Sample Size	5	145	72	2	18	1					

-Continued-

Table 4. (page 2 of 2)

Fishery	Sex		Brood Year and Age Group								
			1990	1989	1988		1987		1986		1985
			1.1	1.2	1.3	2.2	1.4	2.3	1.5	2.4	2.5
District 5 Commercial Gillnet	Female	Mean Length		610	764		881	820	972	890	870
		Standard Error		0.0	15.5		5.6	0.0	10.5	0.0	0.0
		Sample Size		1	21		83	1	6	1	1
	Male	Mean Length		581	735		888	755	1022		
		Standard Error		13.8	9.7		9.2	0.0	18		
		Sample Size		14	54		60	1	6		
District 5 Commercial Fish Wheel	Female	Mean Length		710	698		932		900		
		Standard Error		0.0	17.5		9.3		0.0		
		Sample Size		1	2		3		1		
	Male	Mean Length		566	682		834		965		
		Standard Error		9.5	7.4		63.3		0.0		
		Sample Size		29	16		4		1		
District 6 Comm & Subs Fish Wheel	Female	Mean Length		605	774		874		995		
		Standard Error		0.0	14.5		9.1		0.0		
		Sample Size		1	16		27		1		
	Male	Mean Length	441	544	710		848				
		Standard Error	20.0	4.7	7.5		18.1				
		Sample Size	5	109	52		21				

Table 5. Age and sex composition of Yukon River chinook salmon escapement samples, 1993.

		Brood Year and Age Group ^a						
		1990	1989	1988	1987		1986	Total
		1.1	1.2	1.3	1.4	2.3	1.5	
Location:	East Fork Andreafsky River							
Sample Dates:	8/5-8/7 & 8/13-8/15							
Escapement:	5,855							
Sample Size:	261							
Female	Sample Size	0	0	7	67	0	4	78
	Percent of Sample	0.0	0.0	2.7	25.7	0.0	1.5	29.9
Male	Sample Size	1	44	94	42	0	2	183
	Percent of Sample	0.4	16.9	36.0	16.1	0.0	0.8	70.1
Total	Sample Size	1	44	101	109	0	6	261
	Percent of Sample	0.4	16.9	38.7	41.8	0.0	2.3	100.0
	Standard Error	0.4	2.3	3.0	3.1	0.0	0.9	
Location:	West Fork Andreafsky River							
Sample Dates:	7/31-8/2 & 8/9-8/12							
Escapement:	2,765							
Sample Size:	145							
Female	Sample Size	0	0	3	58	0	3	64
	Percent of Sample	0.0	0.0	2.1	40.0	0.0	2.1	44.1
Male	Sample Size	0	20	34	27	0	0	81
	Percent of Sample	0.0	13.8	23.4	18.6	0.0	0.0	55.9
Total	Sample Size	0	20	37	85	0	3	145
	Percent of Sample	0.0	13.8	25.5	58.6	0.0	2.1	100.0
	Standard Error	0.0	2.9	3.6	4.1	0.0	1.2	
Location:	Anvik River							
Sample Dates:	7/30-8/8							
Escapement:	1,720							
Sample Size:	340							
Female	Sample Size	0	0	27	109	0	7	143
	Percent of Sample	0.0	0.0	7.9	32.1	0.0	2.1	42.1
Male	Sample Size	0	47	104	46	0	0	197
	Percent of Sample	0.0	13.8	30.6	13.5	0.0	0.0	57.9
Total	Sample Size	0	47	131	155	0	7	340
	Percent of Sample	0.0	13.8	38.5	45.6	0.0	2.1	100.0
	Standard Error	0.0	1.9	2.6	2.7	0.0	0.8	

-Continued-

Table 5. (page 2 of 2)

		Brood Year and Age Group ^a						
		1990	1989	1988	1987		1986	
		1.1	1.2	1.3	1.4	2.3	1.5	Total
Location:	Chena River							
Sample Dates:	8/5–8/20							
Escapement:	12,241							
Sample Size:	187							
Female	Sample Size	0	0	8	22	0	1	31
	Percent of Sample	0.0	0.0	4.3	11.8	0.0	0.5	16.6
Male	Sample Size	1	55	69	30	0	1	156
	Percent of Sample	0.5	29.4	36.9	16.0	0.0	0.5	83.4
Total	Sample Size	1	55	77	52	0	2	187
	Percent of Sample	0.5	29.4	41.2	27.8	0.0	1.1	100.0
	Standard Error	0.5	3.3	3.6	3.3	0.0	0.8	
Location:	Salcha River							
Sample Dates:	8/3–8/5							
Escapement:	10,007							
Sample Size:	453							
Female	Sample Size	0	1	28	92	0	4	125
	Percent of Sample	0.0	0.2	6.2	20.3	0.0	0.9	27.6
Male	Sample Size	4	126	149	48	1	0	328
	Percent of Sample	0.9	27.8	32.9	10.6	0.2	0.0	72.4
Total	Sample Size	4	127	177	140	1	4	453
	Percent of Sample	0.9	28.0	39.1	30.9	0.2	0.9	100.0
	Standard Error	0.4	2.1	2.3	2.2	0.2	0.4	

^a All samples collected from carcasses or from spawned out live fish captured with spears.

Table 6. Length (mm measured from mid-orbit to fork-of-tail) by age and sex of Yukon River chinook salmon escapement samples, 1993.

River	Sex		Brood Year and Age Group ^a					
			1990	1989	1988	1987		1986
			1.1	1.2	1.3	1.4	2.3	1.5
East Fork Andreafsky	Female	Mean Length			789	834	833	
		Standard Error			19.5	5.1	37.5	
		Sample Size			7	66	2	
	Male	Mean Length	420	572	720	823	988	
		Standard Error	0.0	6.7	5.6	8.1	57.5	
		Sample Size	1	43	93	41	2	
West Fork Andreafsky	Female	Mean Length			818	835	845	
		Standard Error			33.2	6.5	20.2	
		Sample Size			3	58	3	
	Male	Mean Length		580	687	839		
		Standard Error		18.8	9.5	11.2		
		Sample Size		20	32	26		
Anvik	Female	Mean Length			793	832	887	
		Standard Error			10.0	5.0	25.2	
		Sample Size			27	109	7	
	Male	Mean Length		582	703	820		
		Standard Error		9.4	5.7	9.5		
		Sample Size		47	104	46		
Chena	Female	Mean Length			834	846	945	
		Standard Error			36.8	10.0	0.0	
		Sample Size			8	22	1	
	Male	Mean Length	495	591	698	788		
		Standard Error	0.0	13.9	8.3	20.9		
		Sample Size	1	55	69	29		
Salcha	Female	Mean Length		660	781	858	918	
		Standard Error		0.0	12.0	4.9	27.8	
		Sample Size		1	28	92	4	
	Male	Mean Length	503	560	711	845	760	
		Standard Error	35.0	3.4	5.8	14.2	0.0	
		Sample Size	4	126	149	48	1	

^a Samples collected from carcasses or from spawned out live fish captured with spears.

Table 7. Harvest of Yukon River summer chum salmon by age, sex, and fishery, 1993.

District	Fishery	Sample Size	Sex	Brood Year and Age Group ^a				Total
				1990	1989	1988	1987	
				0.2	0.3	0.4	0.5	
1	Commercial Gillnet	1,068	Female	269	14,902	20,821	1,740	37,733
			Male	0	15,791	18,260	1,875	35,926
			Total	269	30,693	39,081	3,616	73,659
1	Subsistence Gillnet		Female	125	6,936	9,691	810	17,563
			Male	0	7,350	8,499	873	16,722
			Total	125	14,286	18,191	1,683	34,285
2	Commercial Gillnet	218	Female	0	3,281	4,168	709	8,158
			Male	0	4,877	5,675	621	11,174
			Total	0	8,158	9,843	1,330	19,332
2	Subsistence Gillnet		Female	93	5,142	7,185	601	13,020
			Male	0	5,449	6,301	647	12,397
			Total	93	10,591	13,485	1,248	25,417
3	Commercial Gillnet		Female	0	79	100	17	195
			Male	0	117	136	15	268
			Total	0	195	236	32	463
3	Subsistence Gillnet		Female	12	683	954	80	1,729
			Male	0	724	837	86	1,647
			Total	12	1,407	1,791	166	3,376
4	Comm & Subs Fish Wheel	366	Female	135	14,485	9,882	948	25,450
			Male	0	14,485	8,935	677	24,096
			Total	135	28,969	18,817	1,624	49,546
5	Subsistence Fish Wheel		Female	21	2,212	1,509	145	3,887
			Male	0	2,212	1,365	103	3,680
			Total	21	4,424	2,874	248	7,567
6	Comm & Subs Fish Wheel	359	Female	170	4,899	1,261	24	6,354
			Male	97	2,469	975	49	3,589
			Total	267	7,368	2,236	73	9,943
Alaska Harvest ^{b,c}			Female	825	52,620	55,572	5,074	114,091
			Male	97	53,473	50,982	4,946	109,498
			Total	922	106,093	106,554	10,019	223,588

^a Discrepancies in row and column addition by category are due to rounding error and may be ignored.

^b Total does not include ADF&G test fish sales in District 1 (1,379) and District 2 (490).

^c Districts 4 (17,670), 5 (3,678), and 6 (1,234) gillnet harvests and the drainage sport fish (564) harvest were not included due to insufficient samples.

Table 8. Length (mm measured from mid-orbit to fork-of-tail) by age and sex of Yukon River summer chum salmon commercial and subsistence catch samples, 1993.

Fishery	Sex		Brood Year and Age Group			
			1990	1989	1988	1987
			0.2	0.3	0.4	0.5
District 1 Commercial 6 in (15.2 cm) Maximum Mesh Size Gillnet	Female	Mean Length	575	549	569	565
		Standard Error	0.0	3.5	3.9	19.3
		Sample Size	1	40	51	4
	Male	Mean Length		572	582	610
		Standard Error		3.2	4.2	70.0
		Sample Size		41	43	2
District 1 Commercial Unrestricted Mesh Size Gillnet	Female	Mean Length	540	554	566	582
		Standard Error	0.0	2.1	1.7	6.1
		Sample Size	1	155	251	24
	Male	Mean Length		569	589	603
		Standard Error		1.8	2.1	5.4
		Sample Size		169	238	47
District 2 Commercial Unrestricted Mesh Size Gillnet	Female	Mean Length		560	569	578
		Standard Error		4.2	4.1	4.1
		Sample Size		37	47	8
	Male	Mean Length		573	591	611
		Standard Error		4.5	3.6	12.6
		Sample Size		55	64	7
District 4 Commercial Fish Wheel	Female	Mean Length	510	544	562	579
		Standard Error	0.0	2.7	3.8	5.4
		Sample Size	1	107	73	7
	Male	Mean Length		576	595	613
		Standard Error		3.1	3.6	13.5
		Sample Size		107	66	5
District 6 Comm. & Subs. Fish Wheel	Female	Mean Length	552	565	579	595
		Standard Error	15.2	2.3	4.4	0.0
		Sample Size	5	157	41	1
	Male	Mean Length	607	585	603	
		Standard Error	8.8	3.8	6.6	
		Sample Size	3	79	28	

Table 9. Age and sex composition of Yukon River summer chum salmon escapement samples, 1993.

		Brood Year and Age Group				
		1990	1989	1988	1987	
		0.2	0.3	0.4	0.5	Total
Location:	East Fork Andreafsky River ^a					
Escapement	10,935					
Sample Dates:	7/22 & 8/5–8/7					
Sample Size:	181					
Female	Sample Size	2	64	22	0	88
	Percent of Sample	1.1	35.4	12.2	0.0	48.6
Male	Sample Size	0	53	38	2	93
	Percent of Sample	0.0	29.3	21.0	1.1	51.4
Total	Sample Size	2	117	60	2	181
	Percent of Sample	1.1	64.6	33.1	1.1	100.0
	Standard Error	0.8	3.6	3.5	0.8	
Location:	West Fork Andreafsky River ^a					
Sample Dates:	7/20–7/21 & 8/1–8/2					
Escapement	9,111					
Sample Size:	192					
Female	Sample Size	0	74	35	2	111
	Percent of Sample	0.0	38.5	18.2	1.0	57.8
Male	Sample Size	0	32	45	4	81
	Percent of Sample	0.0	16.7	23.4	2.1	42.2
Total	Sample Size	0	106	80	6	192
	Percent of Sample	0.0	55.2	41.7	3.1	100.0
	Standard Error	0.0	3.6	3.6	1.3	
Location:	Anvik River ^b					
Sample Dates:	6/29–7/23					
Escapement	517,409					
Sample Size:	546					
Female	Sample Size	3	201	81	8	293
	Percent of Sample	0.5	36.8	14.8	1.5	53.7
Male	Sample Size	1	140	106	6	253
	Percent of Sample	0.2	25.6	19.4	1.1	46.3
Total	Sample Size	4	341	187	14	546
	Percent of Sample	0.7	62.5	34.2	2.6	100.0
	Standard Error	0.4	2.1	2.0	0.7	

^a Samples collected from both live fish captured with beach seines and carcasses.

^b Samples collected from live fish captured with beach seines.

Table 10. Length (mm measured from mid-orbit to fork-of-tail) by age and sex of Yukon River summer chum salmon escapement samples, 1993.

River	Sex		Brood Year and Age Group			
			1990	1989	1988	1987
			0.2	0.3	0.4	0.5
East Fork Andreafsky ^a	Female	Mean Length	493	519	532	
		Standard Error	7.5	3.0	6.0	
		Sample Size	2	64	22	
	Male	Mean Length		545	572	570
		Standard Error		4.2	6.2	0.0
		Sample Size		53	38	2
West Fork Andreafsky ^a	Female	Mean Length		519	533	520
		Standard Error		2.8	3.6	20.0
		Sample Size		74	34	2
	Male	Mean Length		549	577	588
		Standard Error		5.1	5.3	13.2
		Sample Size		32	45	4
Anvik ^b	Female	Mean Length	550	548	561	565
		Standard Error	11.6	2.0	3.2	5.2
		Sample Size	3	201	81	8
	Male	Mean Length	605	583	600	618
		Standard Error	0.0	2.3	2.9	12.5
		Sample Size	1	140	106	6

^a Samples collected from both live fish captured with beach seine and carcasses.

^b Samples collected from live fish captured with beach seine.

Table 11. Harvest of Yukon River fall chum salmon by age, sex, and fishery, 1993.

District	Fishery	Sample Size	Sex	Brood Year and Age Group ^a				Total
				1990	1989	1988	1987	
				0.2	0.3	0.4	0.5	
1	Subsistence Gillnet ^b		Female	10	3,212	1,683	82	4,986
			Male	5	1,596	1,130	53	2,784
			Total	14	4,808	2,813	135	7,770
2	Subsistence Gillnet ^b		Female	4	1,279	670	33	1,985
			Male	2	636	450	21	1,109
			Total	6	1,915	1,120	54	3,094
3	Subsistence Gillnet ^b		Female	2	512	268	13	794
			Male	1	254	180	8	444
			Total	2	766	448	21	1,238
Alaska Harvest ^c			Female	15	5,003	2,621	127	7,766
			Male	7	2,486	1,760	82	4,336
			Total	22	7,489	4,381	210	12,102
Canada Harvest Fish Wheel ^d			Total	0	2,458	1,189	79	3,727
Yukon River Harvest			Total	22	9,947	5,570	289	15,829

^a Discrepancies in row and column addition by category are due to rounding error and may be ignored.

^b Age and sex composition is based on Big Eddy and Middle Mouth fall chum salmon test fishing catches combined (1,616).

^c Districts 4 (11,043), 5 (43,764), and 6 (10,179) harvests were not included due to insufficient samples.

^d Only age composition data available from Canada test fish wheel catch samples (94). Gillnet harvest (10,363) is not included due to insufficient samples.

Table 12. Age and sex composition of Yukon River fall chum salmon escapement samples, 1993.

		Brood Year and Age Group				
		1990	1989	1988	1987	Total
		0.2	0.3	0.4	0.5	
Location:	Toklat River ^a					
Sample Dates:	10/13–10/15, 10/22					
Escapement:	16,068					
Sample Size:	191					
Female	Sample Size	7	65	26	3	101
	Percent of Sample	3.7	34.0	13.6	1.6	52.9
Male	Sample Size	4	53	31	2	90
	Percent of Sample	2.1	27.7	16.2	1.0	47.1
Total	Sample Size	11	118	57	5	191
	Percent of Sample	5.8	61.8	29.8	2.6	100.0
	Standard Error	1.7	3.5	3.3	1.2	
Location:	Delta River ^a					
Sample Dates:	11/4					
Escapement:	19,857					
Sample Size:	192					
Female	Sample Size	0	56	44	2	102
	Percent of Sample	0.0	29.2	22.9	1.0	53.1
Male	Sample Size	1	49	37	3	90
	Percent of Sample	0.5	25.5	19.3	1.6	46.4
Total	Sample Size	1	105	81	5	192
	Percent of Sample	0.5	54.7	42.2	2.6	100.0
	Standard Error	0.5	3.6	3.6	1.2	
Location:	Sheenjek River ^b					
Sample Dates:	9/14–9/23					
Escapement:	42,922					
Sample Size:	192					
Female	Sample Size	0	54	28	2	84
	Percent of Sample	0.0	28.1	14.6	1.0	43.8
Male	Sample Size	1	69	37	1	108
	Percent of Sample	0.5	35.9	19.3	0.5	56.3
Total	Sample Size	1	123	65	3	192
	Percent of Sample	0.5	64.1	33.9	1.6	100.0
	Standard Error	0.5	3.5	3.4	0.9	

–Continued–

Table 12. (page 2 of 2)

		Brood Year and Age Group				
		1990	1989	1988	1987	Total
		0.2	0.3	0.4	0.5	
Location:	Bluff Cabin Slough ^a					
Sample Dates:	11/9					
Escapement:	5,550					
Sample Size:	151					
Female	Sample Size	1	46	33	2	82
	Percent of Sample	0.7	30.5	21.9	1.3	54.3
Male	Sample Size	2	40	22	5	69
	Percent of Sample	1.3	26.5	14.6	3.3	45.7
Total	Sample Size	3	86	55	7	151
	Percent of Sample	2.0	57.0	36.4	4.6	100.0
	Standard Error	1.1	4.0	3.9	1.7	
Location:	Tanana River ^a					
Sample Dates:	11/9					
Escapement:	60,154					
Sample Size:	97					
Female	Sample Size	0	28	16	3	47
	Percent of Sample	0.0	28.9	16.5	3.1	48.5
Male	Sample Size	0	25	22	3	50
	Percent of Sample	0.0	25.8	22.7	3.1	51.5
Total	Sample Size	0	53	38	6	97
	Percent of Sample	0.0	54.6	39.2	6.2	100.0
	Standard Error	0.0	5.1	5.0	2.5	

^a Samples collected from carcasses.

^b Samples collected from live fish captured with beach seine.

Table 13. Length (mm measured from mid-orbit to fork-of-tail) by age and sex of Yukon River fall chum salmon escapement samples, 1993.

River ^a	Sex		Brood Year and Age Group			
			1990	1989	1988	1987
			0.2	0.3	0.4	0.5
Toklat	Female	Mean Length	508	540	553	558
		Standard Error	9.2	3.7	6.1	11.7
		Sample Size	7	65	26	3
	Male	Mean Length	531	558	573	535
		Standard Error	13.9	3.7	5.4	20.0
		Sample Size	4	53	31	2
Delta	Female	Mean Length		567	571	585
		Standard Error		4.4	4.3	40.0
		Sample Size		56	44	2
	Male	Mean Length	535	586	600	597
		Standard Error	0.0	4.0	5.4	14.2
		Sample Size	1	49	37	3
Bluff Cabin Slough	Female	Mean Length	525	551	583	553
		Standard Error	0.0	4.3	6.2	47.5
		Sample Size	1	46	33	2
	Male	Mean Length	545	602	628	626
		Standard Error	0.0	4.6	7.6	7.0
		Sample Size	2	40	22	5
Sheenjek	Female	Mean Length		579	594	623
		Standard Error		3.5	6.1	7.5
		Sample Size		54	28	2
	Male	Mean Length	550	608	625	620
		Standard Error	0.0	3.2	5.6	0.0
		Sample Size	1	69	37	1
Tanana	Female	Mean Length		548	558	578
		Standard Error		4.9	7.6	6.0
		Sample Size		28	16	3
	Male	Mean Length		574	585	627
		Standard Error		5.7	6.9	30.9
		Sample Size		25	22	3

^a All samples were from carcasses except from Sheenjek River which were from live fish captured with beach seine.

Table 14. Harvest of Yukon River coho salmon by age, sex, and fishery, 1993.

District	Fishery	Sample Size	Sex	Brood Year and Age Group ^a			Total
				1990	1989	1988	
				1.1	2.1	3.1	
1	Subsistence Gillnet ^b		Female	180	920	18	1,118
			Male	184	1,037	4	1,225
			Total	364	1,957	22	2,343
2	Subsistence Gillnet ^b		Female	130	666	13	809
			Male	133	750	3	886
			Total	263	1,416	16	1,695
3	Subsistence Gillnet ^b		Female	18	94	2	114
			Male	19	106	0	126
			Total	37	200	2	240
Alaska Harvest ^c			Female	328	1,680	33	2,041
			Male	336	1,893	8	2,237
			Total	664	3,573	41	4,278

^a Discrepancies in row and column addition by category are due to rounding error and may be ignored.

^b Age and sex composition is based on Big Eddy and Middle Mouth coho salmon test fishing catches combined (522).

^c District 4 (1,206), District 5 (5,984), District 6 (4,304), Canada (60), and sport fish (897) harvests were not included due to insufficient samples.

Table 15. Age and sex composition of Yukon River coho salmon escapement samples, 1993.

		Brood Year and Age Group		Total
		1990	1989	
		1.1	2.1	
Location: Delta Clearwater River				
Escapement:		10,875		
Sample Dates:		11/8		
Sample Size:		275		
Female	Sample Size	74	58	132
	Percent of Sample	26.9	21.1	48.0
Male	Sample Size	98	45	143
	Percent of Sample	35.6	16.4	52.0
Total	Sample Size	172	103	275
	Percent of Sample	62.5	37.5	100.0
	Standard Error	2.9	2.9	

Table 16. Length (mm measured from mid-orbit to fork-of-tail) by age and sex of Yukon River coho salmon escapement samples, 1993.

River	Sex		Brood Year and Age Group	
			1990	1989
			1.1	2.1
Delta Clearwater	Female	Mean Length	550	553
		Standard Error	3.1	3.6
		Sample Size	74	58
	Male	Mean Length	541	533
		Standard Error	4.4	6.6
		Sample Size	98	45

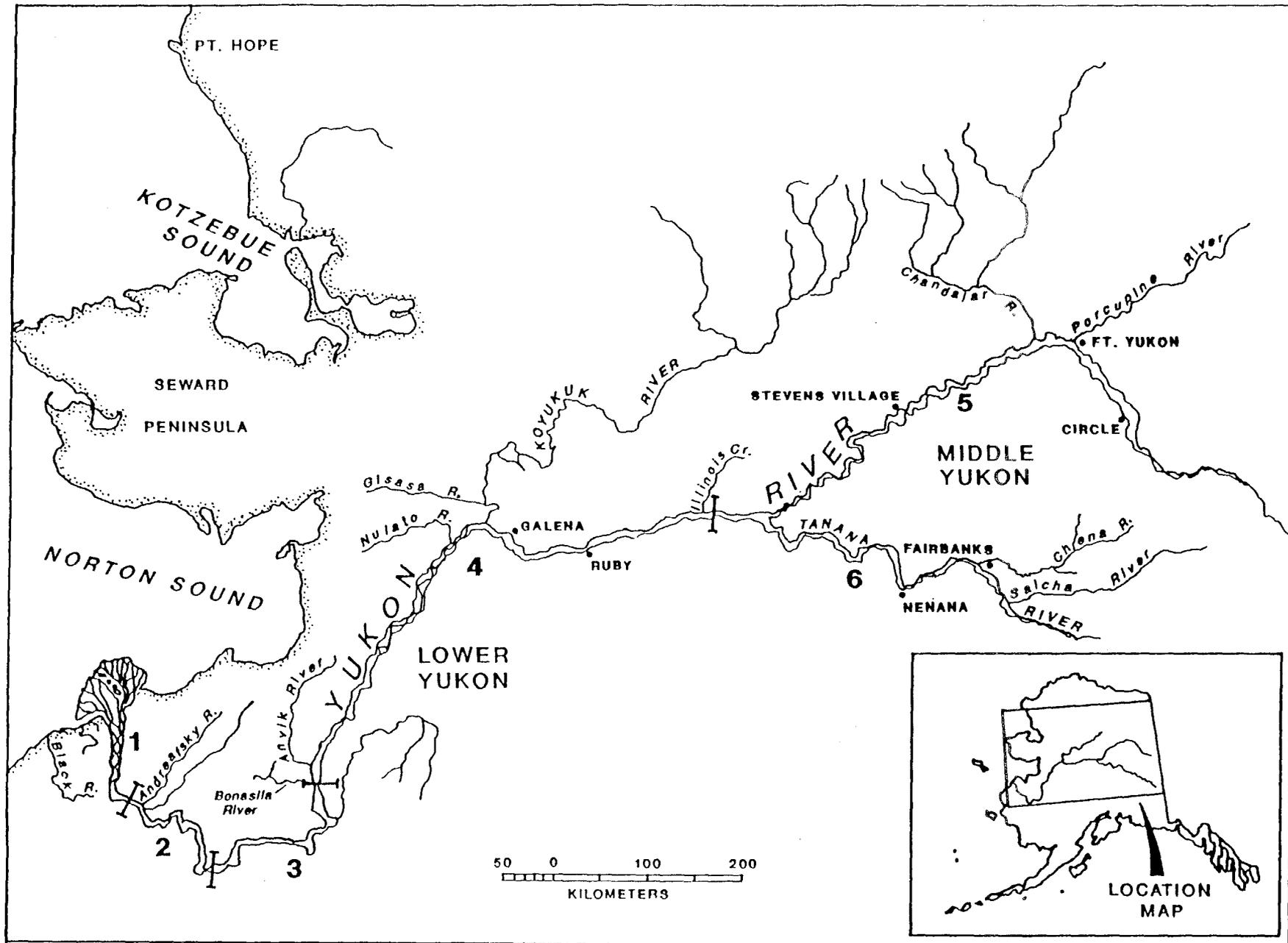


Figure 1. Alaskan portion of the Yukon River with fishing district boundaries.

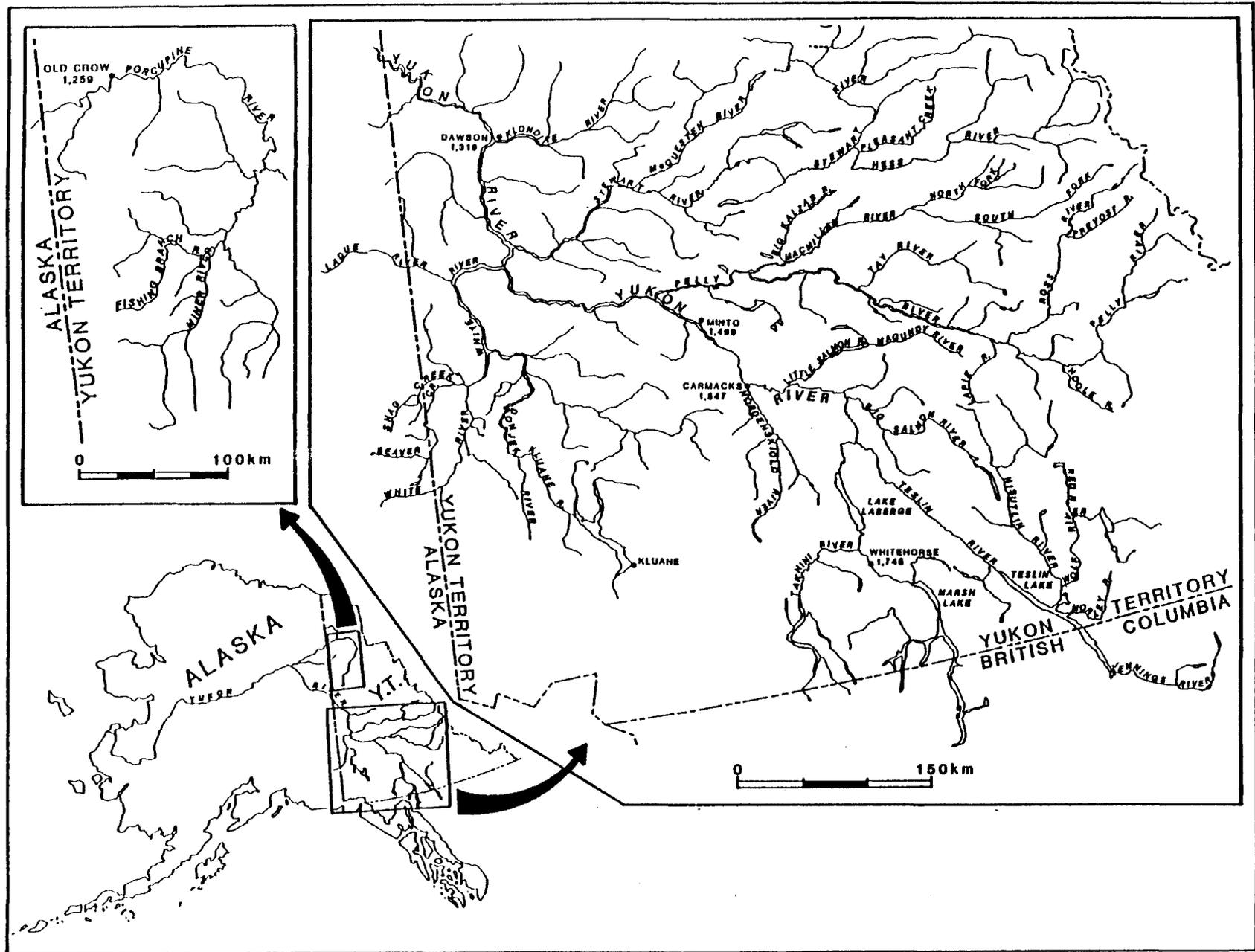


Figure 2. Canadian portion of the Yukon River drainage.

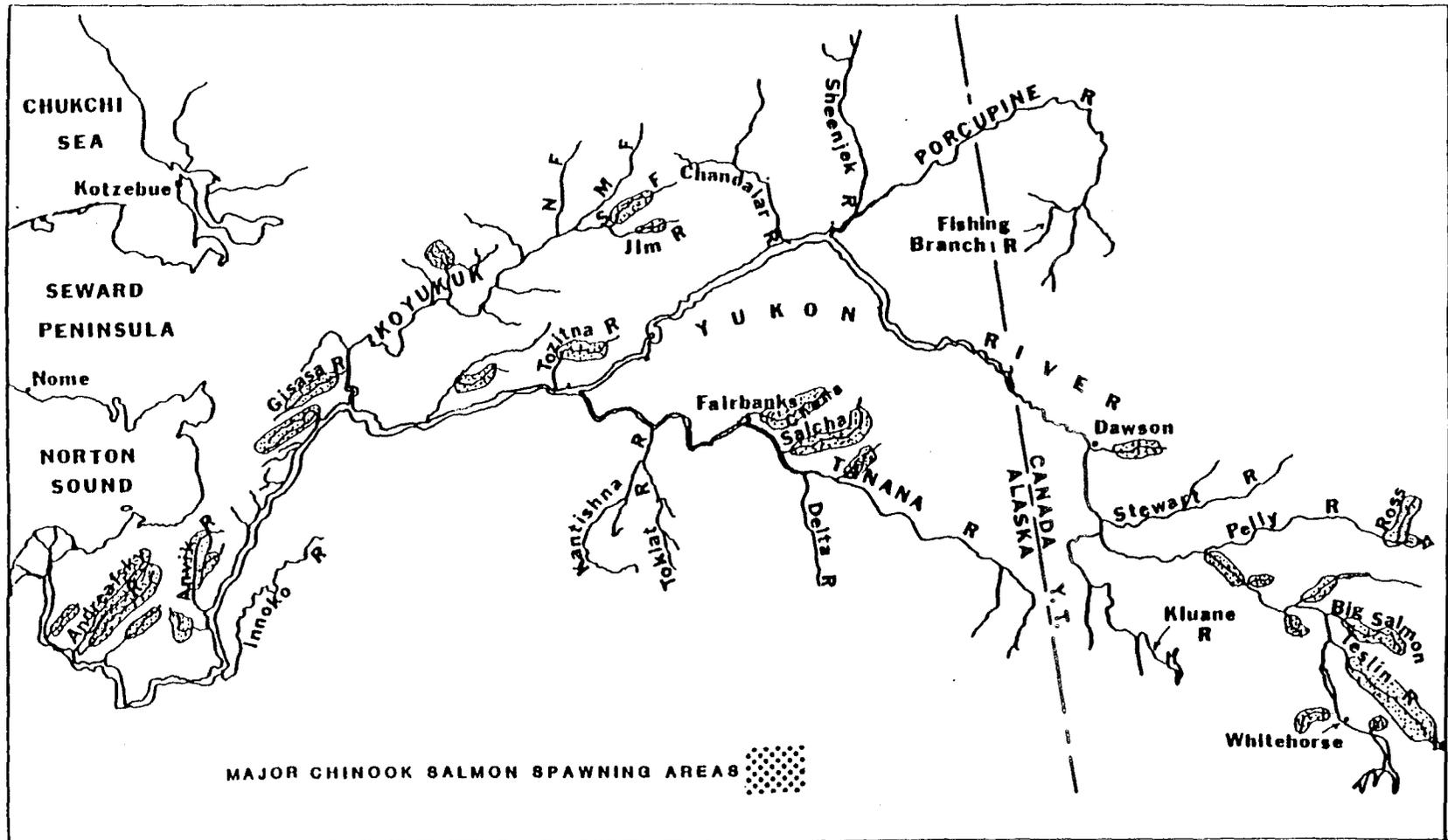


Figure 3. Chinook salmon spawning areas in the Yukon River drainage.

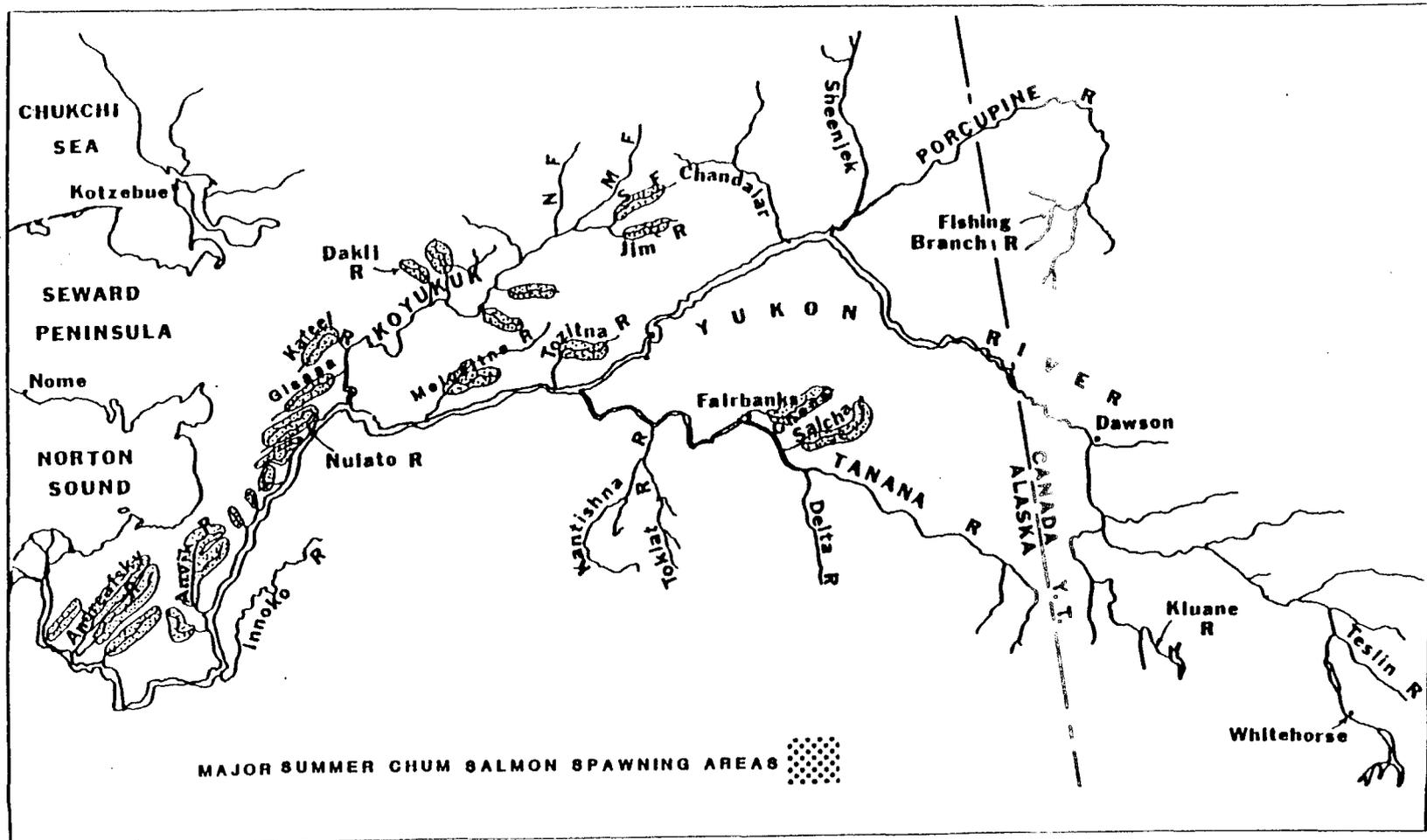


Figure 4. Summer chum salmon spawning areas in the Yukon River drainage.

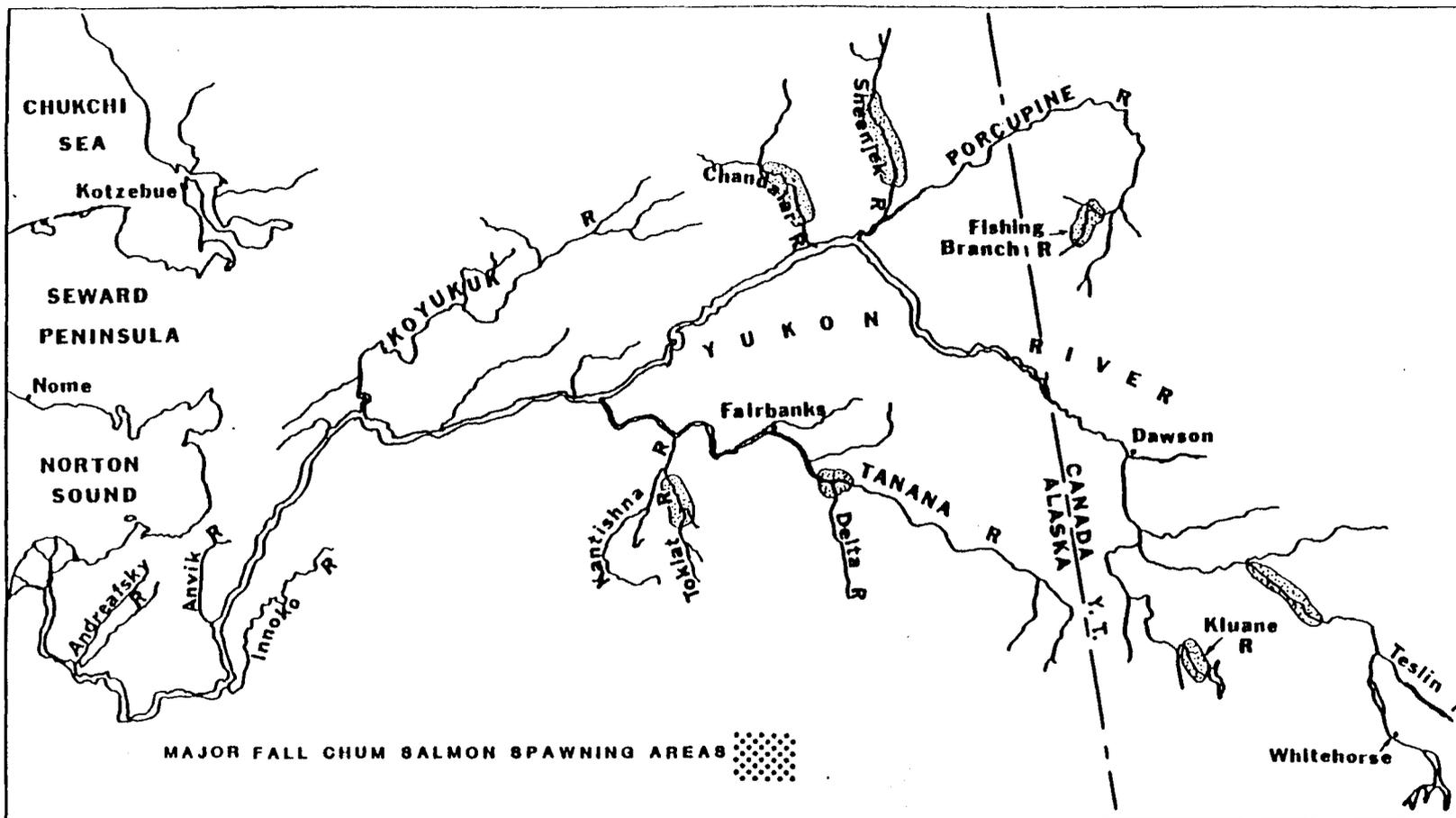


Figure 5. Fall chum salmon spawning areas in the Yukon River drainage.

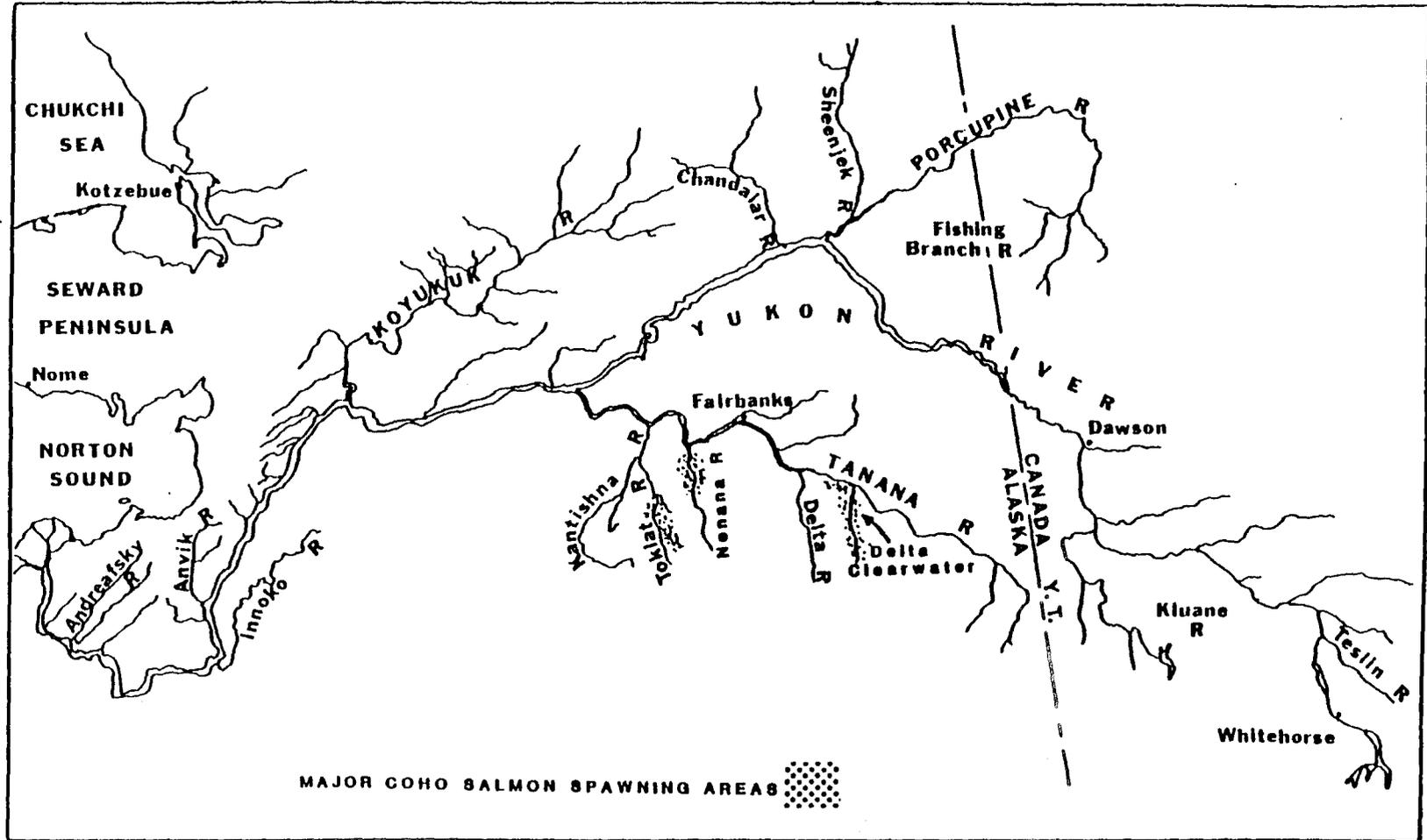


Figure 6. Coho salmon spawning areas in the Yukon River drainage.

APPENDIX

Appendix A.1. Yukon River District 1 commercial salmon catch by period, 1993.

Period No.	Period Dates	Hours Fished	No. of Fishers	Period Catch and Catch Per Unit Effort						Cumulative Catch and Catch Per Unit Effort					
				Chinook	CPUE	Coho	CPUE	Chum	CPUE	Chinook	CPUE	Coho	CPUE	Chum	CPUE
1	6/14-6/15	12	404	9,126	1.88	0	0.00	2,235	0.46	9,126	1.88	0	0.00	2,235	0.46
2	6/17-6/18	12	431	23,020	4.45	0	0.00	9,568	1.85	32,146	3.21	0	0.00	11,803	1.18
3	6/21	6	429	10,426	4.05	0	0.00	5,224	2.03	42,572	3.38	0	0.00	17,027	1.35
5	6/28	6	383	2,923	1.27	0	0.00	3,151	1.37	45,495	3.05	0	0.00	20,178	1.35
6	7/01	6	318	1,589	0.83	0	0.00	7,978	4.18	47,084	2.80	0	0.00	28,156	1.68
Subtotal ^{a, b}		42	448	47,084	2.80	0	0.00	28,156	1.68						
4 ^c	6/24	6	396	2,202	0.93	0	0.00	45,503	19.15	2,202	0.93	0	0.00	45,503	19.15
Season Total		48	448	49,286	2.57	0	0.00	73,659	3.84						

^a Catches reported in numbers of fish sold in the round. Cumulative CPUE is by gear restriction.

^b No mesh size restrictions.

^c Mesh size restricted to 6 in (15.2 cm) or less during period 4.

Appendix A.2. Yukon River District 2 commercial salmon catch by period, 1993.

Period No.	Period Dates	Hours Fished	No. of Fishers	Period Catch and Catch Per Unit Effort						Cumulative Catch and Catch Per Unit Effort					
				Chinook	CPUE	Coho	CPUE	Chum	CPUE	Chinook	CPUE	Coho	CPUE	Chum	CPUE
1	6/16-6/17	12	225	10,570	3.91	0	0.00	1,938	0.72	10,570	3.91	0	0.00	1,938	0.72
2	6/20-6/21	12	226	14,105	5.20	0	0.00	5,243	1.93	24,675	4.56	0	0.00	7,181	1.33
3	6/25	6	223	6,838	5.11	0	0.00	3,951	2.95	31,513	4.67	0	0.00	11,132	1.65
4	6/27	6	213	3,161	2.47	0	0.00	3,652	2.86	34,674	4.32	0	0.00	14,784	1.84
5	6/30	6	206	2,619	2.12	0	0.00	4,548	3.68	37,293	4.03	0	0.00	19,332	2.09
Total ^{a, b}		42	238	37,293	4.03	0	0.00	19,332	2.09						

^a Catches reported in numbers of fish sold in the round.

^b No mesh size restrictions.

Appendix A.3. Yukon River District 3 commercial salmon catch by period, 1993.

Period No.	Period Dates	Hours Fished	No. of Fishers	Period Catch and Catch Per Unit Effort						Cumulative Catch and Catch Per Unit Effort					
				Chinook	CPUE	Coho	CPUE	Chum	CPUE	Chinook	CPUE	Coho	CPUE	Chum	CPUE
1	6/20-6/21	12	5	191	3.18	0	0.00	29	0.48	191	3.18	0	0.00	29	0.48
2	6/23-6/24	12	6	512	7.11	0	0.00	86	1.19	703	5.33	0	0.00	115	0.87
3	6/25	6	5	392	13.07	0	0.00	65	2.17	1,095	6.76	0	0.00	180	1.11
4	6/27	6	5	296	9.87	0	0.00	191	6.37	1,391	7.24	0	0.00	371	1.93
5	6/30	6	5	110	3.67	0	0.00	92	3.07	1,501	6.76	0	0.00	463	2.09
Total ^{a, b}		42	6	1,501	6.76	0	0.00	463	2.09						

^a Catches reported in numbers of fish sold in the round.

^b No mesh size restrictions.

Appendix A.4. Yukon River District 4 commercial salmon catch by period, 1993.

Period	Period Dates	Hours Fished	Number of Fishers	Chinook				Summer Chum			
				Sold in Round	Pounds of Roe	Roe Weight ^a	Estimated Harvest ^b	Sold in Round	Pounds of Roe	Roe Weight ^c	Estimated Harvest ^d
Subdistrict 4A											
1	7/11–7/12	12	51	0	0		0	0	8,942	0.85	16,698
2	7/14–7/15	9	52	0	0		0	0	11,543	0.85	21,498
Subtotal		21	53	0	0		0	0	20,485		38,196
Subdistricts 4B and 4C											
1	6/27–6/28	24	14	272	62	2.25	300	0	80	0.91	166
2	6/30–7/02	48	20	590	196	2.94	669	0	349	0.87	918
3	7/04–7/06	48	20	487	337	3.15	575	27	1,126	0.94	2,634
4	7/14–7/15	24	15	0	106	3.18	33	0	407	0.71	1,043
Subtotal		144	23	1,349	701		1,577	27	1,962		4,761
Season Total				1,349	701		1,577	27	22,447		42,957

^a Weighted average of pounds of roe per female sampled from set gillnets and fish wheels.

^b Estimated harvest is the number of fish sold in the round plus the estimated females harvested to produce roe sold.

^c In Subdistrict 4A average pounds of roe per female sampled from fish wheels. In Subdistricts 4B and 4C weighted average of pounds of roe per female sampled from set gillnets and fish wheels.

^d Estimated harvest is the number of fish sold in the round plus the estimated males and females harvested to produce roe sold.

Appendix A.5. Yukon River District 5 commercial salmon catch by period, 1993.

Period	Period Dates	Hours Fished	Number of Fishers	Chinook ^a	Summer Chum
Subdistricts 5A, 5B, and 5C					
1	7/02-7/04	36	26	1,298	0
2	7/06-7/07	24	24	1,310	0
Subtotal		60	27	2,608	0
Subdistrict 5D					
1	7/09-7/11	48	3	147	0
2	7/13-7/15	36	3	253	0
Subtotal		84	3	400	0
Season Total		144	30	3,008	0

^a All fish sales were in the round.

Appendix A.6. Yukon River District 6 commercial salmon catch by period, 1993.

Period	Period Dates	Hours Fished	Number of Fishers	Chinook				Summer Chum			
				Sold in Round	Pounds of Roe	Roe Weight ^a	Estimated Harvest ^b	Sold in Round	Pounds of Roe	Roe Weight ^a	Estimated Harvest ^{b,c}
1	7/12–7/14	42	14	666	880	3.82	896	928	219	0.77	1,212
2	7/19–7/21	42	16	447	433	4.26	549	2,113	296	0.78	2,492
Season Total		84	18	1,113	1,313		1,445	3,041	515		3,705

^a Estimated average roe weight, in pounds per female, is a weighted period average based on the commercial season sampling program.

^b Estimated harvest is the number of fish sold in the round plus the estimated females harvested to produce roe sold.

^c Discrepancy in column addition is due to rounding error and may be ignored.

Appendix A.7. Canadian Yukon River commercial salmon catch by week, 1993.

Week	Days Fished	Number of Fishers	Chinook		Fall Chum	
			Weekly	Cum.	Weekly	Cum.
6/27-7/03	1	7	34	34	0	0
7/04-7/10	1	10	170	204	0	0
7/11-7/17	3	15	1,781	1,985	0	0
7/18-7/24	4	17	3,154	5,139	3	3
7/25-7/31	4	17	2,971	8,110	10	13
8/01-8/07	4	17	1,444	9,554	9	22
8/08-8/14	3	11	407	9,961	16	38
8/15-8/21	2	1	15	9,976	9	47
8/22-8/28	1	3	4	9,980	93	140
8/29-9/04	2	10	6	9,986	946	1,086
9/05-9/11	2	13	2	9,988	2,656	3,742
9/12-9/18	1	11	0	9,988	1,925	5,667
9/19-9/25	1	10	0	9,988	2,095	7,762
Subtotal	29			9,988		7,762
Upriver Subtotal				362		0
Total Canada Catch				10,350		7,762

Appendix B.1. Yukon River chinook salmon commercial and subsistence gillnet (GN) and fish wheel (FW) catch by district, 1993.

District	Commercial Catch			Subsistence Catch			Total Catch		
	GN	FW	Total	GN	FW	Total	GN	FW	Total
1 ^a	50,694		50,694	10,423		10,423	61,117		61,117
2 ^b	37,457		37,457	11,516		11,516	48,973		48,973
3	1,501		1,501	6,474		6,474	7,975		7,975
4A ^c	0	0	0	1,243	4,826	6,069	1,243	4,826	6,069
4B, 4C	323	1,254	1,577	1,223	4,750	5,973	1,546	6,004	7,550
4 Total ^d	323	1,254	1,577	2,466	9,576	12,042	2,789	10,830	13,619
5A, 5B, 5C	1,351	1,257	2,608	3,539	3,293	6,832	4,890	4,550	9,440
5D ^f	37	363	400	1,413	13,866	15,279	1,450	14,229	15,679
5 Total ^d	1,388	1,620	3,008	4,952	17,159	22,111	6,340	18,779	25,119
6 ^d	24	1,421	1,445	52	3,082	3,134	76	4,503	4,579
Sport Fish (Alaska)									1,695
Alaska Total	91,387	4,295	95,682	35,884	29,816	65,700	127,271	34,111	163,077
Porcupine Mainstem Yukon Sport Fish	10,350		10,350	5,819	142	5,819	16,169		16,169
Canada Total ^g	10,350		10,350	5,961		5,961	16,311		16,611
Yukon R. Total	101,737	4,295	106,032	41,845	29,816	71,661	143,582	34,111	179,688

^a Total includes ADF&G test fish sales (1,408). Total does not include Hooper Bay (230) and Scammon Bay (1,199) subsistence catches.

^b Total includes ADF&G test fish sales (164).

^c Total includes Innoko River (128) and Koyukuk River (460) subsistence catches.

^d Catch by gear type for subsistence fisheries is estimated in Districts 4, 5, and 6 using the proportion caught by gear type in the commercial fisheries.

^f Total includes Chandalar River subsistence catch (2,716).

^g Catch by gear type in Yukon Territory is not known, it is believed most fish are taken in gillnets (JTC 1993).

Appendix B.2. Yukon River summer chum salmon commercial and subsistence gillnet (GN) and fish wheel (FW) catch by district, 1993.

District	Commercial Harvest															
	Fish Sold in the Round			Pounds of Roe			Estimated Harvest			Subsistence Catch			Total			
	GN	FW	Total	GN	FW	Total	GN	FW	Total	GN	FW	Total	GN	FW	Total	
1 ^a	75,038		75,038				75,038		75,038	34,285		34,285	109,323		109,323	
2 ^b	19,822		19,822				19,822		19,822	25,417		25,417	45,239		45,239	
3	463		463				463		463	3,376		3,376	3,839		3,839	
4A ^c	0	0	0	6,117	14,368	20,485	11,406	26,790	38,196	6,069	14,254	20,323	17,475	41,044	58,519	
4B, 4C	0	27	27	44	1,918	1,962	107	4,654	4,761	88	3,848	3,936	195	8,502	8,697	
4 Total ^{d, f}	0	27	27	6,161	16,286	22,447	11,513	31,444	42,957	6,157	18,102	24,259	17,670	49,546	67,216	
5A, 5B, 5C	0	0	0	0	0	0	0	0	0	3,211	2,988	6,199	3,211	2,988	6,199	
5D ^g	0	0	0	0	0	0	0	0	0	467	4,579	5,046	467	4,579	5,046	
5 Total ^{f, h}	0	0	0	0	0	0	0	0	0	3,678	7,567	11,245	3,678	7,567	11,245	
6 ^{f, h}	409	2,632	3,041	0	515	515	409	3,296	3,705	825	6,647	7,472	1,234	9,943	11,177	
Sport Fish																564
Alaska Total	95,732	2,659	98,391	6,161	16,801	22,962	107,245	34,740	141,985	73,738	32,316	106,054	180,983	67,056	248,603	

^a Total includes ADF&G test fish sales (1,379). Total does not include Hooper Bay (16,106) and Scammon Bay (4,692) subsistence catches.

^b Total includes ADF&G test fish sales (490).

^c Total includes Innoko River (4,183) and Koyukuk River (11,907) subsistence catches.

^d Total removal in commercial related harvest is the number of fish sold in the round plus the estimated number of males and females harvested to produce roe sold.

^f Catch by gear type for subsistence fisheries is estimated in Districts 4, 5, and 6 using the proportion caught by gear type in the commercial fisheries. For District 5 the commercial chinook catch proportions were used.

^g Total includes Chandalar River subsistence catch (129).

^h Total removal in commercial related harvest is the number of fish sold in the round plus the estimated number of females harvested to produce roe sold.

Appendix B.3. Yukon River fall chum salmon commercial and subsistence gillnet (GN) and fish wheel (FW) catch by district, 1993.

District	Commercial Catch ^a			Subsistence Catch ^b			Total Catch		
	GN	FW	Total	GN	FW	Total	GN	FW	Total
1 ^c				7,770		7,770	7,770		7,770
2				3,094		3,094	3,094		3,094
3				1,238		1,238	1,238		1,238
4 ^d						11,043			11,043
5 ^f						43,764			43,764
6						10,179			10,179
Alaska Total				12,102		77,088	12,102		77,088
Porcupine				1,668		1,668	1,668		1,668
Mainstem Yukon	5,433	2,329	7,762	3,262	1,398	4,660	8,695	3,727	12,422
Canada Total^g	5,433	2,329	7,762	4,930	1,398	6,328	10,363	3,727	14,090
Yukon R. Total	5,433	2,329	7,762	17,032	1,398	83,416	22,465	3,727	91,178

^a No commercial fall season in Districts 1–6.

^b Catch by gear type for subsistence fisheries in Districts 4, 5, 6 was not available.

^c Total does not include Hooper Bay (113) and Scammon Bay (7) subsistence catches.

^d Total includes Innoko River (211) and Koyukuk River (662) subsistence catches.

^f Total includes Black River (475) and Chandalar River (7,881) subsistence catches.

^g Catch by gear type in Yukon Territory is not known; it is believed the catch is approximately 70% gillnet and 30% fish wheel in the mainstem Yukon River fishery (JTC 1993).

Appendix B.4. Yukon River coho salmon commercial and subsistence gillnet (GN) and fish wheel (FW) catch by district, 1993.

District	Commercial Catch ^a			Subsistence Catch ^b			Total Catch		
	GN	FW	Total	GN	FW	Total	GN	FW	Total
1 ^c				2,343		2,343	2,343		2,343
2				1,695		1,695	1,695		1,695
3				240		240	240		240
4 ^d						1,206			1,206
5 ^f						5,984			5,984
6						4,304			4,304
Sport Fish (Alaska)									897
Alaska Total				4,278		15,772	4,278		16,669
Porcupine River ^g				60		60	60		60
Yukon River Total				4,338		15,832	4,338		16,729

^a No commercial fall season.

^b Catch by gear type for subsistence fisheries in Districts 4, 5, and 6 was not available.

^c Total does not include Scammon Bay subsistence catch (40).

^d Total includes Innoko River (39) and Koyukuk River (15) subsistence catches.

^f Total includes Chandalar River subsistence catch (135).

^g Coho salmon are caught usually by fishing in late October and November under the ice.

Appendix C.1. Chena River counting tower daily expanded estimates of chinook and summer chum salmon counts, 1993.

Date	Chinook Salmon		Summer Chum Salmon	
	Estimate ^a	Cumulative	Estimate ^a	Cumulative
01-Jul	81	81	0	0
02-Jul	78	159	0	0
03-Jul	194	353	0	0
04-Jul	77	430	0	0
05-Jul	405	835	0	0
06-Jul	224	1,059	9	9
07-Jul	432	1,491	9	18
08-Jul	243	1,734	6	24
09-Jul	297	2,031	0	24
10-Jul	612	2,643	9	33
11-Jul	828	3,471	105	138
12-Jul	1,013	4,484	72	210
13-Jul	1,157	5,641	158	368
14-Jul	900	6,541	84	452
15-Jul	867	7,408	90	542
16-Jul	882	8,290	149	691
17-Jul	248	8,538	90	781
18-Jul	651	9,189	111	892
19-Jul	338	9,527	113	1,005
20-Jul	792	10,319	90	1,095
21-Jul	492	10,811	255	1,350
22-Jul	339	11,150	426	1,776
23-Jul	312	11,462	462	2,238
24-Jul	145	11,607	261	2,499
25-Jul	95	11,702	178	2,677
26-Jul	95	11,797	320	2,997
27-Jul	131	11,928	270	3,267
28-Jul	75	12,003	315	3,582
29-Jul	57	12,060	153	3,735
30-Jul	51	12,111	180	3,915
31-Jul	14	12,125	144	4,059
01-Aug	27	12,152	194	4,253
02-Aug	32	12,184	185	4,438
03-Aug	18	12,202	108	4,546
04-Aug	9	12,211	230	4,776
05-Aug	18	12,229	351	5,127
06-Aug	9	12,238	240	5,367
07-Aug	9	12,247	36	5,403
Total ^b	12,247		5,403	

^a Estimates are made from 20 minute counts each hour with the counting period ranging from 16 to 24 hours each day. The estimate is the actual daily count expanded over 24 hours.

^b The final estimates were reported in text (Skaugstad 1994) as 12,241 chinook salmon and 5,400 summer chum salmon. In the text the final estimate for each species was calculated by expanding the total count (sum of all 20 minute counts) over the entire season.

Appendix C.2. Salcha River counting tower daily expanded estimates of chinook and summer chum salmon counts, 1993.

Date	Chinook Salmon		Summer Chum Salmon	
	Estimate ^a	Cumulative	Estimate ^a	Cumulative
01-Jul	63	63	0	0
02-Jul	36	99	0	0
03-Jul	41	140	0	0
04-Jul	78	218	0	0
05-Jul	27	245	0	0
06-Jul	158	403	0	0
07-Jul	264	667	0	0
08-Jul	300	967	15	15
09-Jul	342	1,309	9	24
10-Jul	212	1,521	32	56
11-Jul	663	2,184	57	113
12-Jul	900	3,084	126	239
13-Jul	896	3,980	68	307
14-Jul	636	4,616	126	433
15-Jul	582	5,198	153	586
16-Jul	576	5,774	162	748
17-Jul	257	6,031	41	789
18-Jul	240	6,271	87	876
19-Jul	1,013	7,284	126	1,002
20-Jul	432	7,716	257	1,259
21-Jul	588	8,304	411	1,670
22-Jul	396	8,700	279	1,949
23-Jul	378	9,078	396	2,345
24-Jul	195	9,273	453	2,798
25-Jul	194	9,467	378	3,176
26-Jul	50	9,517	54	3,230
27-Jul	131	9,648	167	3,397
28-Jul	87	9,735	198	3,595
29-Jul	50	9,785	72	3,667
30-Jul	32	9,817	68	3,735
31-Jul	57	9,874	288	4,023
01-Aug	45	9,919	167	4,190
02-Aug	38	9,957	404	4,594
03-Aug	27	9,984	230	4,824
04-Aug	14	9,998	239	5,063
05-Aug	15	10,013	309	5,372
06-Aug	0	10,013	222	5,594
07-Aug	0	10,013	153	5,747
08-Aug	0	10,013	68	5,815
Total ^b	10,013		5,815	

^a Estimates are made from 20 minute counts each hour with the counting period ranging from 16 to 24 hours each day. The estimate is the actual daily count expanded over 24 hours.

^b The final estimates were reported in text (Skaugstad 1994) as 10,007 chinook salmon and 5,809 summer chum salmon. In the text the final estimate for each species was calculated by expanding the total count (sum of all 20 minute counts) over the entire season.

Appendix C.3. Canadian Yukon River chinook salmon fish wheel catches, 1993.

Date	White Rock		Sheep Rock		Total			
	Count	Cum.	Count	Cum.	Count	Prop.	Cum.	Prop.
23-Jun	0	0	1	1	1	0.0008	1	0.0008
24-Jun	2	2	1	2	3	0.0024	4	0.0032
25-Jun	1	3	0	2	1	0.0008	5	0.0040
26-Jun	1	4	1	3	2	0.0016	7	0.0056
27-Jun	4	8	3	6	7	0.0056	14	0.0113
28-Jun	4	12	1	7	5	0.0040	19	0.0153
29-Jun	2	14	5	12	7	0.0056	26	0.0210
30-Jun	6	20	2	14	8	0.0064	34	0.0274
01-Jul	9	29	9	23	18	0.0145	52	0.0419
02-Jul	10	39	9	32	19	0.0153	71	0.0572
03-Jul	26	65	9	41	35	0.0282	106	0.0854
04-Jul	13	78	10	51	23	0.0185	129	0.1039
05-Jul	19	97	8	59	27	0.0218	156	0.1257
06-Jul	21	118	13	72	34	0.0274	190	0.1531
07-Jul	16	134	12	84	28	0.0226	218	0.1757
08-Jul	34	168	29	113	63	0.0508	281	0.2264
09-Jul	22	190	8	121	30	0.0242	311	0.2506
10-Jul	21	211	13	134	34	0.0274	345	0.2780
11-Jul	15	226	17	151	32	0.0258	377	0.3038
12-Jul	24	250	17	168	41	0.0330	418	0.3368
13-Jul	25	275	12	180	37	0.0298	455	0.3666
14-Jul	24	299	15	195	39	0.0314	494	0.3981
15-Jul	20	319	18	213	38	0.0306	532	0.4287
16-Jul	14	333	19	232	33	0.0266	565	0.4553
17-Jul	13	346	13	245	26	0.0210	591	0.4762
18-Jul	14	360	23	268	37	0.0298	628	0.5060
19-Jul	18	378	14	282	32	0.0258	660	0.5318
20-Jul	16	394	20	302	36	0.0290	696	0.5608
21-Jul	19	413	15	317	34	0.0274	730	0.5882
22-Jul	7	420	12	329	19	0.0153	749	0.6035
23-Jul	16	436	34	363	50	0.0403	799	0.6438
24-Jul	18	454	20	383	38	0.0306	837	0.6745
25-Jul	13	467	11	394	24	0.0193	861	0.6938
26-Jul	14	481	19	413	33	0.0266	894	0.7204
27-Jul	15	496	21	434	36	0.0290	930	0.7494
28-Jul	9	505	15	449	24	0.0193	954	0.7687
29-Jul	17	522	13	462	30	0.0242	984	0.7929
30-Jul	17	539	9	471	26	0.0210	1010	0.8139
31-Jul	32	571	17	488	49	0.0395	1059	0.8533

-Continued-

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Date	White Rock		Sheep Rock		Total			
	Count	Cum.	Count	Cum.	Count	Prop.	Cum.	Prop.
01-Aug	17	588	9	497	26	0.0210	1085	0.8743
02-Aug	17	605	10	507	27	0.0218	1112	0.8961
03-Aug	6	611	8	515	14	0.0113	1126	0.9073
04-Aug	7	618	1	516	8	0.0064	1134	0.9138
05-Aug	8	626	2	518	10	0.0081	1144	0.9218
06-Aug	14	640	4	522	18	0.0145	1162	0.9363
07-Aug	6	646	3	525	9	0.0073	1171	0.9436
08-Aug	5	651	6	531	11	0.0089	1182	0.9525
09-Aug	4	655	2	533	6	0.0048	1188	0.9573
10-Aug	5	660	1	534	6	0.0048	1194	0.9621
11-Aug	4	664	0	534	4	0.0032	1198	0.9654
12-Aug	4	668	1	535	5	0.0040	1203	0.9694
13-Aug	5	673	0	535	5	0.0040	1208	0.9734
14-Aug	1	674	0	535	1	0.0008	1209	0.9742
15-Aug	4	678	2	537	6	0.0048	1215	0.9790
16-Aug	3	681	1	538	4	0.0032	1219	0.9823
17-Aug	2	683	0	538	2	0.0016	1221	0.9839
18-Aug	0	683	0	538	0	0.0000	1221	0.9839
19-Aug	2	685	0	538	2	0.0016	1223	0.9855
20-Aug	1	686	0	538	1	0.0008	1224	0.9863
21-Aug	1	687	0	538	1	0.0008	1225	0.9871
22-Aug	1	688	0	538	1	0.0008	1226	0.9879
23-Aug	0	688	1	539	1	0.0008	1227	0.9887
24-Aug	1	689	0	539	1	0.0008	1228	0.9895
25-Aug	1	690	0	539	1	0.0008	1229	0.9903
26-Aug	1	691	1	540	2	0.0016	1231	0.9919
27-Aug	2	693	0	540	2	0.0016	1233	0.9936
28-Aug	1	694	0	540	1	0.0008	1234	0.9944
29-Aug	0	694	0	540	0	0.0000	1234	0.9944
30-Aug	0	694	0	540	0	0.0000	1234	0.9944
31-Aug	0	694	0	540	0	0.0000	1234	0.9944
01-Sep	5	699	0	540	5	0.0040	1239	0.9984
02-Sep	0	699	1	541	1	0.0008	1240	0.9992
03-Sep	0	699	0	541	0	0.0000	1240	0.9992
04-Sep	0	699	1	542	1	0.0008	1241	1.0000
05-Sep	0	699	0	542	0	0.0000	1241	1.0000
Total	699		542					

Appendix C.4. Whitehorse fishway chinook salmon counts, 1993.

Date	Male	Female	Daily		Cumulative	
			Count	Prop.	Count	Prop.
24-Jul	0	1	1	0.0015	1	0.0015
27-Jul	0	1	1	0.0015	2	0.0030
29-Jul	0	1	1	0.0015	3	0.0045
30-Jul	1	0	1	0.0015	4	0.0060
31-Jul	1	3	4	0.0060	8	0.0120
01-Aug	2	3	5	0.0075	13	0.0195
03-Aug	3	1	4	0.0060	17	0.0254
04-Aug	3	2	5	0.0075	22	0.0329
05-Aug	6	3	9	0.0135	31	0.0464
06-Aug	10	10	20	0.0299	51	0.0763
07-Aug	9	7	16	0.0240	67	0.1003
08-Aug	8	9	17	0.0254	84	0.1257
09-Aug	14	12	26	0.0389	110	0.1647
10-Aug	13	13	26	0.0389	136	0.2036
11-Aug	17	25	42	0.0629	178	0.2665
12-Aug	15	20	35	0.0524	213	0.3189
13-Aug	24	22	46	0.0689	259	0.3877
14-Aug	35	21	56	0.0838	315	0.4716
15-Aug	34	21	55	0.0823	370	0.5539
16-Aug	25	20	45	0.0674	415	0.6213
17-Aug	25	17	42	0.0629	457	0.6841
18-Aug	19	15	34	0.0509	491	0.7350
19-Aug	15	12	27	0.0404	518	0.7754
20-Aug	16	14	30	0.0449	548	0.8204
21-Aug	13	5	18	0.0269	566	0.8473
22-Aug	18	7	25	0.0374	591	0.8847
23-Aug	14	6	20	0.0299	611	0.9147
24-Aug	14	7	21	0.0314	632	0.9461
25-Aug	7	4	11	0.0165	643	0.9626
26-Aug	1	0	1	0.0015	644	0.9641
27-Aug	7	0	7	0.0105	651	0.9746
28-Aug	0	0	0	0.0000	651	0.9746
29-Aug	3	0	3	0.0045	654	0.9790
30-Aug	2	1	3	0.0045	657	0.9835
31-Aug	5	1	6	0.0090	663	0.9925
01-Sep	3	0	3	0.0045	666	0.9970
02-Sep	2	0	2	0.0030	668	1.0000
Total	384	284	668			

Appendix C.5. Anvik River sonar project daily adjusted summer chum salmon counts, 1993.

Date	West Bank	East Bank	Daily		Cumulative	
			Count	Prop.	Count	Prop.
19-Jun ^a	185		185	0.0004	185	0.0004
20-Jun ^b	1,063	5	1,068	0.0021	1,253	0.0024
21-Jun	4,406	6,200	10,606	0.0205	11,859	0.0229
22-Jun	5,105	459	5,564	0.0108	17,423	0.0337
23-Jun	5,203	145	5,348	0.0103	22,771	0.0440
24-Jun	1,573	667	2,240	0.0043	25,011	0.0483
25-Jun ^c	1,023	192	1,215	0.0023	26,226	0.0507
26-Jun ^c	4,139	777	4,916	0.0095	31,142	0.0602
27-Jun ^c	4,185	784	4,969	0.0096	36,111	0.0698
28-Jun ^c	3,119	584	3,703	0.0072	39,814	0.0769
29-Jun	2,147	39	2,186	0.0042	42,000	0.0812
30-Jun	5,012	290	5,302	0.0102	47,302	0.0914
01-Jul	9,299	1,995	11,294	0.0218	58,596	0.1132
02-Jul	16,417	830	17,247	0.0333	75,843	0.1466
03-Jul	12,627	1,995	14,622	0.0283	90,465	0.1748
04-Jul	20,401	1,147	21,548	0.0416	112,013	0.2165
05-Jul	18,617	1,165	19,782	0.0382	131,795	0.2547
06-Jul	17,519	861	18,380	0.0355	150,175	0.2902
07-Jul	21,260	596	21,856	0.0422	172,031	0.3325
08-Jul	11,225	958	12,183	0.0235	184,214	0.3560
09-Jul	15,709	1,309	17,018	0.0329	201,232	0.3889
10-Jul ^d	24,530	2,137	26,667	0.0515	227,899	0.4405
11-Jul	18,007	2,955	20,962	0.0405	248,861	0.4810
12-Jul	14,898	14,079	28,977	0.0560	277,838	0.5370
13-Jul	13,226	7,726	20,952	0.0405	298,790	0.5775
14-Jul	13,287	3,591	16,878	0.0326	315,668	0.6101
15-Jul	16,131	3,728	19,859	0.0384	335,527	0.6485
16-Jul	13,459	5,233	18,692	0.0361	354,219	0.6846
17-Jul	16,857	8,295	25,152	0.0486	379,371	0.7332
18-Jul	16,040	10,468	26,508	0.0512	405,879	0.7844
19-Jul	12,064	9,275	21,339	0.0412	427,218	0.8257
20-Jul	13,122	9,451	22,573	0.0436	449,791	0.8693
21-Jul	11,122	8,388	19,510	0.0377	469,301	0.9070
22-Jul	6,451	4,900	11,351	0.0219	480,652	0.9290
23-Jul	4,375	2,404	6,779	0.0131	487,431	0.9421
24-Jul	3,890	2,013	5,903	0.0114	493,334	0.9535
25-Jul	6,803	2,384	9,187	0.0178	502,521	0.9712
26-Jul	5,401	2,675	8,076	0.0156	510,597	0.9868
27-Jul	4,096	2,716	6,812	0.0132	517,409	1.0000
Total	393,993	123,416	517,409			

^a Counts initiated on the west bank on June 19 at 1500 hours.

^b Counts initiated on the east bank on June 20 at 1700 hours.

^c Counts based on the mean proportion of east bank counts on June 24 and 29.

^d Counts based on mean number of east bank counts on July 9 and 11.

Appendix C.6. Sheenjek River sonar project daily adjusted fall chum salmon counts, 1993.

Date	Daily		Cumulative	
	Count ^a	Prop.	Count	Prop.
08–Aug	45	0.0010	45	0.0010
09–Aug	95	0.0022	140	0.0033
10–Aug	256	0.0060	396	0.0092
11–Aug	143	0.0033	539	0.0126
12–Aug	217	0.0051	756	0.0176
13–Aug	227	0.0053	983	0.0229
14–Aug	175	0.0041	1,158	0.0270
15–Aug	291	0.0068	1,449	0.0338
16–Aug	346	0.0081	1,795	0.0418
17–Aug	367	0.0086	2,162	0.0504
18–Aug	245	0.0057	2,407	0.0561
19–Aug	316	0.0074	2,723	0.0634
20–Aug	466	0.0109	3,189	0.0743
21–Aug	117	0.0027	3,306	0.0770
22–Aug	124	0.0029	3,430	0.0799
23–Aug	157	0.0037	3,587	0.0836
24–Aug	177	0.0041	3,764	0.0877
25–Aug	156	0.0036	3,920	0.0913
26–Aug	248	0.0058	4,168	0.0971
27–Aug	208	0.0048	4,376	0.1020
28–Aug	296	0.0069	4,672	0.1088
29–Aug	369	0.0086	5,041	0.1174
30–Aug	647	0.0151	5,688	0.1325
31–Aug	999	0.0233	6,687	0.1558
01–Sep	1,045	0.0243	7,732	0.1801
02–Sep	632	0.0147	8,364	0.1949
03–Sep	2,092	0.0487	10,456	0.2436
04–Sep	2,557	0.0596	13,013	0.3032
05–Sep	2,097	0.0489	15,110	0.3520
06–Sep	1,673	0.0390	16,783	0.3910
07–Sep	2,414	0.0562	19,197	0.4473
08–Sep	2,720	0.0634	21,917	0.5106
09–Sep	1,300	0.0303	23,217	0.5409
10–Sep	580	0.0135	23,797	0.5544
11–Sep	401	0.0093	24,198	0.5638
12–Sep	465	0.0108	24,663	0.5746
13–Sep	373	0.0087	25,036	0.5833
14–Sep	351	0.0082	25,387	0.5915
15–Sep	197	0.0046	25,584	0.5961
16–Sep	407	0.0095	25,991	0.6055
17–Sep	1,176	0.0274	27,167	0.6329
18–Sep	1,053	0.0245	28,220	0.6575
19–Sep	1,359	0.0317	29,579	0.6891
20–Sep	1,192	0.0278	30,771	0.7169
21–Sep	3,382	0.0788	34,153	0.7957
22–Sep	2,005	0.0467	36,158	0.8424
23–Sep	1,803	0.0420	37,961	0.8844
24–Sep	1,655	0.0386	39,616	0.9230
25–Sep	1,083	0.0252	40,699	0.9482
26–Sep	1,158	0.0270	41,857	0.9752
27–Sep	568	0.0132	42,425	0.9884
28–Sep	497	0.0116	42,922	1.0000
Total	42,922			

^a Counts are adjusted by oscilloscope calibrations and expanded for 24 hours

Appendix C.7. Fishing Branch River weir fall chum salmon counts, 1993.

Date	Male	Female	Unknown	Daily Counts	Cumulative	
					Total	Percent
31-Aug ^a	16	14	0	30	30	0.1
01-Sep	55	22	0	77	107	0.4
02-Sep	119	83	2	204	311	1.1
03-Sep	172	149	0	321	632	2.2
04-Sep	234	160	0	394	1,026	3.6
05-Sep	314	343	0	657	1,683	5.8
06-Sep	204	188	6	398	2,081	7.2
07-Sep	116	110	4	230	2,311	8.0
08-Sep	321	273	1	595	2,906	10.1
09-Sep	219	188	0	407	3,313	11.5
10-Sep	262	250	2	514	3,827	13.3
11-Sep	283	310	0	593	4,420	15.3
12-Sep	273	219	0	492	4,912	17.1
13-Sep	516	462	0	978	5,890	20.5
14-Sep	581	583	0	1,164	7,054	24.5
15-Sep	617	592	0	1,209	8,263	28.7
16-Sep	650	617	0	1,267	9,530	33.1
17-Sep	688	697	0	1,385	10,915	37.9
18-Sep	437	395	0	832	11,747	40.8
19-Sep	520	556	0	1,076	12,823	44.5
20-Sep	658	773	0	1,431	14,254	49.5
21-Sep	584	643	5	1,232	15,486	53.8
22-Sep	337	405	0	742	16,228	56.4
23-Sep	226	295	0	521	16,749	58.2
24-Sep	208	247	0	455	17,204	59.7
25-Sep	267	383	0	650	17,854	62.0
26-Sep	211	326	0	537	18,391	63.9
27-Sep	162	214	0	376	18,767	65.2
28-Sep	205	298	0	503	19,270	66.9
29-Sep	191	301	0	492	19,762	68.6
30-Sep	195	247	0	442	20,204	70.2
01-Oct	211	253	0	464	20,668	71.8
02-Oct	189	350	0	539	21,207	73.6
03-Oct	206	227	0	433	21,640	75.1
04-Oct	256	290	0	546	22,186	77.0
05-Oct	286	365	0	651	22,837	79.3
06-Oct	246	282	0	528	23,365	81.1
07-Oct	289	443	0	732	24,097	83.7
08-Oct	250	355	0	605	24,702	85.8
09-Oct	173	283	0	456	25,158	87.4
10-Oct	195	349	0	544	25,702	89.2
11-Oct	132	226	0	358	26,060	90.5
12-Oct	113	192	0	305	26,365	91.6
13-Oct	101	156	0	257	26,622	92.4

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Date	Male	Female	Unknown	Daily Counts	Cumulative	
					Total	Percent
14-Oct	130	177	0	307	26,929	93.5
15-Oct	163	195	0	358	27,287	94.8
16-Oct	125	142	0	267	27,554	95.7
17-Oct	102	158	0	260	27,814	96.6
18-Oct	121	201	0	322	28,136	97.7
19-Oct	85	163	0	248	28,384	98.6
20-Oct	50	87	0	137	28,521	99.0
21-Oct	42	88	0	130	28,651	99.5
22-Oct	20	28	0	48	28,699	99.7
23-Oct	17	22	0	39	28,738	99.8
24-Oct	18	17	0	35	28,773	99.9
25-Oct ^b	9	16	0	25	28,798	100.0
Total	13,370	15,408	20	28,798		

^a Weir fish tight as of 1800 hours.

^b Weir pulled October 25 at 1000 hours.

Appendix C.8. Canadian Yukon River fall chum salmon fish wheel catches, 1993.

Date	White Rock		Sheep Rock		Total			
	Count	Cum.	Count	Cum.	Count	Prop.	Cum.	Prop.
22-Jul	0	0	0	0	0	0.0000	0	0.0000
23-Jul	0	0	2	2	2	0.0010	2	0.0010
24-Jul	0	0	0	2	0	0.0000	2	0.0010
25-Jul	1	1	0	2	1	0.0005	3	0.0015
26-Jul	0	1	0	2	0	0.0000	3	0.0015
27-Jul	0	1	0	2	0	0.0000	3	0.0015
28-Jul	0	1	1	3	1	0.0005	4	0.0020
29-Jul	3	4	0	3	3	0.0015	7	0.0035
30-Jul	0	4	0	3	0	0.0000	7	0.0035
31-Jul	1	5	0	3	1	0.0005	8	0.0040
01-Aug	1	6	0	3	1	0.0005	9	0.0045
02-Aug	0	6	0	3	0	0.0000	9	0.0045
03-Aug	0	6	0	3	0	0.0000	9	0.0045
04-Aug	1	7	1	4	2	0.0010	11	0.0055
05-Aug	1	8	1	5	2	0.0010	13	0.0065
06-Aug	3	11	1	6	4	0.0020	17	0.0084
07-Aug	0	11	0	6	0	0.0000	17	0.0084
08-Aug	2	13	0	6	2	0.0010	19	0.0094
09-Aug	0	13	2	8	2	0.0010	21	0.0104
10-Aug	0	13	0	8	0	0.0000	21	0.0104
11-Aug	2	15	0	8	2	0.0010	23	0.0114
12-Aug	4	19	0	8	4	0.0020	27	0.0134
13-Aug	2	21	0	8	2	0.0010	29	0.0144
14-Aug	4	25	0	8	4	0.0020	33	0.0164
15-Aug	4	29	0	8	4	0.0020	37	0.0184
16-Aug	0	29	1	9	1	0.0005	38	0.0189
17-Aug	4	33	0	9	4	0.0020	42	0.0209
18-Aug	4	37	2	11	6	0.0030	48	0.0239
19-Aug	3	40	0	11	3	0.0015	51	0.0253
20-Aug	1	41	3	14	4	0.0020	55	0.0273
21-Aug	3	44	4	18	7	0.0035	62	0.0308
22-Aug	8	52	2	20	10	0.0050	72	0.0358
23-Aug	5	57	4	24	9	0.0045	81	0.0403
24-Aug	26	83	4	28	30	0.0149	111	0.0552
25-Aug	13	96	7	35	20	0.0099	131	0.0651
26-Aug	11	107	7	42	18	0.0089	149	0.0741
27-Aug	8	115	9	51	17	0.0084	166	0.0825
28-Aug	8	123	4	55	12	0.0060	178	0.0885
29-Aug	7	130	8	63	15	0.0075	193	0.0959
30-Aug	4	134	7	70	11	0.0055	204	0.1014
31-Aug	28	162	20	90	48	0.0239	252	0.1252
01-Sep	12	174	11	101	23	0.0114	275	0.1367
02-Sep	20	194	13	114	33	0.0164	308	0.1531
03-Sep	28	222	25	139	53	0.0263	361	0.1794
04-Sep	29	251	26	165	55	0.0273	416	0.2068
05-Sep	42	293	39	204	81	0.0403	497	0.2470
06-Sep	36	329	54	258	90	0.0447	587	0.2917
07-Sep	38	367	40	298	78	0.0388	665	0.3305

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Appendix C.8. (page 2 of 2)

Date	White Rock		Sheep Rock		Total			
	Count	Cum.	Count	Cum.	Count	Prop.	Cum.	Prop.
08-Sep	56	423	55	353	111	0.0552	776	0.3857
09-Sep	47	470	41	394	88	0.0437	864	0.4294
10-Sep	56	526	36	430	92	0.0457	956	0.4751
11-Sep	65	591	51	481	116	0.0577	1072	0.5328
12-Sep	34	625	51	532	85	0.0422	1157	0.5750
13-Sep	38	663	41	573	79	0.0393	1236	0.6143
14-Sep	34	697	41	614	75	0.0373	1311	0.6516
15-Sep	18	715	31	645	49	0.0244	1360	0.6759
16-Sep	15	730	28	673	43	0.0214	1403	0.6973
17-Sep	20	750	16	689	36	0.0179	1439	0.7152
18-Sep	7	757	16	705	23	0.0114	1462	0.7266
19-Sep	8	765	16	721	24	0.0119	1486	0.7386
20-Sep	5	770	29	750	34	0.0169	1520	0.7555
21-Sep	19	789	56	806	75	0.0373	1595	0.7927
22-Sep	17	806	40	846	57	0.0283	1652	0.8211
23-Sep	26	832	32	878	58	0.0288	1710	0.8499
24-Sep	12	844	24	902	36	0.0179	1746	0.8678
25-Sep	18	862	38	940	56	0.0278	1802	0.8956
26-Sep	21	883	17	957	38	0.0189	1840	0.9145
27-Sep	14	897	20	977	34	0.0169	1874	0.9314
28-Sep	25	922	7	984	32	0.0159	1906	0.9473
29-Sep	9	931	9	993	18	0.0089	1924	0.9563
30-Sep	10	941	6	999	16	0.0080	1940	0.9642
01-Oct	3	944	6	1005	9	0.0045	1949	0.9687
02-Oct	5	949	1	1006	6	0.0030	1955	0.9717
03-Oct	3	952	2	1008	5	0.0025	1960	0.9742
04-Oct	4	956	2	1010	6	0.0030	1966	0.9771
05-Oct	4	960	1	1011	5	0.0025	1971	0.9796
06-Oct	7	967	3	1014	10	0.0050	1981	0.9846
07-Oct	3	970	4	1018	7	0.0035	1988	0.9881
08-Oct	1	971	3	1021	4	0.0020	1992	0.9901
09-Oct	3	974	1	1022	4	0.0020	1996	0.9920
10-Oct	1	975	2	1024	3	0.0015	1999	0.9935
11-Oct	2	977	2	1026	4	0.0020	2003	0.9955
12-Oct ^a	4	981			4	0.0020	2007	0.9975
13-Oct	3	984			3	0.0015	2010	0.9990
14-Oct	2	986			2	0.0010	2012	1.0000
Total	986		1,026		2,012			

^a Sheep Rock fish wheel pulled on October 12.

Appendix D.1. Yukon River District 1 chinook salmon commercial catch composition by age, sex, and fishing period, 1993.

		Brood Year and Age Group ^a							
		1989	1988	1987		1986		1985	
		1.2	1.3	1.4	2.3	1.5	2.4	2.5	Total
Stratum Dates: 6/14-6/15		Period 1 ^b							
Sampling Dates: 6/15									
Sample Size: 293									
Female	Percent of Sample	0.7	12.6	41.3	0.3	4.8	0.0	0.0	59.7
	Number in Catch	62	1,152	3,769	31	436	0	0	5,451
Male	Percent of Sample	5.8	14.7	15.4	0.0	3.8	0.7	0.0	40.3
	Number in Catch	529	1,339	1,402	0	343	62	0	3,675
Total	Percent of Sample	6.5	27.3	56.7	0.3	8.5	0.7	0.0	100.0
	Number in Catch	592	2,492	5,170	31	779	62	0	9,126
	Standard Error	132	238	265	31	149	44	0	
Stratum Dates: 6/17-18		Period 2 ^b							
Sampling Dates: 6/18									
Sample Size: 342									
Female	Percent of Sample	0.3	5.6	31.3	0.3	6.4	0.6	0.0	44.4
	Number in Catch	67	1,279	7,202	67	1,481	135	0	10,231
Male	Percent of Sample	2.3	15.2	34.2	0.3	2.6	0.9	0.0	55.6
	Number in Catch	538	3,500	7,875	67	606	202	0	12,789
Total	Percent of Sample	2.6	20.8	65.5	0.6	9.1	1.5	0.0	100.0
	Number in Catch	606	4,779	15,077	135	2,087	337	0	23,020
	Standard Error	200	506	593	95	358	150	0	
Stratum Dates: 6/21		Period 3 ^b							
Sampling Dates: 6/22									
Sample Size: 322									
Female	Percent of Sample	0.0	6.2	37.9	0.0	5.3	0.6	0.0	50.0
	Number in Catch	0	648	3,950	0	550	65	0	5,213
Male	Percent of Sample	3.4	10.9	32.3	0.3	2.8	0.3	0.0	50.0
	Number in Catch	356	1,133	3,367	32	291	32	0	5,213
Total	Percent of Sample	3.4	17.1	70.2	0.3	8.1	0.9	0.0	100.0
	Number in Catch	356	1,781	7,318	32	842	97	0	10,426
	Standard Error	106	219	266	32	159	56	0	

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		Brood Year and Age Group ^a							Total
		1989	1988	1987		1986		1985	
		1.2	1.3	1.4	2.3	1.5	2.4	2.5	
Stratum Dates: 6/24		Period 4 ^c							
Sampling Dates: 6/25									
Sample Size: 195									
Female	Percent of Sample	4.1	7.7	22.6	0.0	3.1	0.0	0.0	37.4
	Number in Catch	90	169	497	0	68	0	0	824
Male	Percent of Sample	23.6	17.4	19.0	0.0	2.6	0.0	0.0	62.6
	Number in Catch	519	384	418	0	56	0	0	1,378
Total	Percent of Sample	27.7	25.1	41.5	0.0	5.6	0.0	0.0	100.0
	Number in Catch	610	553	915	0	124	0	0	2,202
	Standard Error	71	69	78	0	36	0	0	
Stratum Dates: 6/28		Period 5 ^b							
Sampling Dates: 6/29									
Sample Size: 370									
Female	Percent of Sample	0.0	7.3	41.1	0.0	3.2	0.0	0.0	51.6
	Number in Catch	0	213	1,201	0	95	0	0	1,509
Male	Percent of Sample	9.7	10.0	26.2	0.0	2.2	0.0	0.3	48.4
	Number in Catch	284	292	766	0	63	0	8	1,414
Total	Percent of Sample	9.7	17.3	67.3	0.0	5.4	0.0	0.3	100.0
	Number in Catch	284	506	1,967	0	158	0	8	2,923
	Standard Error	45	58	71	0	34	0	8	
Stratum Dates: 7/1		Period 6 ^b							
Sampling Dates: 7/2									
Sample Size: 346									
Female	Percent of Sample	0.9	9.5	33.8	0.0	4.6	0.0	0.0	48.8
	Number in Catch	14	152	537	0	73	0	0	776
Male	Percent of Sample	16.8	15.9	17.6	0.0	0.6	0.3	0.0	51.2
	Number in Catch	266	253	280	0	9	5	0	813
Total	Percent of Sample	17.6	25.4	51.4	0.0	5.2	0.3	0.0	100.0
	Number in Catch	280	404	817	0	83	5	0	1,589
	Standard Error	33	37	43	0	19	5	0	

^a Total catch for each period is from Appendix A.1. Catches allocated to age and sex categories are calculated from total catch. Discrepancies in row and column addition by category are due to rounding error and may be ignored.

^b No mesh size restriction; most fish taken with 8.5 in (21.6 cm) mesh gillnet.

^c Mesh size restricted to 6 in (15.2 cm) maximum.

Appendix D.2. Yukon River District 1 chinook salmon commercial catch composition by age, sex, and gillnet mesh size, 1993.

		Brood Year and Age Group ^a							
		1989	1988	1987		1986		1985	
		1.2	1.3	1.4	2.3	1.5	2.4	2.5	Total
Stratum Dates: 6/14–7/1		Periods 1–3 & 5–6 Unrestricted Mesh Gillnet							
Sampling Dates: 6/15, 6/18, 6/22, 6/29, 7/2									
Sample Size: 1,673									
Female	Percent of Sample	0.3	7.3	35.4	0.2	5.6	0.4	0.0	49.2
	Number in Catch	143	3,444	16,659	98	2,636	199	0	23,180
Male	Percent of Sample	4.2	13.8	29.1	0.2	2.8	0.6	0.0	50.8
	Number in Catch	1,975	6,518	13,691	100	1,312	301	8	23,904
Total	Percent of Sample	4.5	21.2	64.5	0.4	8.4	1.1	0.0	100.0
	Number in Catch	2,118	9,961	30,350	198	3,948	501	8	47,084
	Standard Error	239	470	551	75	319	118	15	
Stratum Dates: 6/24		Period 4 Restricted Mesh Gillnet							
Sampling Dates: 6/25									
Sample Size: 195									
Female	Percent of Sample	4.1	7.7	22.6	0.0	3.1	0.0	0.0	37.4
	Number in Catch	90	169	497	0	68	0	0	824
Male	Percent of Sample	23.6	17.4	19.0	0.0	2.6	0.0	0.0	62.6
	Number in Catch	519	384	418	0	56	0	0	1,378
Total	Percent of Sample	27.7	25.1	41.5	0.0	5.6	0.0	0.0	100.0
	Number in Catch	610	553	915	0	124	0	0	2,202
	Standard Error	71	69	78	0	36	0	0	
Stratum Dates: 6/14–7/1		Season Total							
Sampling Dates: 6/15–7/2									
Sample Size: 1,868									
Female	Percent of Sample	0.5	7.3	34.8	0.2	5.5	0.4	0.0	48.7
	Number in Catch	233	3,613	17,156	98	2,704	199	0	24,004
Male	Percent of Sample	5.1	14.0	28.6	0.2	2.8	0.6	0.0	51.3
	Number in Catch	2,494	6,902	14,109	100	1,368	301	8	25,282
Total ^b	Percent of Sample	5.5	21.3	63.4	0.4	8.3	1.0	0.0	100.0
	Number in Catch	2,728	10,514	31,265	198	4,072	501	8	49,286
	Standard Error	261	467	549	72	314	114	15	

^a Discrepancies in row and column addition by category are due to rounding error and may be ignored.

^b Total catch is from Appendix A.1. and does not include ADF&G test fish sales of 1,408 chinook salmon.

Appendix D.3. Yukon River District 1 chinook salmon subsistence catch by age and sex, 1993.

		Brood Year and Age Group ^a							Total		
		1989		1988		1987		1986		1985	
		1.2	1.3	1.4	2.3	1.5	2.4	2.5			
Stratum Dates:											
Sampling Dates:		6/15									
Sample Size:		293									
Female	Percent of Sample	0.7	12.6	41.3	0.3	4.8	0.0	0.0	59.7		
	Number in Catch	71	1,316	4,304	36	498	0	0	6,225		
Male	Percent of Sample	5.8	14.7	15.4	0.0	3.8	0.7	0.0	40.3		
	Number in Catch	605	1,530	1,601	0	391	71	0	4,198		
Total ^b	Percent of Sample	6.5	27.3	56.7	0.3	8.5	0.7	0.0	100.0		
	Number in Catch	676	2,846	5,905	36	889	71	0	10,423		
	Standard Error	150	272	302	36	170	50	0			

^a Age and sex composition is based on Yukon River District 1 period 1 commercial catch samples. Discrepancies in row and column addition are due to rounding error and may be ignored.

^b Total catch is from Appendix B.1 and includes 1,584 chinook salmon from ADF&G test fish catches.

Appendix D.4. Yukon River District 2 chinook salmon commercial catch composition by age, sex, and fishing period, 1993.

		Brood Year and Age Group ^{a, b}								
		1990	1989	1988	1987		1986		1985	
		1.1	1.2	1.3	1.4	2.3	1.5	2.4	2.5	Total
Stratum Dates: 6/16–17		Period 1								
Sampling Dates: 6/17										
Sample Size: 209										
Female	Percent of Sample	0.0	0.5	11.5	28.2	0.0	4.8	1.4	0.0	46.4
	Number in Catch	0	51	1,214	2,984	0	506	152	0	4,906
Male	Percent of Sample	0.0	6.2	20.6	20.6	0.5	4.8	1.0	0.0	53.6
	Number in Catch	0	657	2,175	2,175	51	506	101	0	5,664
Total	Percent of Sample	0.0	6.7	32.1	48.8	0.5	9.6	2.4	0.0	100.0
	Number in Catch	0	708	3,388	5,159	51	1,011	253	0	10,570
	Standard Error	0	183	342	366	51	216	112	0	
Stratum Dates: 6/20–6/21		Period 2								
Sampling Dates: 6/21										
Sample Size: 322										
Female	Percent of Sample	0.0	0.0	4.0	32.6	0.3	1.6	0.3	0.0	38.8
	Number in Catch	0	0	569	4,599	44	219	44	0	5,476
Male	Percent of Sample	0.0	4.3	16.1	37.6	0.0	3.1	0.0	0.0	61.2
	Number in Catch	0	613	2,278	5,300	0	438	0	0	8,629
Total	Percent of Sample	0.0	4.3	20.2	70.2	0.3	4.7	0.3	0.0	100.0
	Number in Catch	0	613	2,847	9,900	44	657	44	0	14,105
	Standard Error	0	161	316	360	44	166	44	0	
Stratum Dates: 6/25		Period 3								
Sampling Dates: 6/25										
Sample Size: 289										
Female	Percent of Sample	0.0	0.0	7.3	41.5	0.0	5.9	0.0	0.0	54.7
	Number in Catch	0	0	497	2,839	0	402	0	0	3,738
Male	Percent of Sample	0.3	3.1	11.4	24.2	0.3	5.5	0.3	0.0	45.3
	Number in Catch	24	213	781	1,656	24	379	24	0	3,100
Total	Percent of Sample	0.3	3.1	18.7	65.7	0.3	11.4	0.3	0.0	100.0
	Number in Catch	24	213	1,278	4,496	24	781	24	0	6,838
	Standard Error	24	70	157	191	24	128	24	0	

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		Brood Year and Age Group ^{a, b}								
		1990	1989	1988	1987		1986		1985	
		1.1	1.2	1.3	1.4	2.3	1.5	2.4	2.5	Total
Stratum Dates: 6/27		Period 4								
Sampling Dates: 6/27										
Sample Size: 189										
Female	Percent of Sample	0.0	0.0	5.8	38.1	0.5	5.3	1.1	0.0	50.8
	Number in Catch	0	0	184	1,204	17	167	33	0	1,606
Male	Percent of Sample	0.0	4.2	11.1	29.1	0.0	4.8	0.0	0.0	49.2
	Number in Catch	0	134	351	920	0	151	0	0	1,555
Total	Percent of Sample	0.0	4.2	16.9	67.2	0.5	10.1	1.1	0.0	100.0
	Number in Catch	0	134	535	2,124	17	318	33	0	3,161
	Standard Error	0	46	86	108	17	69	24	0	
Stratum Dates: 6/30		Period 5								
Sampling Dates: 6/30										
Sample Size: 201										
Female	Percent of Sample	0.0	1.5	7.5	36.8	0.0	4.5	0.0	0.5	50.7
	Number in Catch	0	39	195	964	0	117	0	13	1,329
Male	Percent of Sample	0.0	10.0	10.9	22.9	0.0	1.0	4.5	0.0	49.3
	Number in Catch	0	261	287	599	0	26	117	0	1,290
Total	Percent of Sample	0.0	11.4	18.4	59.7	0.0	5.5	4.5	0.5	100.0
	Number in Catch	0	300	482	1,564	0	143	117	13	2,619
	Standard Error	0	59	72	91	0	42	38	13	

^a Total catch for each period is from Appendix A.2. Catches allocated to age and sex categories are calculated from total catch. Discrepancies in row and column addition by category are due to rounding error and may be ignored.

^b No mesh size restriction; most fish taken with 8.5 in (21.6 cm) mesh gillnet.

Appendix D.5. Yukon River District 2 chinook salmon commercial catch composition by age and sex, 1993.

		Brood Year and Age Group ^a								
		1990	1989	1988	1987		1986		1985	
		1.1	1.2	1.3	1.4	2.3	1.5	2.4	2.5	Total
Stratum Dates: 6/16–6/30		Periods 1–5 Unrestricted Mesh Gillnet								
Sampling Dates: 6/17, 6/21, 6/26, 6/28, 7/1										
Sample Size: 1,210										
Female	Percent of Sample	0.0	0.2	7.1	33.8	0.2	3.8	0.6	0.0	45.7
	Number in Catch	0	90	2,660	12,591	61	1,412	229	13	17,054
Male	Percent of Sample	0.1	5.0	15.7	28.6	0.2	4.0	0.6	0.0	54.3
	Number in Catch	24	1,878	5,871	10,651	74	1,499	242	0	20,239
Total ^b	Percent of Sample	0.1	5.3	22.9	62.3	0.4	7.8	1.3	0.0	100.0
	Number in Catch	24	1,968	8,531	23,242	135	2,910	471	13	37,293
	Standard Error	27	240	451	520	64	288	120	20	

^a Discrepancies in row and column addition by category are due to rounding error and may be ignored.

^b Total catch is from Appendix A.2 and does not include ADF&G test fish sales of 164 chinook salmon.

Appendix D.6. Yukon River District 2 chinook salmon subsistence catch composition by age and sex, 1993.

		Brood Year and Age Group ^a								
		1990	1989	1988	1987		1986		1985	
		1.1	1.2	1.3	1.4	2.3	1.5	2.4	2.5	Total
Stratum Dates:										
Sampling Dates: 6/17										
Sample Size:		209								
Female	Percent of Sample	0.0	0.5	11.5	28.2	0.0	4.8	1.4	0.0	46.4
	Number in Catch	0	55	1,322	3,251	0	551	165	0	5,345
Male	Percent of Sample	0.0	6.2	20.6	20.6	0.5	4.8	1.0	0.0	53.6
	Number in Catch	0	716	2,369	2,369	55	551	110	0	6,171
Total ^b	Percent of Sample	0.0	6.7	32.1	48.8	0.5	9.6	2.4	0.0	100.0
	Number in Catch	0	771	3,692	5,620	55	1,102	276	0	11,516
	Standard Error	0	200	373	399	55	235	122	0	

^a Age and sex composition is based on Yukon River District 2 period 1 commercial catch samples. Discrepancies in row and column addition are due to rounding error and may be ignored.

^b Total catch is from Appendix B.1 and includes 471 chinook salmon from ADF&G test fish catches.

Appendix D.7. Yukon River District 3 chinook salmon commercial catch composition by age and sex, 1993.

		Brood Year and Age Group ^a								
		1990	1989	1988	1987		1986		1985	
		1.1	1.2	1.3	1.4	2.3	1.5	2.4	2.5	Total
Stratum Dates:		6/20–6/30								
Sampling Dates:										
Sample Size:		1,210								
Female	Percent of Sample	0.0	0.2	7.1	33.8	0.2	3.8	0.6	0.0	45.7
	Number in Catch	0	4	107	507	2	57	9	1	686
Male	Percent of Sample	0.1	5.0	15.7	28.6	0.2	4.0	0.6	0.0	54.3
	Number in Catch	1	76	236	429	3	60	10	0	815
Total ^b	Percent of Sample	0.1	5.3	22.9	62.3	0.4	7.8	1.3	0.0	100.0
	Number in Catch	1	79	343	935	5	117	19	1	1,501
	Standard Error	4	38	79	129	10	47	19	3	

^a Age and sex composition is based on District 2 total commercial catch. Discrepancies in row and column addition are due to rounding error and may be ignored.

^b Total catch is from Appendix A.3.

Appendix D.8. Yukon River District 3 chinook salmon subsistence catch composition by age and sex, 1993.

		Brood Year and Age Group ^a								
		1990	1989	1988	1987		1986		1985	
		1.1	1.2	1.3	1.4	2.3	1.5	2.4	2.5	Total
Stratum Dates:										
Sampling Dates: 6/17										
Sample Size:		209								
Female	Percent of Sample	0.0	0.5	11.5	28.2	0.0	4.8	1.4	0.0	46.4
	Number in Catch	0	31	743	1,828	0	310	93	0	3,005
Male	Percent of Sample	0.0	6.2	20.6	20.6	0.5	4.8	1.0	0.0	53.6
	Number in Catch	0	403	1,332	1,332	31	310	62	0	3,469
Total ^b	Percent of Sample	0.0	6.7	32.1	48.8	0.5	9.6	2.4	0.0	100.0
	Number in Catch	0	434	2,075	3,160	31	620	155	0	6,474
	Standard Error	0	112	209	224	31	132	69	0	

^a Age and sex composition is based on Yukon River District 2 period 1 commercial catch samples. Discrepancies in row and column addition are due to rounding error and may be ignored.

^b Total catch is from Appendix B.1.

Appendix D.9. Yukon River District 4 chinook salmon commercial and subsistence catch composition by age, sex, and gear type, 1993.

		Brood Year and Age Group ^a							
		1990	1989	1988		1987		1986	
		1.1	1.2	1.3	2.2	1.4	2.3	1.5	Total
Stratum Dates: 6/27-7/15		Fish Wheel							
Sampling Dates: 6/27-7/15									
Sample Size: 272									
Female	Percent of Sample	0.0	2.6	2.2	0.0	5.1	0.4	0.4	10.7
	Number in Catch	0	279	239	0	557	40	40	1,155
Male	Percent of Sample	1.8	53.3	26.5	0.7	6.6	0.4	0.0	89.3
	Number in Catch	199	5,773	2,867	80	717	40	0	9,675
Total	Percent of Sample	1.8	55.9	28.7	0.7	11.8	0.7	0.4	100.0
	Number in Catch	199	6,052	3,106	80	1,274	80	40	10,830
	Standard Error	88	327	298	56	212	56	40	
Stratum Dates: 7/1-7/5		Gillnet							
Sampling Dates: 7/1-7/5									
Sample Size: 92									
Female	Percent of Sample	0.0	0.0	2.2	0.0	34.8	1.1	5.4	43.5
	Number in Catch	0	0	61	0	970	30	152	1,213
Male	Percent of Sample	0.0	0.0	17.4	0.0	38.0	0.0	1.1	56.5
	Number in Catch	0	0	485	0	1,061	0	30	1,577
Total	Percent of Sample	0.0	0.0	19.6	0.0	72.8	1.1	6.5	100.0
	Number in Catch	0	0	546	0	2,031	30	182	2,789
	Standard Error	0	0	116	0	130	30	72	

^a Samples are from commercial catch only. Discrepancies in row and column addition by category are due to rounding error and may be ignored.

Appendix D.10. Yukon River District 5 chinook salmon commercial and subsistence catch composition by age, sex, and gear type, 1993.

		Brood Year and Age Group *							
		1989	1988	1987		1986		1985	
		1.2	1.3	1.4	2.3	1.5	2.4	2.5	Total
Stratum Dates: 7/7-7/8		Fish Wheel							
Sampling Dates: 7/7-7/8									
Sample Size: 58									
Female	Percent of Sample	1.7	3.4	5.2	0.0	1.7	1.7	0.0	13.8
	Number in Catch	324	648	971	0	324	324	0	2,590
Male	Percent of Sample	50.0	27.6	6.9	0.0	1.7	0.0	0.0	86.2
	Number in Catch	9,389	5,180	1,295	0	324	0	0	16,188
Total	Percent of Sample	51.7	31.0	12.1	0.0	3.4	1.7	0.0	100.0
	Number in Catch	9,713	5,828	2,266	0	648	324	0	18,779
	Standard Error	1,243	1,151	810	0	454	324	0	
Stratum Dates: 7/3-7/8		Gillnet							
Sampling Dates: 7/3-7/8									
Sample Size: 249									
Female	Percent of Sample	0.4	8.4	33.3	0.4	2.4	0.4	0.4	45.8
	Number in Catch	25	535	2,113	25	153	25	25	2,903
Male	Percent of Sample	5.6	21.7	24.1	0.4	2.4	0.0	0.0	54.2
	Number in Catch	356	1,375	1,528	25	153	0	0	3,438
Total	Percent of Sample	6.0	30.1	57.4	0.8	4.8	0.4	0.4	100.0
	Number in Catch	382	1,910	3,641	51	306	25	25	6,340
	Standard Error	96	185	199	36	86	25	25	

* Samples are from commercial catch only. Discrepancies in row and column addition by category are due to rounding error and may be ignored.

Appendix D.11. Yukon River District 6 chinook salmon commercial and subsistence fish wheel catch composition by age and sex, 1993.

		Brood Year and Age Group ^a					
		1990	1989	1988	1987	1986	
		1.1	1.2	1.3	1.4	1.5	Total
Stratum Dates: 7/13–7/20		Commercial					
Sampling Dates: 7/13, 7/20							
Sample Size: 110							
Female	Percent of Sample	0.0	0.0	5.5	10.9	0.9	17.3
	Number in Catch	0	0	78	155	13	245
Male	Percent of Sample	1.8	43.6	26.4	10.9	0.0	82.7
	Number in Catch	26	620	375	155	0	1,176
Total	Percent of Sample	1.8	43.6	31.8	21.8	0.9	100.0
	Number in Catch	26	620	452	310	13	1,421
	Standard Error	18	68	63	56	13	
Stratum Dates: 7/10–8/3		Subsistence					
Sampling Dates: 7/10–8/3							
Sample Size: ^b 175							
Female	Percent of Sample	0.0	0.6	6.9	8.6	0.0	16.0
	Number in Catch	0	18	211	264	0	493
Male	Percent of Sample	2.9	60.0	15.4	5.7	0.0	84.0
	Number in Catch	88	1,849	476	176	0	2,589
Total	Percent of Sample	2.9	60.6	22.3	14.3	0.0	100.0
	Number in Catch	88	1,867	687	440	0	3,082
	Standard Error	39	114	97	82	0	
Stratum Dates: 7/10–8/3		Total					
Sampling Dates: 7/10–8/3							
Sample Size: 285							
Female	Percent of Sample	0.0	0.4	6.4	9.3	0.3	16.4
	Number in Catch	0	18	289	419	13	739
Male	Percent of Sample	2.5	54.8	18.9	7.4	0.0	83.6
	Number in Catch	114	2,469	850	331	0	3,764
Total ^c	Percent of Sample	2.5	55.2	25.3	16.7	0.3	100.0
	Number in Catch	114	2,487	1,139	750	13	4,503
	Standard Error	42	133	116	100	14	

^a Discrepancies in row and column addition are due to rounding error and may be ignored.

^b Fifty-three samples were included from the ADF&G test fish wheel.

^c Gillnet catch (76) was not apportioned due to insufficient samples.

Appendix D.12. Canadian Yukon River chinook salmon test fish wheel catch composition by age, 1993.

		Brood Year and Age Group											
		1990		1989		1988			1987		1986		
		0.2	1.1	0.3	1.2	0.4	1.3	2.2	1.4	2.3	1.5	2.4	Total
Stratum Dates: 6/23–9/4		Sheep Rock											
Sampling Dates: 6/23–9/4													
Sample Size: 421													
	Sample Size	2	1	0	98	6	152	0	139	1	22	0	421
	Percent of Sample	0.5	0.2	0.0	23.3	1.4	36.1	0.0	33.0	0.2	5.2	0.0	100.0
	Standard Error	0.3	0.2	0.0	2.1	0.6	2.3	0.0	2.3	0.2	1.1	0.0	
Stratum Dates: 6/24–9/1		White Rock											
Sampling Dates: 6/24–9/1													
Sample Size: 545													
	Sample Size	2	3	1	208	3	182	1	128	0	15	2	545
	Percent of Sample	0.4	0.6	0.2	38.2	0.6	33.4	0.2	23.5	0.0	2.8	0.4	100.0
	Standard Error	0.3	0.3	0.2	2.1	0.3	2.0	0.2	1.8	0.0	0.7	0.3	
Stratum Dates: 6/23–9/4		Combined Test Wheels											
Sampling Dates: 6/23–9/4													
Sample Size: 966													
	Sample Size	4	4	1	306	9	334	1	267	1	37	2	966
	Percent of Sample	0.4	0.4	0.1	31.7	0.9	34.6	0.1	27.6	0.1	3.8	0.2	100.0
	Standard Error	0.2	0.2	0.1	1.5	0.3	1.5	0.1	1.4	0.1	0.6	0.1	

Appendix D.13. Length (mm measured from mid-orbit to fork-of-tail) by age and sex of Yukon River chinook salmon test fishing catch samples, 1993.

Location	Sex		Brood Year and Age Group							
			1990	1989	1988	1987		1986		1985
			1.1	1.2	1.3	1.4	2.3	1.5	2.4	2.5
Big Eddy 8.25 in (21.0 cm) Drift Gillnet	Female	Mean Length			748	844		930		
		Standard Error			22.5	21.6		10.4		
		Sample Size			2	8		3		
	Male	Mean Length			741	834				
		Standard Error			12.0	14.6				
		Sample Size			4	11				
Big Eddy 8.5 in (21.6 cm) Set Gillnet	Female	Mean Length			804	879		939	820	
		Standard Error			9.4	4.4		15.6	0.0	
		Sample Size			32	107		12	1	
	Male	Mean Length		552	781	885	770	929	850	
		Standard Error		36.1	10.5	6.2	0.0	20.8	55.0	
		Sample Size		3	49	74	1	6	2	
Big Eddy 5.5 in (14.0 cm) Set Gillnet	Female	Mean Length		605	697	825		1030		
		Standard Error		22.6	11.9	19.4		25.0		
		Sample Size		13	17	11		2		
	Male	Mean Length		567	669	821		915		
		Standard Error		4.0	8.4	41.1		5.0		
		Sample Size		68	46	10		2		
Middle Mouth 8.5 in (21.6 cm) Set Gillnet	Female	Mean Length			749	859		921		
		Standard Error			15.0	5.1		20.7		
		Sample Size			15	59		11		
	Male	Mean Length		650	767	845		956	940	
		Standard Error		0.0	10.4	8.0		10.6	0.0	
		Sample Size		1	25	57		11	1	
Middle Mouth 5.5 in (14.0 cm) Set Gillnet	Female	Mean Length		630	724	841		980		
		Standard Error		0.0	13.8	20.6		0.0		
		Sample Size		1	18	16		1		
	Male	Mean Length		564	680	814	760	955		
		Standard Error		2.9	9.3	23.4	0.0	35.0		
		Sample Size		93	53	13	1	2		
Manley Fish Wheel	Female	Mean Length			780					
		Standard Error			10.0					
		Sample Size			2					
	Male	Mean Length	460	540	745	820				
		Standard Error	10	6.6	27.5	0.0				
		Sample Size	2	44	4	1				

Appendix E.1. Yukon River District 1 summer chum salmon commercial catch composition by age, sex, and fishing period, 1993.

		Brood Year and Age Group ^a				
		1990	1989	1988	1987	Total
		0.2	0.3	0.4	0.5	
Stratum Dates: 6/14–6/15		Period 1 ^b				
Sampling Dates: 6/15						
Sample Size: 188						
Female	Percent of Sample	0.0	14.9	26.6	4.3	45.7
	Number in Catch	0	333	594	95	1,022
Male	Percent of Sample	0.0	13.3	31.4	9.6	54.3
	Number in Catch	0	297	701	214	1,213
Total	Percent of Sample	0.0	28.2	58.0	13.8	100.0
	Number in Catch	0	630	1,296	309	2,235
	Standard Error	0	74	81	56	
Stratum Dates: 6/17–6/18		Period 2 ^b				
Sampling Dates: 6/18						
Sample Size: 179						
Female	Percent of Sample	0.0	15.1	26.8	3.9	45.8
	Number in Catch	0	1,443	2,566	374	4,383
Male	Percent of Sample	0.0	17.3	28.5	8.4	54.2
	Number in Catch	0	1,657	2,726	802	5,185
Total	Percent of Sample	0.0	32.4	55.3	12.3	100.0
	Number in Catch	0	3,100	5,292	1,176	9,568
	Standard Error	0	336	357	235	
Stratum Dates: 6/21		Period 3 ^b				
Sampling Dates: 6/22						
Sample Size: 161						
Female	Percent of Sample	0.0	17.4	30.4	0.6	48.4
	Number in Catch	0	909	1,590	32	2,531
Male	Percent of Sample	0.0	19.9	28.6	3.1	51.6
	Number in Catch	0	1,038	1,493	162	2,693
Total	Percent of Sample	0.0	37.3	59.0	3.7	100.0
	Number in Catch	0	1,947	3,082	195	5,224
	Standard Error	0	200	203	78	

– Continued –

		Brood Year and Age Group ^a				
		1990	1989	1988	1987	Total
		0.2	0.3	0.4	0.5	
Stratum Dates:	6/24	Period 4 ^c				
Sampling Dates:	6/25					
Sample Size:	182					
Female	Percent of Sample	0.5	22.0	28.0	2.2	52.7
	Number in Catch	250	10,001	12,751	1,000	24,002
Male	Percent of Sample	0.0	22.5	23.6	1.1	47.3
	Number in Catch	0	10,251	10,751	500	21,501
Total	Percent of Sample	0.5	44.5	51.6	3.3	100.0
	Number in Catch	250	20,251	23,502	1,500	45,503
	Standard Error	250	1,681	1,690	604	
Stratum Dates:	6/28	Period 5 ^b				
Sampling Dates:	6/29					
Sample Size:	165					
Female	Percent of Sample	0.6	21.8	26.7	3.6	52.7
	Number in Catch	19	687	840	115	1,661
Male	Percent of Sample	0.0	21.8	21.8	3.6	47.3
	Number in Catch	0	687	687	115	1,490
Total	Percent of Sample	0.6	43.6	48.5	7.3	100.0
	Number in Catch	19	1,375	1,528	229	3,151
	Standard Error	19	122	123	64	
Stratum Dates:	7/1	Period 6 ^b				
Sampling Dates:	7/2					
Sample Size:	193					
Female	Percent of Sample	0.0	19.2	31.1	1.6	51.8
	Number in Catch	0	1,529	2,480	124	4,134
Male	Percent of Sample	0.0	23.3	23.8	1.0	48.2
	Number in Catch	0	1,860	1,901	83	3,844
Total	Percent of Sample	0.0	42.5	54.9	2.6	100.0
	Number in Catch	0	3,390	4,382	207	7,978
	Standard Error	0	285	286	91	

^a Discrepancies in row and column addition by category are due to rounding error and may be ignored.

^b No mesh size restrictions; most fish taken with 8.5 in (21.6 cm) gillnet.

^c Mesh size restricted to 6 in (15.2 cm) or less.

Appendix E.2. Yukon River District 1 summer chum salmon commercial catch composition by age, sex, and gillnet mesh size, 1993.

		Brood Year and Age Group ^a				
		1990	1989	1988	1987	Total
		0.2	0.3	0.4	0.5	
Stratum Dates: 6/14–7/1		Periods 1–3 & 5–6 Unrestricted Mesh Gillnet				
Sampling Dates: 6/15, 6/18, 6/22, 6/29, 7/2						
Sample Size: 886						
Female	Percent of Sample	0.1	17.4	28.7	2.6	48.8
	Number in Catch	19	4,902	8,071	740	13,731
Male	Percent of Sample	0.0	19.7	26.7	4.9	51.2
	Number in Catch	0	5,540	7,509	1,375	14,425
Total	Percent of Sample	0.1	37.1	55.3	7.5	100.0
	Number in Catch	19	10,442	15,580	2,116	28,156
	Standard Error	25	457	471	249	
Stratum Dates: 6/24		Period 4 Restricted Mesh Gillnet				
Sampling Dates: 6/25						
Sample Size: 182						
Female	Percent of Sample	0.5	22.0	28.0	2.2	52.7
	Number in Catch	250	10,001	12,751	1,000	24,002
Male	Percent of Sample	0.0	22.5	23.6	1.1	47.3
	Number in Catch	0	10,251	10,751	500	21,501
Total	Percent of Sample	0.5	44.5	51.6	3.3	100.0
	Number in Catch	250	20,251	23,502	1,500	45,503
	Standard Error	250	1,681	1,690	604	
Stratum Dates: 6/14–7/1		Season Total				
Sampling Dates: 6/15–7/2						
Sample Size: 1,068						
Female	Percent of Sample	0.4	20.2	28.3	2.4	51.2
	Number in Catch	269	14,902	20,821	1,740	37,733
Male	Percent of Sample	0.0	21.4	24.8	2.5	48.8
	Number in Catch	0	15,791	18,260	1,875	35,926
Total ^b	Percent of Sample	0.4	41.7	53.1	4.9	100.0
	Number in Catch	269	30,693	39,081	3,616	73,659
	Standard Error	136	1,112	1,125	487	

^a Discrepancies in row and column addition by category are due to rounding error and may be ignored.

^b Total does not include ADF&G test fish sales of 1,379 chum salmon in District 1.

Appendix E.3. Yukon River District 1 summer chum salmon subsistence catch composition by age and sex, 1993.

		Brood Year and Age Group ^a				Total
		1990	1989	1988	1987	
		0.2	0.3	0.4	0.5	
Stratum Dates:	6/14-7/1					
Sampling Dates:						
Sample Size:	1,068					
Female	Percent of Sample	0.4	20.2	28.3	2.4	51.2
	Number in Catch	125	6,936	9,691	810	17,563
Male	Percent of Sample	0.0	21.4	24.8	2.5	48.8
	Number in Catch	0	7,350	8,499	873	16,722
Total ^b	Percent of Sample	0.4	41.7	53.1	4.9	100.0
	Number in Catch	125	14,286	18,191	1,683	34,285
	Standard Error	63	517	524	227	

^a Age and sex composition is based on District 1 commercial catch.

^b Total catch is from Appendix B.2 and includes 4,111 summer chum salmon from ADF&G test fish catches.

Appendix E.4. Yukon River District 2 summer chum salmon commercial catch composition by age and sex, 1993.

		Brood Year and Age Group ^a			Total
		1989	1988	1987	
		0.3	0.4	0.5	
Stratum Dates:	6/16–6/30	Periods 1–5 Unrestricted Mesh Gillnet			
Sampling Dates:	6/17, 6/26, 7/1				
Sample Size:	218				
Female	Percent of Sample	17.0	21.6	3.7	42.2
	Number in Catch	3,281	4,168	709	8,158
Male	Percent of Sample	25.2	29.4	3.2	57.8
	Number in Catch	4,877	5,675	621	11,174
Total ^b	Percent of Sample	42.2	50.9	6.9	100.0
	Number in Catch	8,158	9,843	1,330	19,332
	Standard Error	648	656	332	

^a Discrepancies in row and column addition are due to rounding error and may be ignored.

^b No samples were taken from periods 2 (6/20–6/21) and 4 (6/27). Total does not include ADF&G test fish sales of 490 summer chum salmon.

Appendix E.5. Yukon River District 2 summer chum salmon subsistence catch composition by age and sex, 1993.

		Brood Year and Age Group ^a				
		1990	1989	1988	1987	Total
		0.2	0.3	0.4	0.5	
Stratum Dates:	6/16–6/30					
Sampling Dates:						
Sample Size:	1,068					
Female	Percent of Sample	0.4	20.2	28.3	2.4	51.2
	Number in Catch	93	5,142	7,185	601	13,020
Male	Percent of Sample	0.0	21.4	24.8	2.5	48.8
	Number in Catch	0	5,449	6,301	647	12,397
Total ^b	Percent of Sample	0.4	41.7	53.1	4.9	100.0
	Number in Catch	93	10,591	13,485	1,248	25,417
	Standard Error	47	384	388	168	

^a Age and sex composition is based on District 1 commercial catch. Discrepancies in row and column addition are due to rounding error and may be ignored.

^b Total catch includes 2,098 summer chum salmon from ADF&G test fish catches.

Appendix E.6. Yukon River District 3 summer chum salmon commercial catch composition by age and sex, 1993.

		Brood Year and Age Group ^a			
		1989	1988	1987	Total
		0.3	0.4	0.5	
Stratum Dates:	6/20--6/30				
Sampling Dates:					
Sample Size:	218				
Female	Percent of Sample	17.0	21.6	3.7	42.2
	Number in Catch	79	100	17	195
Male	Percent of Sample	25.2	29.4	3.2	57.8
	Number in Catch	117	136	15	268
Total	Percent of Sample	42.2	50.9	6.9	100.0
	Number in Catch	195	236	32	463
	Standard Error	16	16	8	

^a Age and sex composition is based on District 2 commercial catch. Discrepancies in row and column addition are due to rounding error and may be ignored.

Appendix E.7. Yukon River District 3 summer chum salmon subsistence catch composition by age and sex, 1993.

		Brood Year and Age Group				
		1990	1989	1988	1987	
		0.2	0.3	0.4	0.5	Total
Stratum Dates:	6/20–6/30					
Sampling Dates:						
Sample Size:	1,068					
Female	Percent of Sample	0.4	20.2	28.3	2.4	51.2
	Number in Catch	12	683	954	80	1,729
Male	Percent of Sample	0.0	21.4	24.8	2.5	48.8
	Number in Catch	0	724	837	86	1,647
Total ^a	Percent of Sample	0.4	41.7	53.1	4.9	100.0
	Number in Catch	12	1,407	1,791	166	3,376
	Standard Error	6	51	52	22	

^a Age and sex composition is based on District 1 commercial catch. Discrepancies in row and column addition are due to rounding error and may be ignored.

Appendix E.8. Yukon River District 4 summer chum salmon commercial and subsistence fish wheel catch composition by age and sex, 1993.

		Brood Year and Age Group ^a				
		1990	1989	1988	1987	
		0.2	0.3	0.4	0.5	Total
Stratum Dates:	6/30–7/16					
Sampling Dates:	6/30–7/16					
Sample Size:	366					
Female	Percent of Sample	0.3	29.2	19.9	1.9	51.4
	Number in Catch	135	14,485	9,882	948	25,450
Male	Percent of Sample	0.0	29.2	18.0	1.4	48.6
	Number in Catch	0	14,485	8,935	677	24,096
Total ^b	Percent of Sample	0.3	58.5	38.0	3.3	100.0
	Number in Catch	135	28,969	18,817	1,624	49,546
	Standard Error	135	1,278	1,259	462	

^a Samples are from commercial catch only. Discrepancies in row and column addition are due to rounding error and may be ignored.

^b Gillnet catch (17,670) was not apportioned due to insufficient samples.

Appendix E.9. Yukon River District 5 summer chum salmon subsistence fish wheel catch composition by age and sex, 1993.

		Brood Year and Age Group ^a				Total
		1990	1989	1988	1987	
		0.2	0.3	0.4	0.5	
Stratum Dates: 6/28–7/15						
Sampling Dates:						
Sample Size: 366						
Female	Percent of Sample	0.3	29.2	19.9	1.9	51.4
	Number in Catch	21	2,212	1,509	145	3,887
Male	Percent of Sample	0.0	29.2	18.0	1.4	48.6
	Number in Catch	0	2,212	1,365	103	3,680
Total ^{b,c}	Percent of Sample	0.3	58.5	38.0	3.3	100.0
	Number in Catch	21	4,424	2,874	248	7,567
	Standard Error	21	195	192	71	

^a Discrepancies in row and column addition are due to rounding error and may be ignored.

^b Samples are from District 4 commercial fish wheel catch.

^c Gillnet catch (3,678) was not apportioned due to insufficient samples.

Appendix E.10. Yukon River District 6 summer chum salmon commercial and subsistence fish wheel catch composition by age and sex, 1993.

		Brood Year and Age Group ^a				
		1990	1989	1988	1987	Total
		0.2	0.3	0.4	0.5	
Stratum Dates: 7/13–7/20		Commercial				
Sampling Dates: 7/13, 7/17, 7/20						
Sample Size: 85						
Female	Percent of Sample	0.0	41.2	17.6	0.0	58.8
	Number in Catch	0	1,357	582	0	1,939
Male	Percent of Sample	0.0	27.1	14.1	0.0	41.2
	Number in Catch	0	892	465	0	1,357
Total	Percent of Sample	0.0	68.2	31.8	0.0	100.0
	Number in Catch	0	2,249	1,047	0	3,296
	Standard Error	0	167	167	0	
Stratum Dates: 7/17–8/3		Subsistence				
Sampling Dates: 7/17–8/3						
Sample Size: 274						
Female	Percent of Sample	2.6	53.3	10.2	0.4	66.4
	Number in Catch	170	3,542	679	24	4,415
Male	Percent of Sample	1.5	23.7	7.7	0.7	33.6
	Number in Catch	97	1,577	509	49	2,232
Total ^b	Percent of Sample	4.0	77.0	17.9	1.1	100.0
	Number in Catch	267	5,119	1,189	73	6,647
	Standard Error	79	169	154	42	
Stratum Dates: 7/17–8/3		Total				
Sampling Dates: 7/17–8/3						
Sample Size: 359						
Female	Percent of Sample	1.7	49.3	12.7	0.2	63.9
	Number in Catch	170	4,899	1,261	24	6,354
Male	Percent of Sample	1.0	24.8	9.8	0.5	36.1
	Number in Catch	97	2,469	975	49	3,589
Total ^c	Percent of Sample	2.7	74.1	22.5	0.7	100.0
	Number in Catch	267	7,368	2,236	73	9,943
	Standard Error	85	230	219	45	

^a Discrepancies in row and column addition by category are due to rounding error and may be ignored.

^b Age and sex composition includes ADF&G test fish wheel catch samples (42), and total includes 33 summer chum salmon from the test fish wheel catches (died in the live box).

^c Gillnet catch (1,234) was not apportioned due to insufficient samples.

Appendix E.11. Length (mm measured from mid-orbit to fork-of-tail) by age and sex of Yukon River summer chum salmon test fishing catch samples, 1993.

Location	Sex		Brood Year and Age Group			
			1990	1989	1988	1987
			0.2	0.3	0.4	0.5
Big Eddy 5.5 in (14.0 cm) Drift Gillnet	Female	Mean Length			559	560
		Standard Error			12.6	0.0
		Sample Size			4	1
	Male	Mean Length		630	577	618
		Standard Error		0.0	2.6	7.5
		Sample Size		1	5	2
Big Eddy 5.5 in (14.0 cm) Set Gillnet	Female	Mean Length	525	553	564	599
		Standard Error	0.0	1.8	1.5	11.5
		Sample Size	1	178	270	18
	Male	Mean Length		567	582	606
		Standard Error		2.1	1.8	8.2
		Sample Size		193	246	22
Middle Mouth 5.5 in (14.0 cm) Set Gillnet	Female	Mean Length		548	563	577
		Standard Error		3.8	1.8	5.4
		Sample Size		154	246	19
	Male	Mean Length		563	576	593
		Standard Error		2.0	1.9	6.3
		Sample Size		146	246	18
Pilot Station 5.5 in (14.0 cm) Drift Gillnet	Female	Mean Length		530	533	
		Standard Error		4.9	6.1	
		Sample Size		24	17	
	Male	Mean Length		552	550	
		Standard Error		5.2	8.2	
		Sample Size		11	10	
Pilot Station 5.0 in (12.7 cm) Drift Gillnet	Female	Mean Length	490	528	530	
		Standard Error	5.0	2.9	3.5	
		Sample Size	2	63	43	
	Male	Mean Length		541	562	
		Standard Error		5.4	9.1	
		Sample Size		17	15	
Manley Fish Wheel	Female	Mean Length	530	537	570	
		Standard Error	15.0	6.3	0.0	
		Sample Size	2	24	1	
	Male	Mean Length	540	596	620	585
		Standard Error	0.0	11.2	5.8	30.0
		Sample Size	1	9	3	2

Appendix F.1. Yukon River District 1 fall chum salmon subsistence catch composition by age and sex, 1993.

		Brood Year and Age Group ^a				Total
		1990	1989	1988	1987	
		0.2	0.3	0.4	0.5	
Stratum Dates:	7/16–8/24					
Sampling Dates:	7/16–8/24					
Sample Size:	1,616					
Female	Percent of Sample	0.1	41.3	21.7	1.1	64.2
	Number in Catch	10	3,212	1,683	82	4,986
Male	Percent of Sample	0.1	20.5	14.5	0.7	35.8
	Number in Catch	5	1,596	1,130	53	2,784
Total ^b	Percent of Sample	0.2	61.9	36.2	1.7	100.0
	Number in Catch	14	4,808	2,813	135	7,770
	Standard Error	8	94	93	25	

^a Age and sex composition is based on Big Eddy and Middle Mouth fall chum salmon test fishing catches combined. Discrepancies in row and column addition are due to rounding error and may be ignored.

^b Total catch is from Appendix B.3 and includes 3,692 fall chum salmon from ADF&G test fish catches.

Appendix F.2. Yukon River District 2 fall chum salmon subsistence catch composition by age and sex, 1993.

		Brood Year and Age Group ^a				
		1990	1989	1988	1987	
		0.2	0.3	0.4	0.5	Total
Stratum Dates:	7/16–8/24					
Sampling Dates:	7/16–8/24					
Sample Size:	1,616					
Female	Percent of Sample	0.1	41.3	21.7	1.1	64.2
	Number in Catch	4	1,279	670	33	1,985
Male	Percent of Sample	0.1	20.5	14.5	0.7	35.8
	Number in Catch	2	636	450	21	1,109
Total ^b	Percent of Sample	0.2	61.9	36.2	1.7	100.0
	Number in Catch	6	1,915	1,120	54	3,094
	Standard Error	3	37	37	10	

^a Age and sex composition is based on Big Eddy and Middle Mouth fall chum salmon test fishing catches combined. Discrepancies in row and column addition are due to rounding error and may be ignored.

^b Total catch includes 652 fall chum salmon from ADF&G test fish catches.

Appendix F.3. Yukon River District 3 fall chum salmon subsistence catch composition by age and sex, 1993.

		Brood Year and Age Group ^a				
		1990	1989	1988	1987	Total
		0.2	0.3	0.4	0.5	
Stratum Dates:	7/16–8/24					
Sampling Dates:	7/16–8/24					
Sample Size:	1,616					
Female	Percent of Sample	0.1	41.3	21.7	1.1	64.2
	Number in Catch	2	512	268	13	794
Male	Percent of Sample	0.1	20.5	14.5	0.7	35.8
	Number in Catch	1	254	180	8	444
Total	Percent of Sample	0.2	61.9	36.2	1.7	100.0
	Number in Catch	2	766	448	21	1,238
	Standard Error	1	15	15	4	

^a Age and sex composition is based on Big Eddy and Middle Mouth fall chum salmon test fishing catches combined. Discrepancies in row and column addition are due to rounding error and may be ignored.

Appendix F.4. Canadian Yukon River fall chum salmon commercial and subsistence fish wheel catch composition by age, 1993.

		Brood Year and Age Group ^{a, b}			Total
		1989	1988	1987	
		0.3	0.4	0.5	
Stratum Dates:	8/01 – 08/25				
Sampling Dates:	8/01 – 08/25				
Sample Size:		94			
	Percent of Sample	66.0	31.9	2.1	100.0
	Number in Catch	2,458	1,189	79	3,727
	Standard Error	183	180	56	

^a Age composition is based on Sheep Rock and White Rock test fish wheel samples.

^b Canada gillnet catch (10,363) was not apportioned due to insufficient samples.

Appendix F.5. Length (mm measured from mid-orbit to fork-of-tail) by age and sex of Yukon River fall chum salmon test fishing catch samples, 1993.

Location	Sex		Brood Year and Age Group			
			1990	1989	1988	1987
			0.2	0.3	0.4	0.5
Big Eddy 6 in (15.2 cm) Set Gillnet	Female	Mean Length		584	600	618
		Standard Error		1.6	2.0	7.2
		Sample Size		252	153	10
	Male	Mean Length		593	600	611
		Standard Error		2.6	3.2	14.6
		Sample Size		144	107	4
Middle Mouth 6 in (15.2 cm) Set Gillnet	Female	Mean Length	565	578	592	604
		Standard Error	10.0	1.2	2.0	13.1
		Sample Size	2	415	197	7
	Male	Mean Length	510	587	596	604
		Standard Error	0.0	2.1	2.7	12.5
		Sample Size	1	188	128	7

Appendix G.1. Yukon River District 1 coho salmon subsistence catch composition by age and sex, 1993.

		Brood Year and Age Group ^a			
		1990	1989	1988	
		1.1	2.1	3.1	Total
Stratum Dates:	7/27–8/24				
Sampling Dates:	7/27–8/24				
Sample Size:		522			
Female	Percent of Sample	7.7	39.3	0.8	47.7
	Number in Catch	180	920	18	1,118
Male	Percent of Sample	7.9	44.3	0.2	52.3
	Number in Catch	184	1,037	4	1,225
Total ^b	Percent of Sample	15.5	83.5	1.0	100.0
	Number in Catch	364	1,957	22	2,343
	Standard Error	37	38	10	

^a Age and sex composition is based on Big Eddy and Middle Mouth coho salmon test fishing catches combined.

^b Total catch is from Appendix B.4 and includes 1,210 coho salmon from ADF&G test fish catches.

Appendix G.2. Yukon River District 2 coho salmon subsistence catch composition by age and sex, 1993.

		Brood Year and Age Group ^a			
		1990	1989	1988	Total
		1.1	2.1	3.1	
Stratum Dates:	7/27-8/24				
Sampling Dates:	7/27-8/24				
Sample Size:	522				
Female	Percent of Sample	7.7	39.3	0.8	47.7
	Number in Catch	130	666	13	809
Male	Percent of Sample	7.9	44.3	0.2	52.3
	Number in Catch	133	750	3	886
Total ^b	Percent of Sample	15.5	83.5	1.0	100.0
	Number in Catch	263	1,416	16	1,695
	Standard Error	27	28	7	

^a Age and sex composition is based on Big Eddy and Middle Mouth coho salmon test fishing catches combined.

^b Total catch includes 222 coho salmon from ADF&G test fish catches.

Appendix G.3. Yukon River District 3 coho salmon subsistence catch composition by age and sex, 1993.

		Brood Year and Age Group ^a			
		1990	1989	1988	Total
		1.1	2.1	3.1	
Stratum Dates:	7/27–8/24				
Sampling Dates:	7/27–8/24				
Sample Size:		522			
Female	Percent of Sample	7.7	39.3	0.8	47.7
	Number in Catch	18	94	2	114
Male	Percent of Sample	7.9	44.3	0.2	52.3
	Number in Catch	19	106	0	126
Total	Percent of Sample	15.5	83.5	1.0	100.0
	Number in Catch	37	200	2	240
	Standard Error	4	4	1	

^a Age and sex composition is based on Big Eddy and Middle Mouth coho salmon test fishing catches combined. Discrepancies in row and column addition are due to rounding error and may be ignored.

Appendix G.4. Length (mm measured from mid-orbit to fork-of-tail) by age and sex of Yukon River coho salmon test fishing catch samples, 1993.

Location	Sex		Brood Year and Age Group		
			1990	1989	1988
			1.1	2.1	3.1
Big Eddy 6 in (15.2 cm) Set Gillnet	Female	Mean Length	568	568	
		Standard Error	6.4	3.9	
		Sample Size	14	43	
	Male	Mean Length	553	567	
		Standard Error	7.0	3.9	
		Sample Size	16	54	
Middle Mouth 6 in (15.2 cm) Set Gillnet	Female	Mean Length	569	568	579
		Standard Error	6.1	2.0	7.2
		Sample Size	26	162	4
	Male	Mean Length	568	568	560
		Standard Error	7.9	2.3	0.0
		Sample Size	25	177	1

