

## **TECHNICAL FISHERY REPORT 91-14**

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Alaska Department of Fish and Game  
Division of Commercial Fisheries  
P.O. Box 3-2000  
Juneau, Alaska 99802

September 1991

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### **Kodiak Management Area Salmon Catch and Escapement Statistics, 1987**

**by**

**Patrick B. Holmes**

The Technical Fishery Report Series was established in 1987, replacing the Technical Data Report Series. The scope of this new series has been broadened to include reports that may contain data analysis, although data oriented reports lacking substantial analysis will continue to be included. The new series maintains an emphasis on timely reporting of recently gathered information, and this may sometimes require use of data subject to minor future adjustments. Reports published in this series are generally interim, annual, or iterative rather than final reports summarizing a completed study or project. They are technically oriented and intended for use primarily by fishery professionals and technically oriented fishing industry representatives. Publications in this series have received several editorial reviews and at least one *blind* peer review refereed by the division's editor and have been determined to be consistent with the division's publication policies and standards.

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## ABSTRACT

In the Kodiak Management Area in 1987 a total of 489 salmon permit holders made 13,161 landings, for a commercial harvest of 7,747,012 fish, 39% lower than the 1977-86 average harvest of 12,748,358 fish. The species composition of the catch was 4,612 chinook (*Oncorhynchus tshawytscha*), 1,792,851 sockeye, 192,540 coho (*O. kisutch*), 5,075,027 pink (*O. gorbuscha*), and 681,982 chum (*O. keta*) salmon. The sockeye catch was 56% of the record 1986 harvest and 31% greater than the 1977-86 average. The pink catch was 29% less than the 1977-85 average odd-year harvest. The estimated escapement of 6,775,284 fish included 23,739 chinook, 1,679,701 sockeye, 239,669 coho, 3,949,598 pink, and 882,567 chum salmon. Over 90% of the area's run of 14,159,834 salmon originated from systems on the west and south side of Kodiak Island. Chinook salmon from the Red River escapement were primarily age 1.4 (63%) and had an average length of 735 mm and a 1.4:1 male to female ratio. Sockeye salmon in the catch were mainly 4 (14%) and 5 (73%) years of age and had an average length of 564 mm and a 1.2:1 male to female ratio. Sockeye salmon in the escapement were predominantly 5 (51%) and 6 (31%) years of age and had an average length of 532 mm and a 1.2:1 male to female ratio. Coho salmon catch samples were primarily ages 1.1 (44%) and 2.1 (46%) and had a mean length of 614 mm, and a 1.9:1 male to female ratio. Coho salmon in the escapement were primarily age 1.1 (19%) and 2.1 (60%) fish and had a mean length of 621 mm, and a male to female ratio of 1.7:1. Chum salmon in the sampled catch were primarily age 0.3 (57%) and had a mean length of 600 mm, and a 0.9:1 male to female ratio.

KEY WORDS: Kodiak, salmon, *Oncorhynchus*, catch, escapement, age, length, sex

## INTRODUCTION

The 1987 salmon catch and escapement data for the Kodiak Management Area summarized in this report will, when combined with other years, facilitate the future evaluation of salmon stocks, including the development of brood tables, refinement of escapement goals, and forecasting future runs.

The Kodiak Management Area encompasses the area on the southern Alaska Peninsula from Cape Douglas to the southern entrance of Imuya Bay near Kilokak Rocks, including the Kodiak Archipelago. The area is divided into 9 districts, 17 sections, and 98 statistical reporting areas (Figures 1, 2; ADF&G 1987a). According to Larry Malloy (Alaska Department of Fish and Game, Kodiak, personal communication) salmon escapements were monitored in 250 of the area's 386 salmon streams during 1987 (ADF&G 1987b).

Commercial salmon fishing with purse seines, beach seines, and set gill nets is permitted within the management area. The type of fishing gear is restricted, however, within some management sections (ADF&G 1987a; Appendix A). Five salmon species are harvested in the Kodiak Management Area. In order of commercial importance they are sockeye salmon (*Oncorhynchus nerka*), pink salmon (*O. gorbuscha*), chum salmon (*O. keta*), coho salmon (*O. kisutch*), and chinook salmon (*O. tshawytscha*). Details of the area salmon management program are presented in Malloy 1987.

Management of Kodiak's major fisheries is complicated by run timing overlap among species. Pink and chum salmon overlap with early sockeye runs beginning about July 6, and coho salmon overlap the late sockeye runs around mid-August. Chinook salmon are harvested incidently to early sockeye runs; there are no directed chinook fisheries in the management area. Karluk River and Red (Ayakulik) River are the only systems with large chinook runs.

Major sockeye fisheries occur in the Uganik Bay, Uyak Bay, Karluk, Red River, and Alitak Bay Districts. Karluk River, Red (Ayakulik) River, Frazer Lake, and Upper Station Lakes are the major contributing stocks in these fisheries (Figure 3). A major sockeye interception fishery occurs in the Cape Igvak Section of the Mainland District. Historical tagging data indicates 80% of the sockeye harvest from this fishery were of Chignik River origin sockeye (ADF&G 1987a; Lechner 1969). During a limited period in July, Cook Inlet-bound sockeye salmon were taken in the North and Southwest Afognak Sections; Barrett (Alaska Department of Fish and Game, Kodiak, personal communication, 1988) estimated that approximately 95% of the catch were of Cook Inlet origin. The interception occurred during a record sockeye return to the Cook Inlet. The small sockeye harvest during this same period in the Big River, Kukak, and Dakavak Sections focused on local stocks (L. Malloy, Alaska Department of Fish and Game, Kodiak, personal communication, 1988). Terminal and local interception fisheries also occur on stocks originating from Pauls, Thorshiem, Afognak, Barabara, Malina, Uganik, Saltery, Kafli Lakes, Swikshak River, and Ocean Beach Creek. No directed fisheries occur on fish from Little River, Akalura, Horse Marine, and Silver Salmon Lakes; they are harvested incidently in the major fisheries.

The largest coho harvests occur in the Afognak, Mainland, and General Districts. The largest coho escapements usually occur in the Karluk and Red (Ayakulik) Rivers.

Pink salmon fisheries occur throughout the management area. Much of the harvest is taken in cape fisheries (mixed local-stock migration corridors). The largest

catch usually occurs in the Uganik and Uyak Bay Districts. The largest escapements occur at Karluk and Red Rivers during even years; odd-year escapements are usually larger in Uganik, Uyak, Humpy, and Seven Rivers.

The largest chum harvests usually occur in the Uganik Bay and Uyak Bay Districts. Spiridon, Sturgeon, and Kizuyak Rivers often support the largest chum escapements. However, during 1987 exceptional runs to Big and Kukak Rivers in the Mainland District supported the largest chum catch and escapements in the management area.

## METHODS

### *Catch Enumeration*

The catch data presented in this report were compiled by the Division of Commercial Fisheries, Alaska Department of Fish and Game. Data were compiled by statistical week from individual fish ticket sales receipts for fish sold to the processors; a statistical week begins at 0000 hours each Sunday and ends at 2400 hours on Saturday; weeks are numbered sequentially from the first Sunday of the year. Statistical weeks for 1987 and the corresponding calendar dates are presented in Appendix B. These data were edited for misreported landings, incorrect gear types in exclusive gear areas, and late landings during closed periods (Holmes 1990). Data in this report may differ slightly from earlier publications because of more recent editing.

### *Estimating Stock Composition of the Catch*

Chinook, coho, pink, and chum catches were compiled by broad geographic areas based on traditional fishing patterns and distribution of tenders. A lack of tagging information for these species combined with a management program which encourages cape fisheries prevented assigning the catch of these species to their stream of origin.

### Sockeye Salmon

Catch composition of the major sockeye stocks was based on limited tagging data and unpublished management information on timing and distribution. Data from a 1981 tagging study (Tyler et al. 1986) were used to determine the composition of the Karluk River, Red River, Upper Station and Frazer Lake stocks in the fisheries on the west side of Afognak and Kodiak Islands. Data from a 1984 tagging study conducted by Ken Manthey and analyzed by Barrett (1988) were used to calculate the composition of the Upper Station and Frazer Lakes stocks in the Moser-Olga Bay Section of the Alitak Bay District. Catches of Pauls, Afognak, Uganik, Saltery, Buskin, Swikshak and Kafliia Lakes stocks were assigned to terminal harvest areas (K. Manthey, D. Prokopowich, and L. Malloy, Alaska Department of Fish and Game, Kodiak, personal communication).

The objective of estimating sockeye stock composition of the commercial catch is to allow the post-season construction of brood tables which are used for forecasting future returns. This method of catch assignment was not designed to address catch allocation issues. Some fishermen have previously expressed an interest in using the tagging information to address harvest allocation concerns between commercial fishing user groups. Tyler et al. (1986), described the inherent biases associated with the 1981 tagging study which prevent using the data in that manner. Current sockeye management policies are outlined in Prokopowich, Brennan, and Gretch (1991).

Tag recoveries at the stream of origin were used to determine the major stock's early run composition in each fishery (Tyler et al. 1984, Barrett 1988). The compositions were adjusted for equal run strength during the year of tagging, and the results were weighted to account for variations in early run strength during 1987. An example of this weighing procedure is presented in Barrett (1988). The composition of the late runs to Karluk River, Red River, and Upper Station Lakes was calculated by weighing the adjusted percentage composition of the early run stocks for variations in individual strength of each run as gauged by escapement strength in 1987.

The harvest of Cook Inlet stocks in the Northwest and Southwest Afognak Sections was based on Barrett (1989a). Approximately 5% of the catch for these sections was not assigned to specific system; it was assumed that these fish were of Kodiak origin.

The catch by stock in each fishery was calculated for each statistical week and area by multiplying the estimated percentage composition for each stock by the weekly catch for each respective statistical area. Each week all (100%) of the catch was assigned to the contributing systems of origin.

### *Escapement Enumeration*

Salmon escapements at Karluk, Red, Buskin, and Saltery Rivers, and Upper Station, Frazer, Afognak, Thorshiem and Pauls Lakes were based on weir counts, surveys below each weir at the end of the season, and estimates of fish passage when the weirs were inoperative.

The primary objective of many aerial stream surveys was to enumerate pink and chum salmon. As a result, sockeye and coho salmon were not always enumerated at periods of peak abundance. Peak counts reflect the highest number of fish counted during the season, not necessarily the total escapement. Cousens et al. (1982) reported that aerial and foot surveys for salmon often underestimate the true escapement by not enumerating the entire population over time. Total escapement estimates were based on the expansion of peak aerial and foot surveys counts. An expansion factor of 2.0 was applied to the peak sockeye escapement counts in most systems (Barrett et al. 1984); in the clear shallow water lakes a 1.25 expansion factor was used (A. Shaul, Larry Malloy, Alaska Department of Fish and Game, Kodiak, personal communication, 1989; Appendix C). An expansion factor of 2.4, based on data presented by Minard (1986), was applied to coho escapement estimates; however, an aerial survey estimate of 50,000 coho in the Karluk River on October 9 was not expanded to avoid multiple enumeration because 42,634 fish had been counted through the weir 9 d earlier.

Pink and chum total escapements were estimated using the method developed by Johnson and Barrett (1988). This technique uses a geometric approach to estimate total escapement by applying an assumed stream-life estimate of 15 d. Escapement estimates for systems with single surveys were expanded by a factor of 1.6 for pink salmon and 1.5 for chum salmon. These expansions were calculated by the Johnson and Barrett model using the ratio of peak counts to total escapement for each species.

Coho escapement surveys on the Kodiak road system and at selected Afognak and Shuyak Island streams were conducted by foot and raft (Figures 2, 4, 5). Weirs and foot surveys were used to count coho escapements on Shuyak Island streams 251-705 and 251-706. Surveys of Kodiak road system streams were conducted during the commercial season and after the fishery during the assumed peak of spawning. In-season surveys covered only the lower main stem of the streams but the post-season spawning surveys included the entire stream. The Shuyak and Afognak Island surveys assessed in-season buildup and initial escapements in the lower reaches of the streams (Brennan 1990).

#### *Run Estimation*

Total run was estimated for all species by combining the total catch (commercial, sport and subsistence) and total escapement estimates. The total sockeye run was projected by system; chinook, coho, pink, and chum runs were summarized by geographic area. This was the second year that the total salmon run was calculated based on estimated total escapements, and differs from the method previously used to describe the area's salmon run (Manthey 1986).

#### *Catch and Escapement Sampling*

The majority of the sampled fish were sexed and measured for length (mid-eye to fork-of-tail). Lengths were taken using a caliper or meterstick, and were accurate within 5 mm. Sex was determined from morphological examination. Scales were taken from the preferred area for age determination (INPFC 1963; Moser 1968). A varying number of scales were taken from each fish: one from sockeye salmon, chinook (catch), chum (catch); two for the Kitoi Hatchery chum salmon; two from coho salmon; four from the chinook escapement.

#### *Sample Sizes*

B.A. Johnson (Alaska Department of Fish and Game, Kodiak, personal communication, 1985) devised catch and escapement sample sizes based on Thompson (1987). Sample sizes were adjusted for the typical age class composition for each species. A sockeye sample of 600 fish was calculated to provide 95% simultaneous confidence levels for each age class. An alternative sampling level of 480 sockeye salmon was used when the sampling size of 600 could not be achieved. The 480 fish sample ensures that at least a 90% confidence level for each age class is obtained. Chum catch samples of 101 to 400 fish were taken on a time available basis. Escapement sample sizes of 280 coho salmon (2 scales per fish) and 240 sockeye salmon were chosen because of logistical considerations, and were

estimated to provide 90% simultaneous confidence levels for each age class within 7% of the true age.

### Catch Sampling

Weekly commercial catch samples of 480 to 600 sockeye salmon were collected from the major fisheries. Chum and coho salmon samples were taken on a time-available basis from fisheries directed at those species. Sampling was conducted at the Columbia Wards Fisheries' processing plant in Lazy Bay, at the Port of Kodiak, Kodiak Salmon Packers at Larsen Bay, and on the fishing grounds by ADF&G crew aboard the M/V COHO (Appendix D; Figure 3).

Sampling bias was minimized by obtaining fish from the unsorted deliveries of salmon tenders which collected individual catches from several fishermen within specific fishing areas. The harvest area of each sample was determined prior to sampling by contacting the processing superintendent and when possible, the tender operator.

### Escapement Sampling

A weekly sample of 240 sockeye salmon was usually collected within a 48 h sampling period at the following weirs: Frazer Lake fishpass, Upper Station, Red River, and Karluk River. Single samples of sockeye salmon were timed to best reflect the peak of the respective runs. A 600-fish sample was to be taken with beach seines at the smaller lake systems. The sampling goal was achieved at Little River, and Saltery Lake, but smaller samples, ranging from 283 to 480 fish, were obtained at Horse Marine Lagoon, Buskin, and Uganik Lakes. Combined weir and seine samples of 438 early-run and 328 late-run fish were obtained at the Afognak River weir and lagoon.

Individual samples of coho salmon were scheduled to occur near the peak of the run at systems with weirs. A sampling goal of 280 fish was achieved at the Karluk River and Dog Salmon River weirs. Two samples of 280 fish were taken at the Red River weir. A total of 240 coho salmon were obtained at Saltery River; 28% of the sample was collected by hook and line. Samples of less than 63 fish were collected at Upper Station and Akalura weirs. The majority of the coho sampled at Shuyak Island were obtained by hook-and-line.

A chinook sample of 364 fish was obtained at the Red River weir from carcasses which drifted down river to the weir.

### *Scale Ageing*

Age was determined from scales obtained from the preferred area of each sampled fish. Scales mounted on gum cards were impressed on cellulose acetate using methods described by Clutter and Whitesel (1956). Scale impressions on acetate cards were aged using a standard microfiche viewer. Ages were recorded in European notation (e.g., 1.3). In this notation the first digit is the number of freshwater annuli and the second digit, following the period, is the number of marine annuli. The total age is the sum of these digits plus one for the year preceding scale development. An adaptation of the NORMSEP program (Hasselblad

and Abramson 1971), developed by Bernard and Sharr was used to determine the saltwater age of reabsorbed scales by examination of the length frequency modes of the sampled population (S. Sharr, Alaska Department of Fish and Game, Cordova, personal communication).

### *Data Processing*

Data in this report were compiled by statistical week using a microcomputer. Age composition and associated standard errors were calculated for weekly catch and escapement samples. Total catch and escapement by age within a statistical week was determined by multiplying the statistical week's age composition proportions by the catch or escapement of that week. Standard error for a particular age class was determined by taking the square root of the variances, as recommended by Cochran (1977) in equation 3.12 (without the finite population correction factor). The standard error provides a measure of the relative precision of the estimate but is not valid for confidence intervals. No standard errors or variances were calculated across statistical weeks. Total catch and escapement by age was obtained by simple summation.

Length compositions by age and sex were determined for each catch and escapement sampled. Mean lengths were computed from an unweighted composite of data collected for each area sampled. Sex composition was computed by statistical week. Seasonal length and sex ratio summaries were weighted according to the respective area's catch or individual system's escapement.

The age structure of each sockeye run was estimated from escapement age composition data. Catch-age data were collected to describe the actual harvest but were not used for determining run age composition for specific systems. The age composition of the assigned catch was projected from the respective week's escapement data by applying lag times of up to 2 weeks. Lag times were based on migration rates rounded to the nearest week. The age composition of the total sockeye run was compiled by system and summarized for the season.

## **RESULTS**

The total 1987 harvest of 7,801,822 salmon included a commercial harvest of 7,747,012 fish, a sport catch of 33,681 fish, and a subsistence harvest of 21,129 fish (Table 1).

The 1987 commercial salmon catch for the management area was 39% less than the 1977-86 average of 12,748,358 fish. The species composition was 4,612 chinook, 1,792,851 sockeye, 192,540 coho, 5,075,027 pink, and 681,982 chum salmon (Tables 2, 3). The smaller catch resulted from reduced runs of pink and sockeye salmon. Pink catches were 51% lower than 1977-86 average of 10,287,792 fish. Although sockeye harvests were 31% higher than the 1977-86 average of 1,368,581 fish, they were 56% lower than the 1986 (70-year record) catch of 3,188,046 fish.

A total of 489 limited entry permit holders made 13,316 landings (Table 3). Purse seine gear was used by 298 permit holders who made 8,298 landings. Beach seines were used by 18 permit holders who made 256 landings. Set gill nets were

used by 173 permit holders who made 4,740 landings. There were nine purse seine landings for the Kitoi Bay hatchery cost recovery program, and 13 landings for test fisheries and confiscated catches. Specific catch and effort data are summarized by gear type, statistical week, and area in Holmes (1990).

The estimated total escapement for 1987 was 6,775,284 salmon, which included 23,739 chinook, 1,679,701 sockeye, 239,669 coho, 3,949,598 pink, and 882,567 chum salmon (Tables 1,4,5). Escapement data are summarized by stream in Appendix E, and Murray (1988).

The estimated total salmon run of 14,577,106 fish included 343,402 Chignik River and 73,870 Cook Inlet sockeye salmon; 14,159,834 fish originated from Kodiak Management Area streams including 28,892 chinook, 3,071,007 sockeye, 455,273 coho, 9,038,482 pink, and 1,566,170 chum salmon (Table 1). Over 90% of these fish originated from systems on the west and south sides of Kodiak Island. The 1987 salmon run, with the exception of chinook salmon, was less than the previous season. The 1986 run of 25,729,693 fish included 16,011 chinook, 5,309,235 sockeye, 490,691 coho, 17,612,528 pink and 2,301,174 chum salmon (Holmes 1989). Earlier unpublished Kodiak Management Area reports estimated salmon runs by combining an escapement index based on weir counts and peak aerial and foot surveys with the total commercial catch for the management area. Estimates of total runs from 1977 to 1986 are presented by species in Appendix F and in Manthey (1986). Although these estimates were derived by a different method, they are valuable to examine for trends in annual salmon runs.

The full data set used in preparing this report is presented without analysis or interpretation in Holmes (1990); those needing more specific data may find that report useful.

### *Chinook Salmon*

The estimated total harvest of 5,153 chinook salmon included a commercial catch of 4,612 fish, a sport catch of 379 fish (Mills 1988), and a subsistence harvest of 162 fish (Table 1). The commercial catch was 72% higher than the 1977-86 average of 2,675 (Table 2). This catch resulted from increased fishing time for the sockeye fisheries combined with increased chinook returns to Red (Ayakulik) River (Malloy, Alaska Department of Fish and Game, Kodiak, personal communication). Nearly 63% of the chinook harvest of 2,890 fish occurred in the Kodiak Archipelago. The largest catch (1,722 fish) was taken in the Mainland District (Table 3). Purse seines harvested approximately 94% of the commercial chinook catch, or 4,379 fish. Only 4 fish were taken with beach seine gear. Set gill net gear harvested 5% of the total chinook catch, or 229 fish.

The total chinook escapement of 23,843 fish was 115% greater than the 1986 escapement of 11,050 salmon; over 98% (23,566 fish) of the escapement entered the Karluk and Red (Ayakulik) Rivers. Small numbers (94) escaped to Frazer Lake and 73 chinook salmon to Lake Rose Tead (Table 5; Appendix E).

The estimated total chinook run was 28,892 fish. This estimate included a total harvest of 5,153 fish and an escapement of 23,739 fish (Table 1).

The majority, or 85.7% of the 42 chinook salmon in a catch sample from the Red River District were age 1.4 (Table 6). The mean length of the fish in this

sample was 853 mm, and the male to female ratio was 0.9 : 1 (Table 7). The limited number of chinook salmon sampled from the Red (Ayakulik) River were primarily age 1.4 (62.7%; Table 8). The mean length of these fish was 735 mm (Table 9), and the male to female ratio was 1.4:1. No estimates of run age, length, and sex composition were made due to limited number of samples and size of the samples.

### *Sockeye Salmon*

The estimated total sockeye harvest of 1,808,578 fish was comprised of a commercial catch of 1,792,851 fish (including 417,272 sockeye from other management areas), a sport catch of 4,165 fish (Mills 1988), and a subsistence harvest of 11,562 fish (Table 1).

The 1987 commercial catch was 31% higher than the 1977-86 average of 1,368,581 fish but was only 56% of the 1986 harvest of 3,188,046 fish (Table 2). Nearly 77% of the catch (1,375,579 fish) originated from the Kodiak Management Area; the balance included 343,402 fish from the Chignik River (Barrett 1989a) and 73,870 fish from Cook Inlet (Barrett 1989b). Fisheries in the Uganik Bay, Uyak Bay, Karluk, Red River, and Alitak Bay Districts, and the Cape Igvak Section of the Mainland District produced 91% of the area harvest. The Alitak Bay District accounted for 29% of the total commercial catch (Table 3). Purse seine gear harvested over 69% of the sockeye catch (1,248,328 fish), beach seines took <1% (1,582 fish), and set gill net gear caught 30% (542,360 fish; Table 3).

The estimated total sockeye escapement was 1,679,701 fish (Tables 1, 10; Appendix E). The majority of the escapement (75%) occurred in three systems: Karluk River, 766,251 fish; Red River, 261,913 fish; and Upper Station, 232,195 fish. Escapements into weired systems were lower than in 1986, with the exception of Pauls and Buskin Lakes (Malloy 1987). Minimum escapement goals were not achieved at Thorshiem Creek, the Red (Ayakulik) River late run, Frazer, Afognak, Pauls, Uganik, Akalura, and Little River Lakes; the desired level was exceeded in the early runs to Karluk and Red River.

The total sockeye run of 3,071,007 fish included 343,402 Chignik River and 73,870 Cook Inlet sockeye salmon. The estimated sockeye run of Kodiak Management Area origin was 3,071,007 fish, including a total harvest of 1,375,579 fish and an estimated escapement of 1,679,701 fish (Tables 1, 10). The Karluk River, Red (Ayakulik) River, and Upper Station Lakes produced the majority (89%) of the run. The percentages used to estimate the composition of each stock and run are presented by fishery in Table 11, and by stock in Table 12.

The majority of the sockeye catch sampled during 1987 was comprised of 4- (14.3%) and 5-year-old (73.5%) fish. The 5-year-olds were mainly age 1.3, and the 4-year-olds were predominantly age 0.3 (Table 13). Sockeye salmon in the Cape Igvak Section harvest prior to July 19 were primarily 4- (7.7%) and 5-year-old (86.4%) fish. Kodiak Management Area sockeye escapements were mainly 5- (51.4%) and 6-year-old (31.1%) fish. The 5-year-old fish were mainly age 2.2, and the 6-year-old fish were primarily age 2.3 (Table 14). The total sockeye run was predominantly 5- (53.1%) and 6- (27.1%) year old fish; the 5-year-old fish were primarily age 2.2, and the 6-year-old fish were mainly age 2.3 (Table 14).

The mean length of sockeye sampled from all catches, excluding the Cape Igvak Section, was 560 mm. The Uganik Bay District sockeye salmon, having a mean length of 566 mm, were the largest fish in the sampled catch (Table 15). The mean length of sockeye salmon in the sampled escapements was 532 mm, and mean lengths ranged from 465 mm at Little River Lake to 574 mm at Horse Marine Lagoon (Table 16).

The mean male to female ratio of the sampled sockeye catch was 1.2:1, and ranged from 0.7:1 at Cape Igvak and Deadman/Portage Bay to 1.2:1 in Uganik and Uyak Bays (Table 15). The mean sex composition of the monitored escapements was 1.2:1, and ranged from 0.8:1 at Afognak, Akalura, and Horse Marine Lakes to 1.7:1 at Saltery Lake (Table 16).

### *Coho Salmon*

The estimated total coho harvest of 215,604 fish included a commercial catch of 192,540 fish, a sport catch of 16,915 fish (Mills 1988), and a subsistence harvest 6,149 fish (Tables 1,4).

The commercial catch was 16% higher than the 1977-86 average of 166,158 fish but was 44% less than the record 1982 harvest of 343,531 fish (Table 2). It was fourth highest on record (Malloy 1987). The majority (84%) of the catch occurred in the Kodiak Archipelago. The General District produced the largest catch of 37,577 fish (Table 3). The largest terminal harvest, 15,899 fish, occurred in the Ayakulik Section of the Red River District (Holmes 1990). Purse seine gear harvested 160,403 fish, nearly 83% of the commercial coho catch, beach seines took approximately 2% (3,703) fish, and set gill nets caught 15% (28,327 fish; Table 3).

The estimated total coho escapement was 239,669 fish (Tables 1,4). This estimate reflects less than the actual escapement for the management area; poor weather and budget reductions prevented comprehensive coho surveys on the Alaska Peninsula (L.Malloy, Alaska Department of Fish and Game, Kodiak, personal communication). Approximately 47% of the coho escapement (111,596 fish) was enumerated at 11 weirs (Table 5; Murray 1988); combined escapements (not-expanded) at 10 of these systems increased nearly 50% over 1986; the Karluk and Afognak River escapements nearly doubled. The balance of the escapement was projected for the numerous small systems monitored by aerial and foot surveys (Appendix E). The largest coho escapements occurred at stream 251-705 on Shuyak Island (1,348 fish), Afognak River on Afognak Island (11,469 fish), Karluk River on Kodiak Island (42,634 fish), and Saltery River on the Kodiak road system (11,376 fish). No data was available for the Alaska Peninsula.

The estimated total coho run of 455,273 fish, included a total harvest of 215,604 fish, and an estimated total escapement of 239,669 fish (Tables 1, 4).

Coho catch samples were collected from five terminal fishing areas (Table 17). Fish in these samples were primarily ages 1.1 (43.9%) and 2.1 (46.6%). Coho salmon sampled from the Red River catch had a mean length of 614 mm and male to female ratio of 1.9:1 (Table 18).

The sampled coho escapements were mainly age 1.1 (19.0%), age 2.1 (60.3%) and age 3.1 (16.1%) fish. The majority of the age 1.1 (24.7%) were in Saltery Creek;

most of the age 2.1 (46.0%) and age 3.1 (89.1%) fish were in the Karluk River (Table 19). The mean length of the sampled coho escapements was 621 mm; mean lengths ranged from 599 mm at Shanigin Bay and Pauls Lake to 646 mm at Dog Salmon Creek (Table 20). The mean male to female ratio was 1.7:1 and ranged from 0.8:1 at Carry Inlet to 2.2:1 at Dog Salmon Creek. Additional age, length, and sex data for selected coho systems are presented in Murray (1988).

### *Pink Salmon*

The estimated total pink harvest of 5,088,884 fish included a commercial pink catch of 5,075,027 salmon, a sport catch of 11,662 fish (Mills 1988), and a subsistence harvest of 2,195 fish (Tables 1, 2, 4,).

The commercial catch was 29% less than the 1977-85 average odd-year harvest of 7,123,005 fish (Table 2), and nearly 725,000 fish less than the mid-point harvest forecast (Malloy 1987). The lower than anticipated catch resulted primarily from weaker runs in the Dakavak, Big River, and the East Afognak Sections, and the Kiliuda Bay area. Runs were stronger than expected occurred in the Portage/Deadman and Alinchak Sections (Malloy 1987). The catch was 31% lower than the 1985 catch (Table 2). The majority (96%) of the pink harvest (4,846,789) occurred in the Kodiak Island Archipelago. The Afognak District produced the largest catch, 1,261,194 fish; approximately 1,070,000 of these fish were produced by the Kitoi Bay Hatchery (Table 3; Malloy 1987). Purse seine gear harvested nearly 86% of the commercial pink catch (4,228,900 fish), beach seines took 3% (135,638 fish), and set gill net gear caught 11% (555,753 fish). Approximately 3% (153,272 fish) of the purse seine harvest was taken in the Kitoi Bay Hatchery cost recovery program (Table 3).

The estimated total pink escapement was 3,949,598 fish. The largest projected escapements occurred at Deadman Creek (318,760 fish) and at Uyak River (288,049 fish; Appendix E).

The estimated total pink run of 9,038,482 fish included a total harvest of 5,088,884 fish and an estimated total escapement of 3,949,598 fish (Tables 1, 4, Appendix E).

Pink salmon were not sampled for age, length or sex composition.

### *Chum Salmon*

The estimated total chum harvest of 683,603 fish included a commercial catch of 681,982 fish, a sport catch of 560 fish (Mills 1988) and a subsistence harvest of 1,061 fish (Tables 1, 2, 4,).

The commercial catch was nearly 40% less than the 1986 harvest 1,134,372 fish, and 26% less than the 1977-86 average catch of 923,152 fish (Table 2). This harvest was about 282,000 less than the preseason forecast of 900,000 fish. The reduced catch was attributed to weak runs in the Big River and Sitkalidak Sections. The Kukak Section of the Mainland Section had excellent production (122,610 fish; Malloy 1987). The majority (66%) of the chum harvest (450,769 fish) occurred in the Kodiak Archipelago. The largest total catch (231,213 fish)

occurred in the Mainland District (Table 3). Purse seine gear harvested 542,009 fish or nearly 80% of the commercial chum catch, beach seines took about 1% (9,462 fish), and set gill net gear caught 19% (129,482 fish; Table 3).

The estimated total chum escapement was 882,567 fish. Big and Kukak Rivers in the Mainland District produced nearly 22% (191,127 fish) of the estimated total chum escapement (Tables 1, 4; Appendix E).

The estimated total chum run was 1,566,170 fish, which included a total catch of 683,603 fish and an estimated total escapement of 882,567 fish (Tables 1, 4).

Chum catch samples were collected from nine terminal fishing areas. The fish in these samples were primarily age 0.3 (57.3%) and 0.4 (39.6%; Table 21). The mean length of the sampled fish was 600 mm and ranged from 564 mm at Sitkinak Lagoon to 630 mm at Zachar Bay (Table 22). The mean male to female ratio was 0.9:1, and ranged from 0.6:1 at Zachar Bay to 1.2:1 at Sulua-Portage and Newman Bays.

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Table 1. Kodiak Management Area salmon catch, escapement and run numbers, 1987.

Species	Catch (No. of Fish)			Total	Estimated Total Escapement	Estimated Total Run
	Commercial	Sport <sup>a</sup>	Subsistence <sup>b</sup>			
Chinook	4,612	379	162	5,153	23,739	28,892
Sockeye						
Local stocks	1,375,579 <sup>c</sup>	4,165	11,562	1,391,306	1,679,701	3,071,007
Area total	1,792,851	4,165	11,562	1,808,578	1,679,701	3,488,921
Coho	192,540	16,915	6,149	215,604	239,669	455,273
Pink	5,075,027	11,662	2,195	5,088,884	3,949,598	9,038,482
Chum	681,982	560	1,061	683,603	882,567	1,566,170
<b>TOTALS</b>						
Kodiak Management Area Origin	7,329,740 <sup>c</sup>	33,681	21,129	7,384,550	6,775,284	14,159,834
Total	7,747,012	33,681	21,129	7,801,882	6,775,284	14,577,106

<sup>a</sup> Mills (1988).

<sup>b</sup> L. Malloy, Alaska Department of Fish and Game, Kodiak, personal communication.

<sup>c</sup> Total excludes 343,402 Chignik River sockeye harvested at the Cape Igvak Section and 73,870 Cook Inlet sockeye from the North and Southwest Afognak Sections (Barrett, 1989<sup>a,b</sup>).

Table 2. Commercial salmon catch by species in the Kodiak Management Area from 1977 to 1987.

Year	Catch (No. of Fish)					Total
	Chinook	Sockeye <sup>a</sup>	Coho	Pink	Chum	
1977	585	623,468	27,920	6,252,405	1,072,313	7,976,691
1978	3,228	1,071,782	48,795	15,004,065	814,345	16,942,215
1979	1,905	631,735	140,629	11,287,591	358,400	12,420,260
1980	529	651,394	139,154	17,290,615	1,075,557	19,157,249
1981	1,418	1,288,980	121,544	10,336,829	1,345,328	13,094,099
1982	1,238	1,204,793	343,531	8,076,203	1,266,187	10,891,952
1983	3,839	1,231,989	157,612	4,603,371	1,085,165	7,081,976
1984	4,657	1,950,439	229,534	10,884,293	649,092	13,718,015
1985	4,970	1,843,185	284,166	7,334,825	430,757	9,897,903
1986	4,381	3,188,046	168,690	11,807,727	1,134,372	16,303,216
1977-1986 Average	2,675	1,368,581	166,158	10,287,792	923,152	12,748,358
1987 <sup>b</sup>	4,612	1,792,851	192,540	5,075,027	681,982	7,747,012

<sup>a</sup> Includes sockeye harvested in the Cape Igvak Section.

<sup>b</sup> Totals in this table vary from data presented in Holmes (1990) by 975 pink and 483 chum salmon.

Table 3. Kodiak Management area commercial salmon catch and effort by district, gear and species, 1987.

District	Gear	Number of Landings	Species (No. of Fish)					Totals
			Chinook	Sockeye	Coho	Pink	Chum	
AFOGNAK DISTRICT	Purse Seine	835	155	105,407	30,243	1,110,922	16,404	1,263,131
	Beach Seine	<sup>a</sup>	0	85	0	0	0	85
	Hatchery	9	0	173	5	153,272	537	153,987
	All Gear	846	155	105,665	30,248	1,264,194	16,941	1,417,203
UGANIK DISTRICT	Purse Seine	744	143	158,799	8,940	406,316	53,734	627,932
	Beach Seine	26	1	165	2	14,274	1,284	15,726
	Set Gillnet	1,554	63	114,557	9,870	227,520	47,841	399,851
	All Gear	2,324	207	273,521	18,812	648,110	102,859	1,043,509
UYAK BAY DISTRICT <sup>b</sup>	Purse Seine	853	375	63,042	13,932	285,584	48,722	411,655
	Beach Seine	78	2	243	62	41,159	964	42,430
	Set Gillnet	1,261	152	95,330	6,990	185,208	52,291	339,971
	All Gear	2,192	529	158,615	20,984	511,951	101,977	794,056
KARLUK DISTRICT	Purse Seine	326	315	50,834	3,351	38,326	15,519	108,345
	Beach Seine	9	0	357	2,155	0	3	2,515
	All Gear	335	315	51,191	5,506	38,326	15,522	110,860
STURGEON RIVER	Purse Seine	520	285	105,017	15,921	160,549	7,542	289,314
	Beach Seine	<sup>a</sup>	0	434	0	29	0	463
	All Gear	521	285	105,451	15,921	160,578	7,542	289,777
RED RIVER	Purse Seine	349	827	67,635	15,594	43,050	2,257	129,363
	All Gear	349	827	67,635	15,594	43,050	2,257	129,363
ALITAK BAY	Purse Seine	1,333	93	192,947	8,473	811,344	37,440	1,050,297
	Beach Seine	33	0	259	8	20,583	425	21,275
	Set Gillnet	1,789	12	322,204	9,478	84,948	21,858	438,500
	Test / Conf. <sup>c</sup>	10	0	106	1	8	4	119
	All Gear	3,165	105	515,516	17,960	916,883	59,727	1,510,191
GENERAL	Purse Seine	1,240	464	33,739	34,081	1,145,896	129,656	1,343,836
	Beach Seine	107	1	39	1,476	59,593	6,786	67,895
	Set Gillnet	136	2	10,269	1,989	58,077	7,492	77,829
	Test / Conf. <sup>c</sup>	1	0	2	11	131	10	154
	All Gear	1,484	467	44,049	37,557	1,263,697	143,944	1,489,714
MAINLAND	Purse Seine	2,098	1,722	470,908	29,868	226,913	230,735	960,146
	Test / Conf. <sup>c</sup>	2	0	300	90	1,325	478	2,193
	All Gear	2,100	1,722	471,208	29,958	228,238	231,213	962,339
Totals <sup>d</sup>	Purse Seine	8,298	4,379	1,248,328	160,403	4,228,900	542,009	6,184,019
	Beach Seine	256	4	1,582	3,703	135,638	9,462	150,389
	Set Gillnet	4,740	229	542,360	28,327	555,753	129,482	1,256,151
	Commercial	13,294	4,612	1,792,270	192,433	4,920,291	680,953	7,590,559
	Hatchery	9	0	173	5	153,272	537	153,987
	Test / Conf. <sup>c</sup>	13	0	408	102	1,464	492	2,466
	Miscellaneous	22	0	581	107	154,736	1,029	156,453
	All Gear	13,316	4,612	1,792,851	192,540	5,075,027	681,982	7,747,012

<sup>a</sup> Number of landings deleted for confidentiality.

<sup>b</sup> Includes Karluk District north of Rocky Point.

<sup>c</sup> Test/Conf. designates test fishery and court confiscated catches.

<sup>d</sup> The fish ticket run used for this table varies slightly from catch data presented in Holmes (Holmes 1990) by 975 pink and 483 chum salmon.

Table 4. Estimated chinook, coho, pink, and chum salmon escapement, catch, and run numbers by area, for the Kodiak Management Area, 1987.

Geographic Area	Numbers of Fish				Total
	Chinook	Coho	Pink	Chum	
<b>Afognak District</b>					
Total Est. Escapement	1	30,509	290,171	11,750	332,431
Commercial Catch	155	30,243	1,110,922	16,404	1,263,389
Misc. Comm. Catch <sup>a</sup>	0	5	153,272	537	153,814
Run	156	60,757	1,554,365	28,691	1,749,634
<b>West side<sup>b</sup></b>					
Total Est. Escapement	23,556	114,222	1,010,592	141,810	1,290,180
Commercial Catch	2,163	76,817	1,402,015	230,157	1,711,152
Run	25,719	191,039	2,412,607	371,967	3,001,332
<b>Alitak District</b>					
Total Est. Escapement	103	30,243	752,801	139,152	922,299
Commercial Catch	105	17,959	916,875	59,723	994,662
Misc. Comm. Catch <sup>a</sup>	0	1	8	4	13
Run	208	48,203	1,669,684	198,879	1,916,974
<b>General District</b>					
Total Est. Escapement	79	62,696	982,011	139,414	1,184,200
Commercial Catch	467	37,546	1,263,566	143,934	1,455,513
Misc. Comm. Catch <sup>a</sup>	0	11	131	10	152
Run	546	100,253	2,245,708	283,358	2,629,865
<b>Mainland District</b>					
Total Est. Escapement	0	2,000	914,022	450,441	1,366,463
Commercial Catch	1,722	29,868	226,913	230,735	489,238
Misc. Comm. Catch <sup>a</sup>	0	90	1,325	478	1,893
Run	1,722	31,958	1,142,260	681,654	1,857,594
<b>MANAGEMENT AREA TOTALS</b>					
Total Est. Escapement	23,739	239,669	3,949,598	882,567	5,095,573
Commercial Catch	4,590	192,433	4,920,291	680,953	5,798,267
Misc. Comm. Catch <sup>a</sup>	22	107	154,736	1,029	155,894
Sport Catch <sup>c</sup>	379	16,915	11,662	560	29,516
Subsistence Catch <sup>d</sup>	162	6,149	2,195	1,061	9,567
Run	28,892	455,273	9,038,482	1,566,170	11,088,817

<sup>a</sup> Miscellaneous commercial catch includes hatchery cost recovery, test fisheries, and confiscated catch.

<sup>b</sup> "West side" includes the Uganik Bay, Uyak Bay, Karluk, Sturgeon River, and Red River Districts.

<sup>c</sup> M. Mills (1988).

<sup>d</sup> L. Malloy, Alaska Department of Fish and Game, Kodiak, personal communication.

Table 5. Salmon escapements enumerated at Kodiak Management Area weirs, 1987.

Weir	Escapement (Nos. of Fish)					Total	
	Chinook		Sockeye	Coho	Pink		Chum
Thorshiem Creek	0		3,888	0	0	0	3,888
Waterfall Fishpass	0		0	0	29,093	0	29,093
Pauls Lake	1		13,122	4,767	202	0	18,092
Portage Fishpass	0		500	3,856	12,094	0	16,450
Afognak River	0	Early Late	18,168 8,306	11,469	8,780	16	46,739
Karluk River	7,930	Early Late	358,525 407,726	42,634 <sup>a</sup>	24,222	449	841,486
Red River (Ayakulik)	15,636	Early Late	182,844 79,069	16,342	7,819	437	291,671
Akalura Creek	0	Early Late	2,769 3,347	1,480	22,791	5	55,319
Upper Station	0	Early Late	74,421 157,774	2,560	1,010	0	235,765
Dog Salmon Creek <sup>b</sup>	103		48,956	6,223	55,993	29,041	140,316
Buskin River <sup>c</sup>	0		12,690	10,889	30,392	79	51,550
Saltery Creek	6		22,705	11,376	39,687	250	74,024
<b>TOTALS</b>	<b>23,676</b>		<b>1,394,801<sup>d</sup></b>	<b>111,596<sup>d</sup></b>	<b>232,083</b>	<b>30,277<sup>d</sup></b>	<b>1,814,869</b>

<sup>a</sup> Weir removed 9/30, aerial survey enumerated 50,000 coho on 10/9, survey not expanded to avoid multiple enumeration of fish.

<sup>b</sup> Escapement at Frazer fishpass: 94 chinook, 40,544 sockeye, 285 pink salmon.

<sup>c</sup> J.B. Murray (1988).

<sup>d</sup> Includes fish below weir at time of removal.

Table 6. Age composition of the sampled Red River District chinook salmon catch, 1987.

	N		Age			Total
			1.2	1.4	1.5	
	42	Percent	2.4	85.7	11.9	100.0
		Number	1	36	5	42
TOTALS	42	Percent	2.4	85.7	11.9	100.0
		Number	1	36	5	42

Table 7. Mean length and sex ratio of the sampled Red River District chinook salmon catch, 1987.

	Length (mm)			Sex	
	N	Mean	SE	N	M:F Ratio
	42	853	10	42	0.9 : 1
Total	42	853	10	42	0.9 : 1

Table 8. Age composition of the sampled Red (Ayakulik) River chinook salmon escapement, 1987.

N		Age					Total
		1.1	1.2	1.3	1.4	1.5	
244	Percent	5.7	14.8	14.8	62.7	20.0	100.0
	Number	14	36	36	153	49	
TOTALS	Percent	5.7	14.8	14.8	62.7	20.0	100.0
	Number	14	36	36	153	49	

<sup>a</sup>Sample obtained from carcasses collected on weir.

Table 9. Mean length and sex ratio of the sampled Red (Ayakulik) River chinook salmon escapement, 1987.

	Length (mm)			Sex	
	N	Mean	SE	N	M:F Ratio
	244	735	19	244	1.4 : 1
Total	244	735	19	244	1.4 : 1

<sup>a</sup>Sample obtained from carcasses collected on the weir.

Table 10. Sockeye salmon catch, escapement and run numbers, by system of origin, Kodiak Management Area, 1987.

System	Estimated Catch	Escapement	Run
Thorshiem Creek	<sup>a</sup>	3,888	3,888 <sup>a</sup>
Afognak Lake, early run	1,309	18,168	19,477
late run	5,938	8,306	14,244
Pauls Lake	476	13,122	13,598
Little River	<sup>a</sup>	25,000 <sup>b</sup>	25,000 <sup>a</sup>
Uganik Lake	9,145	70,000 <sup>b</sup>	79,145
Karluk Lake, early run	171,947	358,525	530,472
late run	288,893	407,726	696,619
Red River, early run	39,734	182,844	222,578
late run	47,418	79,069	126,487
Akalura Lake, early run	<sup>a</sup>	2,769	2,696 <sup>a</sup>
late run	<sup>a</sup>	3,347	3,347 <sup>a</sup>
Upper Station, early run	78,210	74,421	152,631
late run	505,821	157,774	663,595
Frazer Lake	22,072	48,956 <sup>c</sup>	71,028
Buskin Lake	338	12,690	13,028
Saltery Lake	3,406	22,705	26,111
Kaflia Lake	607	68,200 <sup>b</sup>	68,807
Other	200,264	122,191	322,931
Subtotal	1,375,579	1,679,701	3,055,280
Sport	4,165 <sup>d</sup>		
Subsistence	11,562 <sup>e</sup>		
TOTAL	1,391,306 <sup>f</sup>	1,679,701	3,071,007

-Continued-

Table 10. (page 2 of 2)

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<sup>a</sup> Catch data not available.

<sup>b</sup> Estimate based on expansion of peak aerial survey by 2.0:1 (Barrett et al.1984).

<sup>c</sup> A total of 40,554 sockeye entered Frazer Lake at the Frazer fishpass.

<sup>d</sup> M. Mills (1988).

<sup>e</sup> L. Malloy, Alaska Department of Fish and Game, Kodiak, personal communication.

<sup>f</sup> Total excludes 343,402 Chignik River sockeye harvested at the Cape Igvak Section and 73,870 potential Cook Inlet sockeye from the North and Southwest Afognak Sections (Barrett, 1989a,b).

Table 11. Sockeye stock composition and lag times used to assign harvests to system of origin in the Kodiak Management Area, 1987.

District	Section	Statistical Area	Catch Weeks	Lag Times to Nearest Week*	Percent Composition	Stock	Source
Afognak	Southwest Afognak	251-10,20	24-27	1	94.4	Karluk River, early run	Tyler, et al. (1986) <sup>b</sup>
			24-27	1	2.0	Red River, early run	Tyler, et al. (1986) <sup>b</sup>
			24-27	2	2.5	Upper Station, early run	Tyler, et al. (1986) <sup>b</sup>
			24-27	2	1.1	Frazer Lake	Tyler, et al. (1986) <sup>b</sup>
			24-27		100.0	Total	
			28	1	94.5	Karluk River, early run	Tyler, et al. (1986) <sup>b</sup>
			28	1	0.8	Red River, early run	Tyler, et al. (1986) <sup>b</sup>
			28	2	4.7	Upper Station, late run	Tyler, et al. (1986) <sup>b</sup>
			28		100.0	Total	
			29-31	1	95.0	Mixed Cook Inlet	Barrett (1989)
			29-31		5.0	Other Kodiak stocks	Barrett (1989) <sup>c</sup>
			29-31		100.0	Total	
			32-39	2	94.5	Karluk River, late run	Tyler, et al. (1986) <sup>b</sup>
			32-39	1	0.8	Red River, late run	Tyler, et al. (1986) <sup>b</sup>
			32-39	2	4.7	Upper Station, late run	Tyler, et al. (1986) <sup>b</sup>
			32-39		100.0	Total	
			Shuyak Island & Northwest Afognak Statistical Areas	251-30,40,60,70,81	24-28		100.0
	29-31				95.0	Mixed Cook Inlet	Barrett (1989)
	29-31				5.0	Mixed local composition unknown	Barrett (1989)
	32-39				100	Mixed local composition unknown	Barrett (1989)
	North Afognak	251-82,83	24-39	0	100.0	Pauls Lake	Malloy, pers com
	East Afognak	252-33,34,35	24-39	0	100.0	Afognak Lake	Prokopowich, pers com
Uganik Bay	253-11,14,31,32,33,35	24-27	1	94.7	Karluk River, early run	Tyler, et al. (1986) <sup>b</sup>	
		24-27	1	2.0	Red River, early run	Tyler, et al. (1986) <sup>b</sup>	
		24-27	2	2.0	Upper Station, early run	Tyler, et al. (1986) <sup>b</sup>	
		24-27	2	1.3	Frazer Lake	Tyler, et al. (1986) <sup>b</sup>	
		24-27		100.0	Total		
		28	1	95.4	Karluk River, early run	Tyler, et al. (1986) <sup>b</sup>	
		28	1	0.8	Red River, early run	Tyler, et al. (1986) <sup>b</sup>	
		28	2	3.8	Upper Station, late run	Tyler, et al. (1986) <sup>b</sup>	
		28		100.0	Total		
		29	1	95.4	Karluk River, early run	Tyler, et al. (1986) <sup>b</sup>	
		29	1	0.8	Red River, late run	Tyler, et al. (1986) <sup>b</sup>	
		29	2	3.8	Upper Station, late run	Tyler, et al. (1986) <sup>b</sup>	
		29		100.0	Total		
		30-39	2	95.4	Karluk River, late run	Tyler, et al. (1986) <sup>b</sup>	
	30-39	1	0.8	Red River, late run	Tyler, et al. (1986) <sup>b</sup>		
	30-39	2	3.8	Upper Station, late run	Tyler, et al. (1986) <sup>b</sup>		
	30-39		100.0	Total			
	253-12	24-26	0	60.0	Uganik Lake	Manthey, pers com	
		24-26	1	40.0	Karluk Early Run	Manthey, pers com	
		27-37	0	100.0	Uganik Lake	Manthey, pers com	

-Continued-

Table 11. (page 2 of 5)

District	Section	Statistical Area	Catch Weeks	Lag Times to Nearest Week <sup>a</sup>	Percent Composition	Stock	Source
		253-13	24-29	0	60.0	Uganik Lake	Manthey, pers com
			24-29	1	40.0	Karluk Early Run	Manthey, pers com
			24-29		100.0	Total	
			30-39	2	95.4	Karluk River, late run	Tyler, et al. (1986) <sup>b</sup>
			30-39	1	0.8	Red River, late run	Tyler, et al. (1986) <sup>b</sup>
			30-39	2	3.8	Upper Station, late run	Tyler, et al. (1986) <sup>b</sup>
			30-39		100.0	Total	
Uyak Bay <sup>d</sup>		254-10,20,30,40	24-27	1	94.7	Karluk River, early run	Tyler, et al. (1986) <sup>b</sup>
			24-27	1	2.0	Red River, early run	Tyler, et al. (1986) <sup>b</sup>
			24-27	2	2.0	Upper Station, early run	Tyler, et al. (1986) <sup>b</sup>
			24-27	2	1.3	Frazer Lake	Tyler, et al. (1986) <sup>b</sup>
			24-27		100.0	Total	
			28	1	95.4	Karluk River, early run	Tyler, et al. (1986) <sup>b</sup>
			28	1	0.8	Red River, early run	Tyler, et al. (1986) <sup>b</sup>
			28	2	3.8	Upper Station, late run	
			28		100.0	Total	
			29	1	95.4	Karluk River, early run	Tyler, et al. (1986) <sup>b</sup>
			29	1	0.8	Red River, late run	Tyler, et al. (1986) <sup>b</sup>
			29	2	3.8	Upper Station, late run	Tyler, et al. (1986) <sup>b</sup>
			29		100.0	Total	
			30-39	2	95.4	Karluk River, late run	Tyler, et al. (1986) <sup>b</sup>
			30-39	1	0.8	Red River, late run	Tyler, et al. (1986) <sup>b</sup>
			30-39	2	3.8	Upper Station, late run	Tyler, et al. (1986) <sup>b</sup>
			30-39		100.0	Total	
Karluk <sup>e</sup>		255-10	24-30	0	100.0	Karluk River, early run	Terminal Fishery
			31-39	1	100.0	Karluk River, late run	Terminal Fishery
		255-20	24-27	1	94.7	Karluk River, early run	Tyler, et al. (1986) <sup>b</sup>
			24-27	1	2.0	Red River, early run	Tyler, et al. (1986) <sup>b</sup>
			24-27	2	2.0	Upper Station, early run	Tyler, et al. (1986) <sup>b</sup>
			24-27	2	1.3	Frazer Lake	Tyler, et al. (1986) <sup>b</sup>
			24-27		100.0	Total	
			28	1	95.4	Karluk River, early run	Tyler, et al. (1986) <sup>b</sup>
			28	1	0.8	Red River, early run	Tyler, et al. (1986) <sup>b</sup>
			28	2	3.8	Upper Station, late run	
			28		100.0	Total	
			29	1	95.4	Karluk River, early run	Tyler, et al. (1986) <sup>b</sup>
			29	1	0.8	Red River, late run	Tyler, et al. (1986) <sup>b</sup>
			29	2	3.8	Upper Station, late run	Tyler, et al. (1986) <sup>b</sup>
			29		100.0	Total	
			30-39	2	95.4	Karluk River, late run	Tyler, et al. (1986) <sup>b</sup>
			30-39	1	0.8	Red River, late run	Tyler, et al. (1986) <sup>b</sup>
			30-39	2	3.8	Upper Station, late run	Tyler, et al. (1986) <sup>b</sup>
			30-39		100.0	Total	
Sturgeon River <sup>f</sup>		256-30,40	24-27	0	64.3	Red River, early run	Tyler, et al. (1986) <sup>b</sup>
			24-27	2	34.7	Upper Station, early run	Tyler, et al. (1986) <sup>b</sup>
			24-27	2	1.0	Frazer Lake	Tyler, et al. (1986) <sup>b</sup>
			24-27		100.0	Total	
			28-29	0	27.4	Red River, early run	Tyler, et al. (1986) <sup>b</sup>

-Continued-

Table 11. (page 3 of 5)

District	Section	Statistical Area	Catch Weeks	Lag Times to Nearest Week <sup>a</sup>	Percent Composition	Stock	Source
			28-29	2	72.6	Upper Station, late run	Tyler, et al. (1986) <sup>b</sup>
			28-29		100	Total	
			30-39	0	27.4	Red River, late run	Tyler, et al. (1986) <sup>b</sup>
			30-39	2	72.6	Upper Station, late run	Tyler, et al. (1986) <sup>b</sup>
			30-39		100.0	Total	
Red River	Ayakulik	256-10,20	24-27	1	1.5	Karluk, early run	Tyler, et al. (1986) <sup>b</sup>
			24-27	0	91.9	Red River, early run	Tyler, et al. (1986) <sup>b</sup>
			24-27	1	5.3	Upper Station, early run	Tyler, et al. (1986) <sup>b</sup>
			24-27	2	1.3	Frazer Lake	Tyler, et al. (1986) <sup>b</sup>
			24-27		100.0	Total	
			28	1	3.3	Karluk, early run	Tyler, et al. (1986) <sup>b</sup>
			28	0	75.3	Red River, early run	Tyler, et al. (1986) <sup>b</sup>
			28	1	21.4	Upper Station, early run	Tyler, et al. (1986) <sup>b</sup>
			28		100.0	Total	
			29	1	3.3	Karluk, early run	Tyler, et al. (1986) <sup>b</sup>
			29	0	75.3	Red River, early run	Tyler, et al. (1986) <sup>b</sup>
			29	1	21.4	Upper Station, late run	Tyler, et al. (1986) <sup>b</sup>
			29		100.0	Total	
			30-39	2	3.3	Karluk, late run	Tyler, et al. (1986) <sup>b</sup>
			30-39	0	75.3	Red River, late run	Tyler, et al. (1986) <sup>b</sup>
			30-39	1	21.4	Upper Station, late run	Tyler, et al. (1986) <sup>b</sup>
			30-39		100.0	Total	
	Gurney Bay <sup>f</sup>	256-25	24-27	0	72.0	Red River, early run	Tyler, et al. (1986) <sup>b</sup>
			24-27	1	18.1	Upper Station, early run	Tyler, et al. (1986) <sup>b</sup>
			24-27	2	9.9	Frazer Lake	Tyler, et al. (1986) <sup>b</sup>
			24-27		100.0	Total	
			28	0	44.8	Red River, early run	Tyler, et al. (1986) <sup>b</sup>
			28	1	55.2	Upper Station, early run	Tyler, et al. (1986) <sup>b</sup>
			28		100.0	Total	
			29	0	44.8	Red River, early run	Tyler, et al. (1986) <sup>b</sup>
			29	1	55.2	Upper Station, late run	Tyler, et al. (1986) <sup>b</sup>
			29		100.0	Total	
			30-39	0	44.8	Red River, late run	Tyler, et al. (1986) <sup>b</sup>
			30-39	1	55.2	Upper Station, late run	Tyler, et al. (1986) <sup>b</sup>
			30-39		100.0	Total	
Alitak	Cape Alitak	257-10,20	24-27	0	13.0	Red River, early run	Tyler, et al. (1986) <sup>b</sup>
			24-27	1	38.7	Upper Station, early run	Tyler, et al. (1986) <sup>b</sup>
			24-27	2	48.3	Frazer Lake	Tyler, et al. (1986) <sup>b</sup>
			24-27		100.0	Total	
			28	0	6.4	Red River, early run	Tyler, et al. (1986) <sup>b</sup>
			28	1	93.6	Upper Station, early run	Tyler, et al. (1986) <sup>b</sup>
			28		100.0	Total	
			29	0	6.4	Red River, early run	Tyler, et al. (1986) <sup>b</sup>
			29	1	93.6	Upper Station, late run	Tyler, et al. (1986) <sup>b</sup>
			29		100	Total	
			30-39	0	6.4	Red River, late run	Tyler, et al. (1986) <sup>b</sup>
			30-39	1	93.6	Upper Station, late run	Tyler, et al. (1986) <sup>b</sup>
			30-39		100	Total	

-Continued-

Table 11. (page 4 of 5)

District	Section	Statistical Area	Catch Weeks	Lag Times to Nearest Week <sup>a</sup>	Percent Composition	Stock	Source
	Upper Olga Bay (statistical area)	257-30	24-29	0	95.0	Upper Station, early run	Manthey, pers comm
			24-29	0	5.0	Other	Manthey, pers comm
			24-29		100.0	Total	
			30-39	0	95.0	Upper Station, late run	Manthey, pers comm
			30-39	0	5.0	Other	Manthey, pers comm
			30-39		100.0	Total	
	Moser/Olga Bay	257-40 (Lower Olga Bay)	24-29	1	58.0	Frazer Lake	Barrett, BM, 1988
			24-29	0	35.0	Upper Station, early run	Barrett, BM, 1988
			24-29	0	7.0	Other	Barrett, BM, 1988
			24-29		100.0	Total	
			30-39	0	95.0	Upper Station, late run	Barrett, BM, 1988
			30-39	0	5.0	Other	Barrett, BM, 1988
			30-39		100.0	Total	
		257-41 (Moser Bay)	24-28	1	73.0	Frazer Lake	Barrett, BM, 1988
			24-28	0	24.0	Upper Station, early run	Barrett, BM, 1988
			24-28	0	3.0	Other	Barrett, BM, 1988
			24-28		100.0	Total	
			29	0	95.0	Upper Station, early run	Barrett, BM, 1988
			29	0	5.0	Other	Barrett, BM, 1988
			29		100.0	Total	
30-39	30-39	0	95.0	Upper Station, late run	Barrett, BM, 1988		
	30-39	0	5.0	Other	Barrett, BM, 1988		
	30-39		100.0	Total			
	Deadman/Portage	257-50, 60, 70	24-27	0	13.0	Red River, early run	Tyler, et al. (1986) <sup>b</sup>
			24-27	1	38.7	Upper Station, early run	Tyler, et al. (1986) <sup>b</sup>
			24-27	2	48.3	Frazer Lake	Tyler, et al. (1986) <sup>b</sup>
24-27				100.0	Total		
28			0	6.4	Red River, early run	Tyler, et al. (1986) <sup>b</sup>	
28			1	93.6	Upper Station, early run	Tyler, et al. (1986) <sup>b</sup>	
28				100.0	Total		
29			0	6.4	Red River, early run	Tyler, et al. (1986) <sup>b</sup>	
29			1	93.6	Upper Station, late run	Tyler, et al. (1986) <sup>b</sup>	
29				100.0	Total		
30-39	30-39	0	6.4	Red River, late run	Tyler, et al. (1986) <sup>b</sup>		
	30-39	1	93.6	Upper Station, late run	Tyler, et al. (1986) <sup>b</sup>		
	30-39		100.0	Total			
	General	Chiniak	259-21,22	24-41	0	100.0	Buskin River
Ugak				259-41,42	24-39	0	100.0
Mainland	Kukak	262-10,15	24-39	0	100.0	Swikshak River	
	KafLIA	262-30	24-39	0	100.0	KafLIA Lakes	Terminal Fishery

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- <sup>a</sup> Lag times for catch assignments based on limited tagging data and estimates of timing by Kodiak Management Area Biologists, (Tyler, et al., 1986; Manthey, pers comm; Malloy, pers comm).
- <sup>b</sup> Tag recovery data weighed to 1981 and 1987 escapements.
- <sup>c</sup> No directed harvest of Cook inlet occurred in the North Mainland District.
- <sup>d</sup> Includes that portion of the Karluk District (stat area 254-10) north of Rocky Point.
- <sup>e</sup> Includes that portion of the Karluk District south of Rocky Point.
- <sup>f</sup> Tyler et al. (1986) did not indicate the presence of Karluk stocks in this area; however, Nicholson (1978) reported that earlier tagging indicated the presence of these stocks at nearby Halibut Bay.

Table 12. Sockeye salmon catch composition by stock in the Kodiak Management Area, 1987.

Stock	District	Section	Statistical Area	Migration Weeks	Time in Weeks <sup>a</sup>	Percentage of Catch	Source	
Mixed local	Afognak	North Afognak	251-30,40,60,70,81	24-28		100	Barrett, 1989	
				32-39		100	Barrett, 1989	
Mixed Cook In. <sup>b</sup>	Afognak	North Afognak	251-30,40,60,70,81	29-31		94.5	Barrett, 1989	
		S.W. Afognak	251-10,20	29-31		94.5	Barrett, 1989	
Pauls Lake	Afognak	North Afognak	251-82,83	24-39	0	100.0	Malloy, pers comm	
Afognak Lake,	Afognak	East Afognak	252-33,34	24-39	0	100.0	Prokopowich, pers comm	
Uganik Lake	Uganik Bay		253-12	24-26	0	60.0	Manthey, pers com	
			253-12	27-37	0	100.0	Manthey, pers com	
			253-13	24-29	0	60.0	Manthey, pers com	
Karluk River early run	Afognak	Southwest Afognak	251-10,20	24-27	1	94.4	Tyler, et al., 1986 <sup>a</sup>	
				28	1	94.5	Tyler, et al., 1986 <sup>a</sup>	
	Uganik Bay			253-11,14,31,32,33,35	24-27	1	94.7	Tyler, et al., 1986 <sup>a</sup>
					28-29	1	95.4	Tyler, et al., 1986 <sup>a</sup>
					24-26	1	40.0	Manthey, pers com
					24-29	1	40.0	Manthey, pers com
	Uyak Bay <sup>d</sup>			254-10,20,30,40	28-29	1	95.4	Tyler, et al., 1986 <sup>a</sup>
	Karluk <sup>d</sup>			255-10	24-30	0	100.0	Tyler, et al., 1986 <sup>a</sup>
					255-20	24-27	0	94.7
	Red River	Ayakulik		256-10,20	28-29	0	95.4	Tyler, et al., 1986 <sup>a</sup>
					24-27	1	1.5	Tyler, et al., 1986 <sup>a</sup>
					28-29	1	3.3	Tyler, et al., 1986 <sup>a</sup>
	Karluk River, late run	Afognak	Southwest Afognak	251-10,20	29-31	1	4.8	Tyler, et al., 1986 <sup>a</sup>
32-39					2	94.5	Tyler, et al., 1986 <sup>a</sup>	
Uganik Bay				253-11,14,31,32,33,35	30-39	2	95.4	Tyler, et al., 1986 <sup>a</sup>
					30-39	2	95.4	Tyler, et al., 1986 <sup>a</sup>
Uyak Bay <sup>c</sup>				254-10,20,30,40	30-39	2	95.4	Tyler, et al., 1986 <sup>a</sup>
Karluk <sup>d</sup>				255-10	31-39	0	100.0	Tyler, et al., 1986 <sup>a</sup>
					255-20	31-39	1	95.4
Red River	Ayakulik		256-10,20	30-39	2	3.3	Tyler, et al., 1986 <sup>a</sup>	
Red River early run	Afognak	Southwest Afognak	251-10,20	24-27	1	2.0	Tyler, et al., 1986 <sup>a</sup>	
				28	1	0.8	Tyler, et al., 1986 <sup>a</sup>	

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Table 12. (page 2 of 4)

Stock	District	Section	Statistical Area	Migration Weeks	Time in Weeks <sup>a</sup>	Percentage of Catch	Source
	Uganik Bay		253-11, 14, 31, 32, 33, 35	24-27 28	1 1	2.0 0.8	Tyler, et al., 1986 * Tyler, et al., 1986 *
	Uyak Bay <sup>c</sup>		254-10, 20, 30, 40	24-27 28	1 1	2.0 0.8	Tyler, et al., 1986 * Tyler, et al., 1986 *
	Karluk <sup>d</sup>		255-20	24-27 28	1 1	2.0 0.8	Tyler, et al., 1986 * Tyler, et al., 1986 *
	Sturgeon River		256-30, 40	24-27 28-29	0 0	64.3 27.4	Tyler, et al., 1986 * Tyler, et al., 1986 *
	Red River	Ayakulik	256-10, 20	24-27 28-29	0 0	91.9 75.3	Tyler, et al., 1986 * Tyler, et al., 1986 *
		Gurney Bay	256-25	24-27 28-29	0 0	72.0 44.8	Tyler, et al., 1986 * Tyler, et al., 1986 *
	Alitak Bay	Cape Alitak	257-10, 20	24-27 28-29	0 0	13.0 6.4	Tyler, et al., 1986 * Tyler, et al., 1986 *
		Deadman/Portage	257-50, 60, 70	24-27 28-29	0 0	13.0 6.4	Tyler, et al., 1986 * Tyler, et al., 1986 *
Red River late run	Afognak	Southwest Afognak	251-10, 20	29-39	1	0.8	Tyler, et al., 1986 *
	Uganik Bay		253-11, 14, 31, 32, 33, 35 253-13	29-39 30-39	1 1	0.8 0.8	Tyler, et al., 1986 * Tyler, et al., 1986 *
	Uyak Bay <sup>c</sup>		254-10, 20, 30, 40	29-39	1	0.8	Tyler, et al., 1986 *
Upper Station early run	Afognak	Southwest Afognak	251-10, 20	24-27	2	2.5	Tyler, et al., 1986 *
	Uganik Bay		253-11, 14, 31, 32, 33, 35	24-27	2	2.0	Tyler, et al., 1986 *
	Uyak Bay <sup>c</sup>		254-10, 20, 30, 40	24-27	2	2.0	Tyler, et al., 1986 *
	Karluk <sup>d</sup>		255-20	24-27	2	2.0	Tyler, et al., 1986 *
	Sturgeon River		256-30, 40	24-27	2	34.7	Tyler, et al., 1986 *
	Red River	Ayakulik	256-10, 20	24-27 28	1 1	5.3 21.4	Tyler, et al., 1986 * Tyler, et al., 1986 *
		Gurney Bay	256-25	24-27 28	1 1	18.1 55.2	Tyler, et al., 1986 * Tyler, et al., 1986 *
	Alitak Bay	Cape Alitak	257-10, 20	24-27 28	1 1	38.7 93.6	Tyler, et al., 1986 * Tyler, et al., 1986 *
		Upper Olga St. Area	257-30	24-29	0	95.0	Barrett, 1988
	Alitak Bay	Lower Olga St. Area	257-40	24-29	0	35.0	Barrett, 1988
	Alitak Bay	Moser Bay St. Area	257-41	24-28 29	0 0	24.0 95.0	Barrett, 1988 Barrett, 1988
	Alitak Bay	Deadman/Portage	257-50, 60, 70	24-27 28	1 1	38.7 93.6	Barrett, 1988 Barrett, 1988

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Table 12. (page 3 of 4)

Stock	District	Section	Statistical Area	Migration Weeks	Time in Weeks <sup>a</sup>	Percentage of Catch	Source
Upper Station, late run	Afognak	Southwest Afognak	251-10,20	28	2	4.7	Tyler, et al., 1986 *
				29-31	2	0.2	Barrett, 1989
	Uganik Bay		253-11,14,31,32,33,35	32-39	4	4.7	Tyler, et al., 1986 *
				28-39	2	3.8	Tyler, et al., 1986 *
				30-39	2	3.8	Tyler, et al., 1986 *
	Uyak Bay <sup>c</sup>		254-10,20,30,40	28-39	2	3.8	Tyler, et al., 1986 *
	Karluk <sup>d</sup>		255-20	28-39	2	3.8	Tyler, et al., 1986 *
	Sturgeon River Red River	Ayakulik Gurney Bay	256-30,40 256-10,20 256-25	28-39	2	72.6	Tyler, et al., 1986 *
				29-39	1	21.4	Tyler, et al., 1986 *
				29-39	1	55.2	Tyler, et al., 1986 *
	Alitak Bay	Cape Alitak Upper Olga St.Area Moser/Olga Bay Deadman/Portage	257-10,20 257-30 257-40,41 257-50,60,70	29-39	1	93.6	Tyler, et al., 1986 *
				30-39	0	95.0	Barrett, B.M. 1988 *
				30-39	0	95.0	Barrett, B.M. 1988 *
29-39				1	93.6	Barrett, B.M. 1988 *	
Frazer Lake	Afognak	Southwest Afognak	251-10,20	24-27	2	1.1	Tyler, pers comm *
				24-27	2	1.3	Tyler, et al., 1986 *
	Uganik Bay		253-11,14,31,32,33,35	24-27	2	1.3	Tyler, et al., 1986 *
				24-27	2	1.3	Tyler, et al., 1986 *
				24-27	2	1.3	Tyler, et al., 1986 *
	Karluk <sup>d</sup>		255-20	24-27	2	1.3	Tyler, et al., 1986 *
				24-27	2	1.3	Tyler, et al., 1986 *
				24-27	2	1.3	Tyler, et al., 1986 *
	Sturgeon River		256-30,40	24-27	2	1.0	Tyler, et al., 1986 *
				24-27	2	1.0	Tyler, et al., 1986 *
	Uyak Bay <sup>c</sup>		254-10,20,30,40	28-39	2	3.8	Tyler, et al., 1986 *
	Red River	Ayakulik	256-10,20	24-27	2	1.3	Tyler, et al., 1986 *
	Karluk <sup>d</sup>		255-20	28-39	2	3.8	Tyler, et al., 1986 *
24-27				2	9.9	Tyler, et al., 1986 *	
Alitak Bay	Cape Alitak Lower Olga St.Area Moser Bay St. Area Deadman/Portage Moser/Olga Bay	257-10,20 257-40 257-41 257-50,60,70 257-40,41	24-27	2	48.3	Tyler, et al., 1986 *	
			24-29	1	58.0	Barrett, B.M. 1988 *	
			24-28	1	73.0	Barrett, B.M. 1988 *	
			24-27	2	48.3	Barrett, B.M. 1988 *	
			30-39	0	95.0	Barrett, B.M. 1988 *	
Saltery Lake	General	Ugak	259-11	23-39		100.0	Malloy, pers comm
Swikshak River	Mainland	Kukak	262-15	23-39		100.0	Terminal area
Kafliia Lake,	Mainland	Kukak	262-30	23-39		100.0	Terminal area

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- <sup>a</sup> Migration timing for catch assignments based on limited tagging data and estimates of timing by Kodiak Area Management Biologists, (Tyler, et al., 1986, Manthey, pers comm, Malloy, pers comm).
  - <sup>b</sup> No directed harvest of Cook Inlet stocks in the North Mainland District.
  - <sup>c</sup> Tag recovery dated weighted to 1981 and 1987 escapements.
  - <sup>d</sup> Includes that portion of the Karluk District (254-10) north of Rocky Point.
  - <sup>e</sup> Includes that portion of the Karluk District south of Rocky Point.
  - <sup>f</sup> Sockeye traveling to Frazer Lake may hold at the mouth of Dog Salmon Creek for variable periods of a week or more (Malloy, pers comm).

Table 13. Age composition of selected sockeye salmon catches in the Kodiak Management Area, 1987.

Location	Ages															Total
	0.1	0.2	1.1	0.3	1.2	2.1	0.4	1.3	2.2	1.4	2.3	3.1	3.2	2.4	3.3	
Uganik Bay District																
Percent	0.0	0.3	0.0	2.1	4.3	0.1	0.1	44.2	29.8	0.2	14.3	0.0	3.9	0.0	0.7	100.0
Numbers	0	927	23	5,720	11,658	302	273	120,876	81,497	631	39,115	0	10,715	0	1,784	273,521
Uyak Bay District																
Percent	0.0	0.5	0.4	1.1	4.3	1.9	0.0	32.4	36.5	0.4	14.3	0.3	6.7	0.1	1.2	100.0
Numbers	0	798	568	1,813	6,829	3,005	0	51,493	58,016	567	22,721	464	10,596	165	1,895	158,930
Gurney Bay Section, Red River District																
Percent	0.0	0.0	0.0	2.7	6.2	0.0	0.3	48.3	21.0	0.0	21.4	0.0	0.0	0.0	0.0	100.0
Numbers	0	0	0	1,141	2,610	18	124	20,297	8,815	18	8,974	0	0	0	0	41,997
Ayakulik Section, Alitak Bay District																
Percent	0.0	0.1	0.9	1.7	8.7	2.4	0.0	3.5	45.0	0.0	37.8	0.0	0.0	0.0	0.0	100.0
Numbers	0	22	238	437	2,220	610	0	900	11,529	0	9,683	0	0	0	0	25,638
Cape Alitak Section, Alitak Bay District																
Percent	0.2	4.4	0.1	23.9	5.5	0.5	0.0	20.2	41.7	0.0	3.6	0.0	0.0	0.0	0.0	100.0
Numbers	393	7,150	153	38,970	8,985	768	0	32,946	68,026	0	5,803	0	0	55	0	163,249
Upper Olga Bay Statistical Area, Alitak Bay District																
Percent	0.0	0.0	0.0	10.6	2.3	0.0	0.1	51.1	26.9	0.0	8.9	0.0	0.0	0.0	0.0	100.0
Numbers	0	0	0	5,469	1,209	12	35	26,337	13,882	24	4,591	0	0	0	0	51,559
Moser/Olga Bay Section, Alitak Bay District																
Percent	0.0	2.3	0.0	23.0	4.4	0.1	0.0	18.4	48.4	0.0	3.3	0.0	0.0	0.0	0.1	100.0
Numbers	0	6,220	0	62,156	11,950	249	0	49,820	131,081	128	8,959	0	0	0	148	270,711
Deadman/Portage Bay Section, Alitak Bay District																
Percent	0.6	6.7	0.0	2.7	0.4	0.0	0.0	5.8	53.8	0.0	0.0	0.0	0.0	0.0	0.0	100.0
Numbers	2	22	0	9	100	0	0	19	177	0	0	0	0	0	0	329
Cape Igvak Section, Mainland Section																
Percent	0.0	0.1	0.0	0.6	7.0	0.1	0.1	82.3	4.0	0.1	5.8	0.0	0.0	0.0	0.1	100.0
Numbers	0	343	0	2,060	24,038	343	343	282,620	13,736	343	19,917	0	0	0	343	343,402
TOTALS																
Percent	0.0	1.1	0.1	8.6	5.3	0.4	0.0	45.0	28.4	0.1	8.9	0.0	1.6	0.0	0.3	100.0
Numbers	395	15,331	982	117,948	72,043	5,348	624	614,453	388,006	1,752	121,638	464	21,311	220	3,988	1,329,336

Table 14. Age composition of selected sockeye salmon runs in the Kodiak Management Area, 1987.

Statistical Week	Ages															Total
	0.1	0.2	1.1	0.3	1.2	2.1	0.4	1.3	2.2	3.1	1.4	2.3	3.2	2.4	3.3	
Afognak Lake, early run																
Catch <sup>a</sup> :																
Percent	0.0	0.0	3.0	0.0	41.2	1.5	0.0	38.3	3.0	0.0	0.0	13.2	0.0	0.0	0.0	100.0
Numbers	0	0	39	0	539	19	0	501	39	0	0	173	0	0	0	1,310
Escapement:																
Percent	0.0	0.0	4.9	0.0	27.6	0.8	0.0	51.9	1.4	0.0	0.0	13.4	0.0	0.0	0.0	100.0
Numbers	0	0	894	0	5,014	149	0	9,431	248	0	0	2,432	0	0	0	18,168
Run:																
Percent	0.0	0.0	4.8	0.0	28.5	0.9	0.0	51.0	1.5	0.0	0.0	13.4	0.0	0.0	0.0	100.0
Numbers	0	0	933	0	5,553	168	0	9,932	287	0	0	2,605	0	0	0	19,478
Afognak Lake, late run																
Catch <sup>a</sup> :																
Percent	0.4	0.0	6.4	0.0	37.0	1.1	0.0	36.3	4.3	0.0	0.0	14.6	0.0	0.0	0.0	100.0
Numbers	21	0	380	0	2,198	63	0	2,155	254	0	0	866	0	0	0	5,938
Escapement:																
Percent	0.4	0.0	6.4	0.0	37.0	1.1	0.0	36.3	4.3	0.0	0.0	14.6	0.0	0.0	0.0	100.0
Numbers	30	0	532	0	3,074	89	0	3,015	355	0	0	1,212	0	0	0	8,306
Run:																
Percent	0.4	0.0	6.4	0.0	37.0	1.1	0.0	36.3	4.3	0.0	0.0	14.6	0.0	0.0	0.0	100.0
Numbers	51	0	912	0	5,272	152	0	5,170	609	0	0	2,078	0	0	0	14,244
Little River Lake																
Escapement:																
Percent	0.0	0.0	0.6	0.0	47.2	6.7	0.0	5.5	33.8	1.8	0.0	3.8	0.6	0.0	0.0	100.0
Numbers	0	0	150	0	11,800	1,675	0	1,375	8,450	450	0	950	150	0	0	25,000
Uganik Lake																
Catch <sup>a</sup> :																
Percent	0.0	0.4	0.4	3.1	21.6	0.4	0.0	66.2	3.1	0.0	0.0	4.5	0.0	0.0	0.0	100.0
Numbers	0	41	41	288	1,977	41	0	6,055	288	0	0	412	0	0	0	9,143
Escapement:																
Percent	0.0	0.4	0.4	3.2	21.6	0.4	0.0	66.2	3.2	0.0	0.0	4.5	0.0	0.0	0.0	100.0
Numbers	0	315	315	2,207	15,135	315	0	46,351	2,207	0	0	3,153	0	0	0	69,998
Run:																
Percent	0.0	0.4	0.4	3.2	21.6	0.4	0.0	66.2	3.2	0.0	0.0	4.5	0.0	0.0	0.0	100.0
Numbers	0	356	356	2,495	17,112	356	0	52,406	2,495	0	0	3,565	0	0	0	79,141

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Table 14. (page 2 of 4)

Statistical Week	Ages															Total
	0.1	0.2	1.1	0.3	1.2	2.1	0.4	1.3	2.2	3.1	1.4	2.3	3.2	2.4	3.3	
Karluk River, early run																
Catch*:																
Percent	0.0	0.0	0.0	0.1	2.0	3.7	0.0	3.7	43.7	0.5	0.0	34.4	8.1	0.0	3.9	100.0
Numbers	0	0	0	235	3,370	6,297	0	6,294	75,087	922	0	59,101	13,935	0	6,711	171,952
Escapement:																
Percent	0.0	0.0	0.0	0.1	1.9	1.9	0.0	4.7	45.6	1.0	0.0	27.6	8.9	0.0	8.4	100.0
Numbers	0	0	0	429	6,646	6,668	0	16,731	163,509	3,722	0	98,774	31,835	0	30,212	358,526
Run:																
Percent	0.0	0.0	0.0	0.1	1.9	2.4	0.0	4.3	45.0	0.9	0.0	29.8	8.6	0.0	7.0	100.0
Numbers	0	0	0	664	10,016	12,965	0	23,025	238,596	4,644	0	157,875	45,770	0	36,923	530,478
Karluk River, late run																
Catch*:																
Percent	0.1	0.3	0.0	0.4	1.4	4.8	0.0	2.1	49.8	0.3	0.0	27.6	9.8	0.0	3.4	100.0
Numbers	246	771	0	1,269	3,946	13,815	0	6,168	143,793	811	0	79,828	28,388	61	9,792	288,888
Escapement:																
Percent	0.0	0.1	0.0	0.7	0.7	3.3	0.0	0.7	49.1	0.2	0.0	32.3	6.8	0.2	5.8	100.0
Numbers	199	429	0	3,001	2,708	13,537	0	3,048	200,262	651	0	131,667	27,725	986	23,511	407,724
Run:																
Percent	0.1	0.2	0.0	0.6	1.0	3.9	0.0	1.3	49.4	0.2	0.0	30.4	8.1	0.2	4.8	100.0
Numbers	445	1,200	0	4,270	6,654	27,352	0	9,216	344,055	1,462	0	211,495	56,113	1,047	33,303	696,612
Red River, early run:																
Catch*:																
Percent	0.0	0.0	1.4	0.8	7.9	3.2	0.1	4.8	41.6	0.0	0.0	38.9	1.3	0.2	0.0	100.0
Numbers	0	0	563	299	3,126	1,255	31	1,923	16,529	0	0	15,441	506	61	0	39,734
Escapement:																
Percent	0.0	0.0	3.2	0.8	5.9	5.0	0.1	5.3	31.7	0.1	0.0	46.4	1.0	0.4	0.1	100.0
Numbers	0	0	5,874	1,476	10,783	9,097	176	9,656	58,011	170	87	84,784	1,918	645	170	182,847
Run:																
Percent	0.0	0.0	2.9	0.8	6.2	4.7	0.1	5.2	33.5	0.1	0.0	45.0	1.1	0.3	0.1	100.0
Numbers	0	0	6,437	1,775	13,909	10,352	207	11,579	74,540	170	87	100,225	2,424	706	170	222,581
Red River, late run																
Catch*:																
Percent	0.0	0.0	0.8	0.0	5.2	4.1	0.0	2.9	29.0	0.2	0.0	35.9	20.7	0.0	1.1	100.0
Numbers	0	0	392	0	2,467	1,966	0	1,377	13,755	105	0	17,014	9,810	0	533	47,418
Escapement:																
Percent	0.0	0.0	0.5	0.0	4.3	1.8	0.0	2.9	29.3	0.0	0.0	43.8	15.6	0.0	1.7	100.0
Numbers	0	0	432	0	3,374	1,417	0	2,262	23,191	33	0	34,654	12,325	0	1,382	79,069

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Table 14. (page 3 of 4)

Statistical Week	Ages															Total
	0.1	0.2	1.1	0.3	1.2	2.1	0.4	1.3	2.2	3.1	1.4	2.3	3.2	2.4	3.3	
Run:																
Percent	0.0	0.0	0.5	0.0	4.3	1.8	0.0	2.9	29.3	0.0	0.0	43.8	15.6	0.0	1.7	100.0
Numbers	0	0	433	0	3,379	1,421	0	2,265	23,220	33	0	34,690	12,346	0	1,383	79,169
Akalura Lake, late run																
Escapement:																
Percent	0.0	0.0	5.2	0.5	49.5	4.2	0.0	27.1	2.1	0.0	0.0	11.4	0.0	0.0	0.0	100.0
Numbers	0	0	144	14	1,370	115	0	750	58	0	0	317	0	0	0	2,769
Akalura Lake, early run																
Escapement:																
Percent	0.0	0.6	0.6	0.6	60.1	1.7	0.0	6.4	23.1	0.0	0.0	6.9	0.0	0.0	0.0	100.0
Numbers	0	19	19	19	2,012	58	0	213	774	0	0	232	0	0	0	3,347
Upper Station, early run																
Catch*:																
Percent	0.0	0.1	0.0	1.7	3.5	1.6	0.0	53.6	24.4	0.0	0.1	14.9	0.0	0.0	0.0	100.0
Numbers	0	102	0	1,363	2,767	1,258	0	41,919	19,077	0	104	11,621	0	0	0	78,211
Escapement:																
Percent	0.0	0.1	0.0	0.8	3.8	0.8	0.0	52.3	257.0	0.0	0.0	16.5	0.0	0.0	0.0	100.0
Numbers	0	56	0	607	2,822	619	0	38,893	19,127	0	22	12,262	0	0	13	74,421
Run:																
Percent	0.0	0.1	0.0	1.3	3.7	1.2	0.0	52.9	25.0	0.0	0.1	15.6	0.0	0.0	0.0	100.0
Numbers	0	158	0	1,970	5,589	1,877	0	80,812	38,204	0	126	23,883	0	0	13	152,632
Upper Station, late run																
Catch*:																
Percent	0.9	8.7	0.0	23.6	4.0	0.4	0.0	17.0	41.8	0.0	0.0	3.6	0.0	0.0	0.1	100.0
Numbers	4,410	43,886	66	119,254	20,398	1,781	222	85,908	211,424	0	0	18,011	0	0	462	505,821
Escapement:																
Percent	0.4	7.0	0.1	25.0	4.3	0.3	0.0	17.2	42.9	0.0	0.0	2.7	0.0	0.0	0.0	100.0
Numbers	675	11,012	154	39,451	6,783	491	34	27,090	67,696	0	0	4,322	0	0	65	157,774
Run:																
Percent	0.8	8.3	0.0	23.9	4.1	0.3	0.0	17.0	42.1	0.0	0.0	3.4	0.0	0.0	0.1	100.0
Numbers	5,085	54,898	220	158,705	27,181	2,272	256	112,998	279,120	0	0	22,333	0	0	527	663,595
Horse Marine Lake																
Escapement:																
Percent	0.0	0.0	0.0	0.0	8.4	0.0	0.0	70.3	0.0	1.3	0.0	20.1	0.0	0.0	0.0	100.0
Numbers	0	0	0	0	879	0	0	7,381	0	132	0	2,109	0	0	0	10,500

-Continued-

Table 14. (page 4 of 4)

Statistical Week	Ages															Total
	0.1	0.2	1.1	0.3	1.2	2.1	0.4	1.3	2.2	3.1	1.4	2.3	3.2	2.4	3.3	
Frazer Lake Catch <sup>a</sup> :																
Percent	0.0	0.0	0.3	0.0	16.4	12.8	0.0	52.6	6.4	0.1	0.5	10.9	0.0	0.1	0.0	100.0
Numbers	0	0	67	0	3,613	2,826	0	11,604	1,410	17	102	2,414	0	17	0	22,070
Escapement:																
Percent	0.0	0.0	1.7	0.1	13.1	17.0	0.0	49.5	7.4	0.2	0.2	10.6	0.0	0.3	0.1	100.0
Numbers	0	0	681	24	5,331	6,888	0	20,059	2,981	62	67	4,284	0	117	49	40,543
Run:																
Percent	0.0	0.0	1.2	0.0	14.3	15.5	0.0	50.6	7.0	0.1	0.3	10.7	0.0	0.2	0.1	100.0
Numbers	0	0	748	24	8,944	9,714	0	31,663	4,391	79	169	6,698	0	134	49	62,613
Buskin Lake Catch <sup>a</sup> :																
Percent	0.0	0.0	0.6	1.8	3.8	0.0	0.0	66.0	4.7	0.0	0.0	23.1	0.0	0.0	0.3	100.0
Numbers	0	0	2	6	13	0	0	223	16	0	0	78	0	0	1	338
Escapement:																
Percent	0.0	0.0	0.6	1.8	3.8	0.0	0.0	65.9	4.7	0.0	0.0	22.9	0.0	0.0	0.3	100.0
Numbers	0	0	75	224	485	0	0	8,360	597	0	0	2,911	0	0	37	12,690
Run:																
Percent	0.0	0.0	0.6	1.8	3.8	0.0	0.0	65.9	4.7	0.0	0.0	22.9	0.0	0.0	0.3	100.0
Numbers	0	0	77	230	498	0	0	8,583	613	0	0	2,989	0	0	38	13,028
Saltery Lake Catch <sup>a</sup> :																
Percent	0.0	0.4	0.8	0.8	54.1	0.0	0.0	36.9	4.4	0.0	0.0	2.7	0.0	0.0	0.0	100.0
Numbers	0	13	26	26	1,841	0	0	1,256	151	0	0	92	0	0	0	3,405
Escapement:																
Percent	0.0	0.4	0.8	0.8	54.1	0.0	0.0	36.9	4.4	0.0	0.0	2.7	0.0	0.0	0.0	100.0
Numbers	0	88	175	175	12,273	0	0	8,372	1,008	0	0	614	0	0	0	22,705
Run:																
Percent	0.0	0.4	0.8	0.8	54.1	0.0	0.0	36.9	4.4	0.0	0.0	2.7	0.0	0.0	0.0	100.0
Numbers	0	101	201	201	14,114	0	0	9,628	1,159	0	0	706	0	0	0	26,110
TOTAL:																
Catch <sup>a</sup> :																
Percent	0.4	3.8	0.1	10.5	3.9	2.5	0.0	14.1	41.0	0.2	0.0	17.5	4.5	0.0	1.5	
Numbers	4,677	44,813	1,576	122,740	46,255	29,321	253	165,383	481,823	1,855	206	205,051	52,639	139	17,499	1,174,228
Escapement:																
Percent	0.1	0.8	0.6	3.2	6.1	2.8	0.0	13.8	37.2	0.4	0.0	26.1	5.0	0.1	3.8	
Numbers	904	11,919	9,445	47,627	90,489	41,118	210	202,987	548,475	5,220	176	384,677	73,953	1,748	55,439	1,474,387
Run:																
Percent	0.2	2.1	0.4	6.4	5.2	2.7	0.0	13.9	38.9	0.3	0.0	22.3	4.8	0.1	2.8	100.0
Numbers	5,581	56,732	11,021	170,367	136,744	70,439	463	368,370	1,030,298	7,075	382	589,728	126,592	1,887	72,938	2,648,615

<sup>a</sup>Catch assigned to system of origin.

Table 15. Mean lengths and sex ratios of selected sockeye salmon catches in the Kodiak Management Area, 1987.

Location	Length (mm)			Sex	
	N	Mean	SE	N	M:F Ratio
Uganik Bay District	3,677	566	1	4,207	1.2 : 1
Uyak Bay District <sup>a</sup>	3,134	552	1	3,608	1.2 : 1
Ayakulik Section	796	531	2	919	1.0 : 1
Gurney Bay Section	508	553	2	600	0.9 : 1
Cape Alitak Section	3,800	560	1	4,273	1.0 : 1
Upper Olga Bay Statistical Area	1,992	553	1	2,198	0.8 : 1
Moser/Olga Bay Section	3,776	564	0	4,184	0.9 : 1
Deadman/Portage Section	137	533	3	156	0.7 : 1
Cape Igvak Section	1,579	576	1	1,792	0.7 : 1
TOTAL	19,399	564 <sup>b</sup>		21,937	1.2 : 1 <sup>b</sup>
KODIAK STOCKS <sup>c</sup>	17,607	560 <sup>b</sup>		20,145	1.1 : 1 <sup>b</sup>

<sup>a</sup> Includes catches from that portion of the Karluk District north of Rocky Point.

<sup>b</sup> Total weighted by catch.

<sup>c</sup> Excludes sample from Cape Igvak.

Table 16. Mean lengths and sex ratios of selected sockeye salmon escapements in the Kodiak Management Area, 1987.

System	Run	Escapement	Length (mm)			Sex	
			N	Mean	SE	N	M:F Ratio
Afognak Lake	Early	18,168	363	509	4	436	0.8 : 1
	Late	8,306	278	514	4	329	0.8 : 1
Little River		25,000	404	465	3	498	1.4 : 1
Uganik Lake		70,000	222	548	4	248	1.0 : 1
Karluk	Early	358,525	1,659	531	1	1,914	0.9 : 1
	Late	407,726	1,427	542	1	1,671	1.3 : 1
Red River	Early	182,844	1,054	524	2	1,417	1.4 : 1
	Late <sup>a</sup>	79,069	842	549	2	1,240	1.1 : 1
Akalura Lake	Early	2,769	189	489	6	224	0.8 : 1
	Late	3,347	168	529	3	203	0.8 : 1
Upper Station	Early	74,421	1,493	560	1	1,712	1.2 : 1
	Late	15,774	1,605	564	1	1,935	1.2 : 1
Horse Marine		10,500	274	574	2	284	0.8 : 1
Frazer		40,544	868	509	3	1,044	1.2 : 1
Buskin Lake		12,690	340	551	2	480	1.1 : 1
Saltery Lake		22,705	518	532	2	610	1.7 : 1
TOTALS		1,332,388	11,704	532	<sup>a</sup>	14,245	1.2 : 1 <sup>a</sup>

<sup>a</sup> Weighted by escapement.

Table 17. Age composition of selected coho salmon catches in the Kodiak Management Area, 1987.

Location	Statistical Area	N		Age				Total
				2.0	1.1	2.1	3.1	
Duck Bay	252-31	239	Percent	0.0	41.8	55.2	2.9	100.0
			Number	0	2,523	3,330	177	6,030
Spiridon Bay	254-40	194	Percent	0.0	1.0	52.1	46.9	100.0
			Number	0	64	3,239	2,918	6,221
Red River	256-20	224	Percent	0.4	54.5	44.2	0.9	100.0
			Number	58	7,069	5,737	116	12,980
Swikshak Beach	262-15	98	Percent	0.0	50.0	45.9	4.1	100.0
			Number	0	3,458	3,175	282	6,915
Bear Bay	262-25	82	Percent	0.0	63	37	0	100
			Number	0	3,272	1,888	0	5,160
TOTALS		657	Percent Number	0.0 58	43.9 16,386	46.6 17,369	9.4 3,493	100.0 37,306

Table 18. Mean length and sex ratio of the Red River District coho catches, 1987.

Location	Statistical Area	Length (mm)			Sex	
		N	Mean	SE	N	M:F Ratio
Red River	256-10	224	614	3	278	1.9 : 1
TOTAL		224	614		278	1.9 : 1

Table 19. Age composition of selected coho salmon escapements in the Kodiak Management Area, 1987.

SYSTEM	N		Age					Total	
			2.0	3.0	1.1	2.1	3.1		4.1
Shangin Bay	24	Percent	0.0	0.0	54.2	45.8	0.0	0.0	100.0
		Number	0	0	958	810	0	0	1,768
Carry Inlet	13	Percent	0.0	0.0	56.4	43.6	0.0	0.0	100.0
		Number	0	0	687	531	0	0	1,218
Big Bay	44	Percent	0.0	0.0	43.2	45.4	11.4	0.0	100.0
		Number	0	0	1,015	1,067	268	0	2350
Pauls Bay	123	Percent	2.4	0.0	6.5	78.1	13.0	0.0	100.0
		Number	114	0	310	3,723	620	0	4,767
Karluk River	202	Percent	3.0	2.5	3.0	59.3	32.2	0.0	100.0
		Number	1,279	1,066	1,279	25,282	13,728	0	42,634
Red (Ayakulik) River	452	Percent	0.0	0.5	42.7	55.0	1.8	0.0	100.0
		Number	0	82	6,978	8,988	294	0	16,342
Akalura Lagoon	17	Percent	0.0	0.0	17.6	70.6	11.8	0.0	100.0
		Number	0	0	260	1,045	175	0	1,480
Upper Station	36	Percent	8.3	0.0	27.8	61.1	2.8	0.0	100.0
		Number	212	0	712	1,564	72	0	2,560
Dog Salmon Creek	226	Percent	0.4	0.9	17.3	77.4	4.0	0.0	100.0
		Number	25	57	1,094	4,894	253	0	6,323
Saltery Creek	280	Percent	0.8	4.7	34.1	60.4	0.0	0.0	100.0
		Number	93	549	3,982	7,052	0	0	11,676
TOTALS		Percent	1.9	1.9	19.0	60.3	16.9	0.0	100.0
		Totals	1,725	1,753	17,275	54,956	15,409	0	91,118

Table 20. Mean lengths and sex ratios of selected coho salmon escapements in the Kodiak Management Area, 1987.

System <sup>a</sup>	Escapement	Length (mm)			Sex	
		N	Mean	SE	N	M:F Ratio
Shanigin Bay <sup>b</sup>	1,768	24	599	7	29	1.2 : 1
Carry Inlet <sup>b</sup>	1,218	39	605	6	51	0.8 : 1
Big Bay <sup>b</sup>	2,350	37	610	8	61	1.1 : 1
Pauls Lake	4,767	123	599	5	145	0.6 : 1
Karluk	42,634	202	627	6	280	1.9 : 1
Red River	16,342	452	597	3	559	1.7 : 1
Akalura Creek	1,480	17	631	9	21	1.3 : 1
Upper Station	2,560	36	602	13	18	1.4 : 1
Dog Salmon Creek	6,223	226	646	4	280	2.2 : 1
Saltery Creek	11,676	183	625	3	280	1.2 : 1
TOTALS	85,682	1,239	621 <sup>c</sup>		1,583	1.7 : 1 <sup>c</sup>

<sup>a</sup> Length and sex ratio data for coho escapement in the Buskin River, Portage Creek, Big Bay and Pauls Bay are presented in Murray (1988).

<sup>b</sup> Majority of samples obtained by hook and line.

<sup>c</sup> Mean weighted by escapement.

Table 21. Age composition of selected chum salmon catches in the Kodiak Management Area, 1987.

Location	Statistical Area	N		Age				Total
				0.2	0.3	0.4	0.5	
Kitoi Bay Hatchery	252-32	200	Percent	0.5	98.0	1.5	0.0	100.0
			Number	29	5,634	86	0	5,749
Zachar Bay	254-30	544	Percent	0.9	26.0	72.0	1.1	100.0
			Number	116	3,524	9,752	150	13,543
Deadman/Portage Bay Section	257-50	217	Percent	0.4	51.2	47.4	1.0	100.0
			Number	3	366	339	7	715
Salua/Portage Bay	257-60	216	Percent	0.0	70.4	28.7	0.9	100.0
			Number	0	8,016	3,270	105	11,391
Newman Bay	258-51	373	Percent	1.1	45.1	53.4	0.6	100.0
			Number	25	1,052	1,246	13	2,335
Kiliuda Bay	258-20	207	Percent	1	68.1	29.5	1.4	100.0
			Number	439	30,919	13,376	658	45,392
Sitkinak Lagoon	258-80	225	Percent	0.4	46.2	53.3	0.0	100.0
			Number	35	3,658	4,221	0	7,915
Chiniak Beach	262-15	86	Percent	10.5	30.3	57.0	2.3	100.0
			Number	141	407	766	31	1,345
Kukak Bay	262-25	303	Percent	3.3	54.5	41.6	0.7	100.0
			Number	3,486	57,516	43,922	697	105,621
TOTALS		2371	Percent	2.2	57.3	39.6	0.9	100.0
			Number	4,271	110,726	0 76,639	1,654	193,291

Table 22. Mean lengths and sex ratios of selected chum salmon catches in the Kodiak Management Area, 1987.

Location	Length (mm)			Sex	
	N	Mean	SE	N	M:F Ratio
Zachar Bay	544	630	2	601	0.6 : 1
Deadman/Portage Bay Section	217	593	2	239	0.7 : 1
Sulua/ Portage Bay	216	599	2	239	1.2 : 1
Newman Bay	373	579	2	399	1.2 : 1
Sitkinak Lagoon	255	564	2	239	1.1 : 1
Kukak Bay	302	600	2	120	0.9 : 1
TOTALS	1,907	600 <sup>a</sup>		1,837	0.9 : 1 <sup>a</sup>

<sup>a</sup>Mean weighted by respective catch.

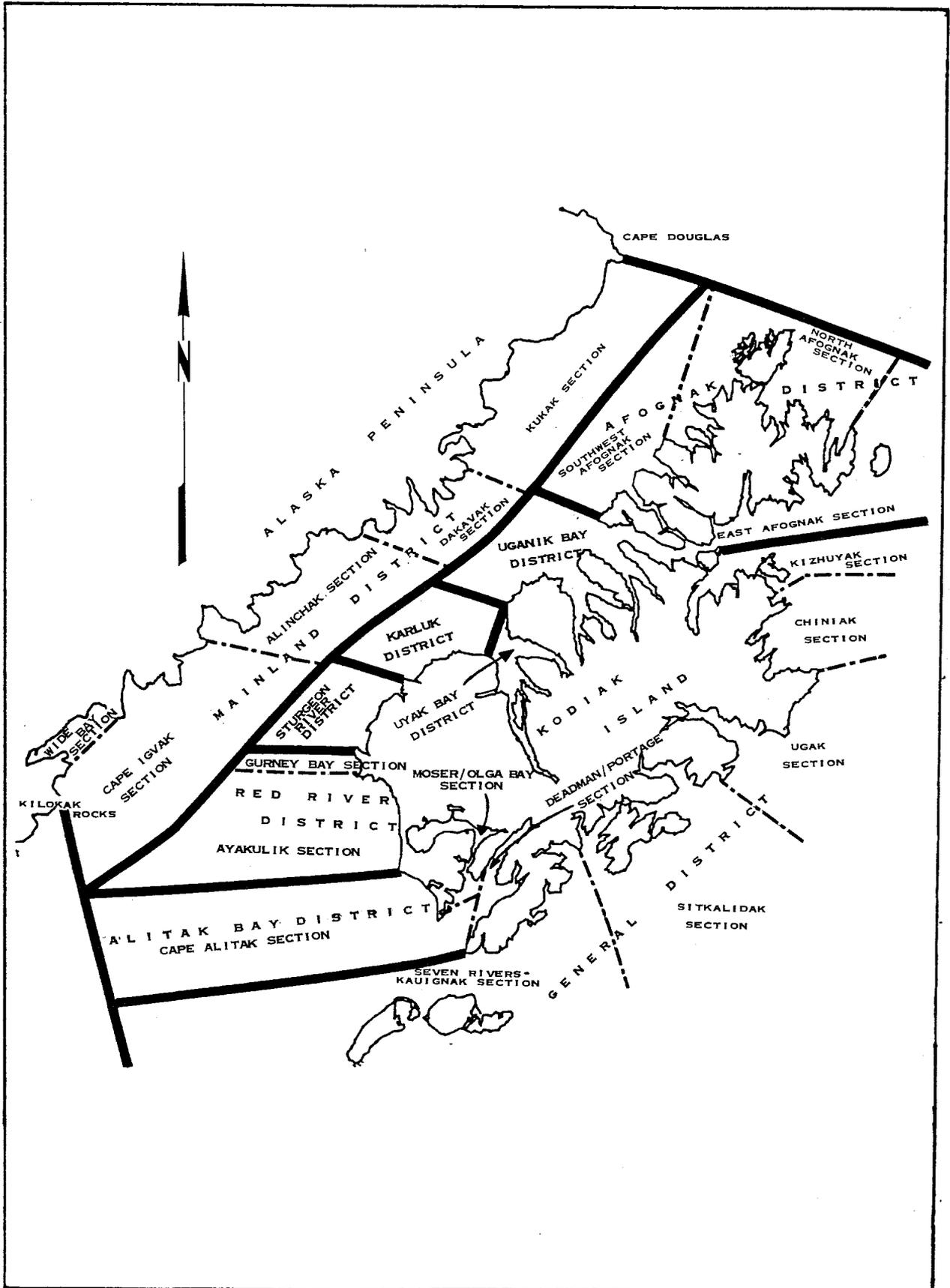


Figure 1. Kodiak Management Area districts and sections, 1987.

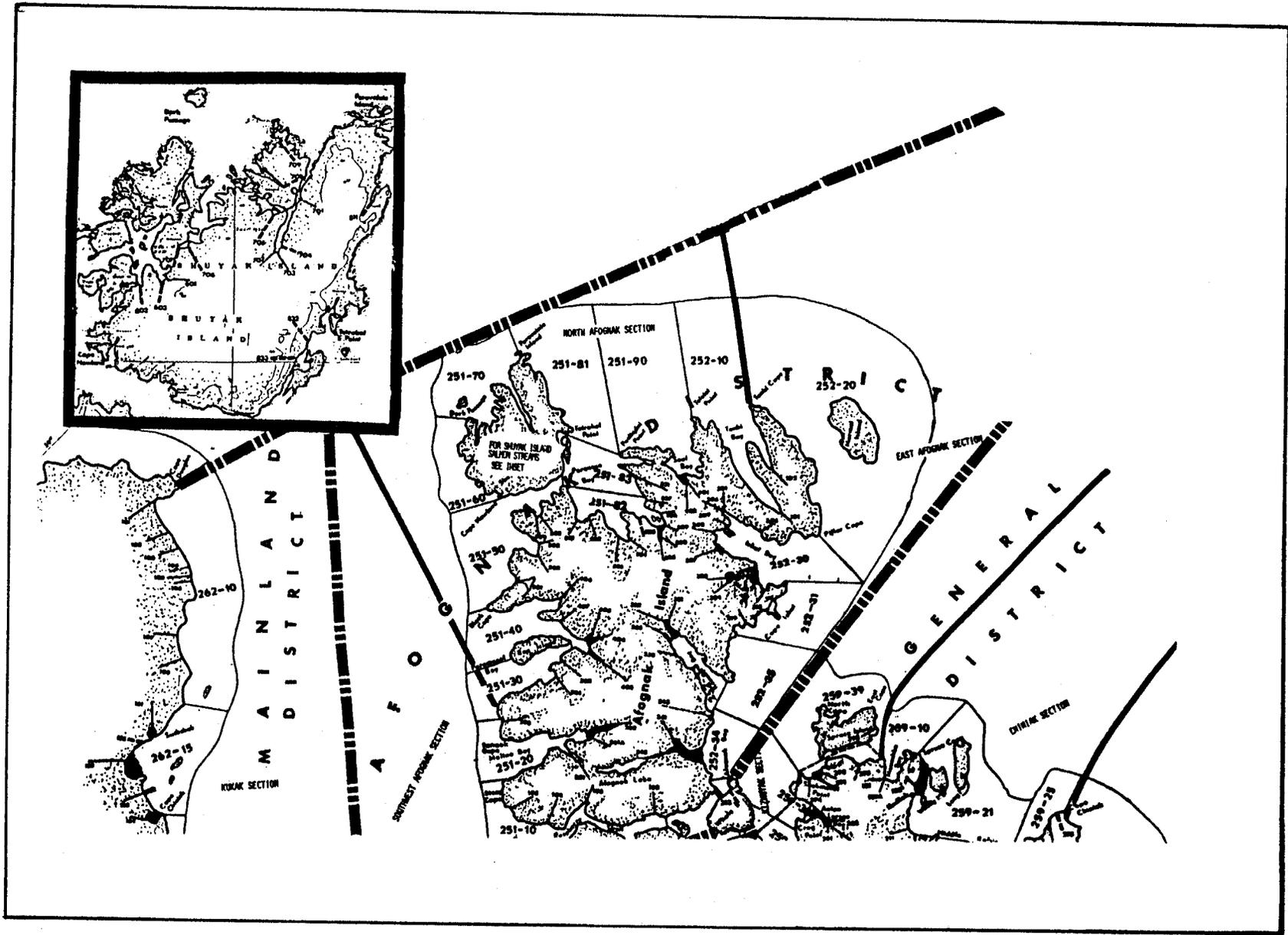


Figure 2. Kodiak Management Area districts and statistical areas, 1987.

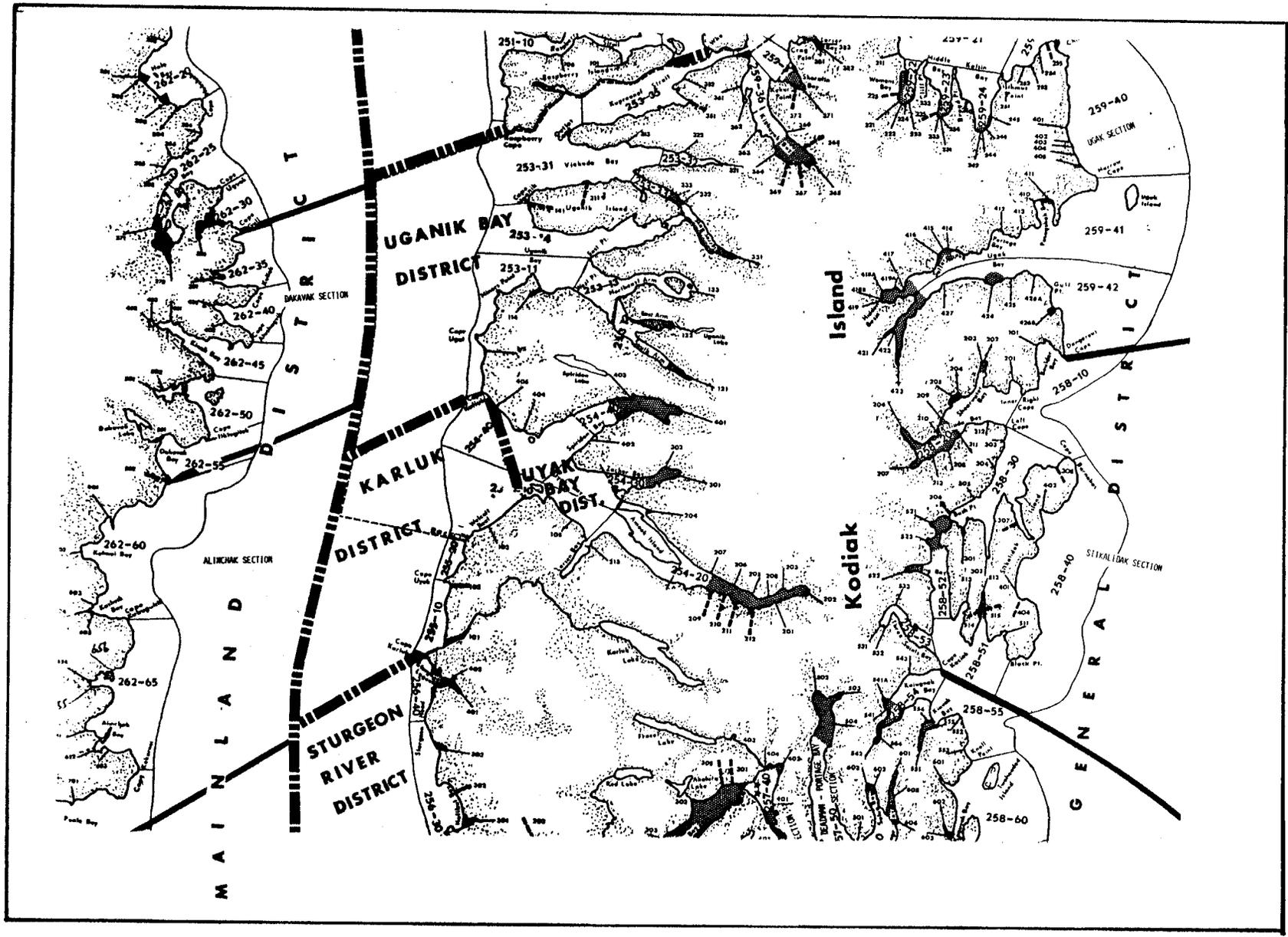


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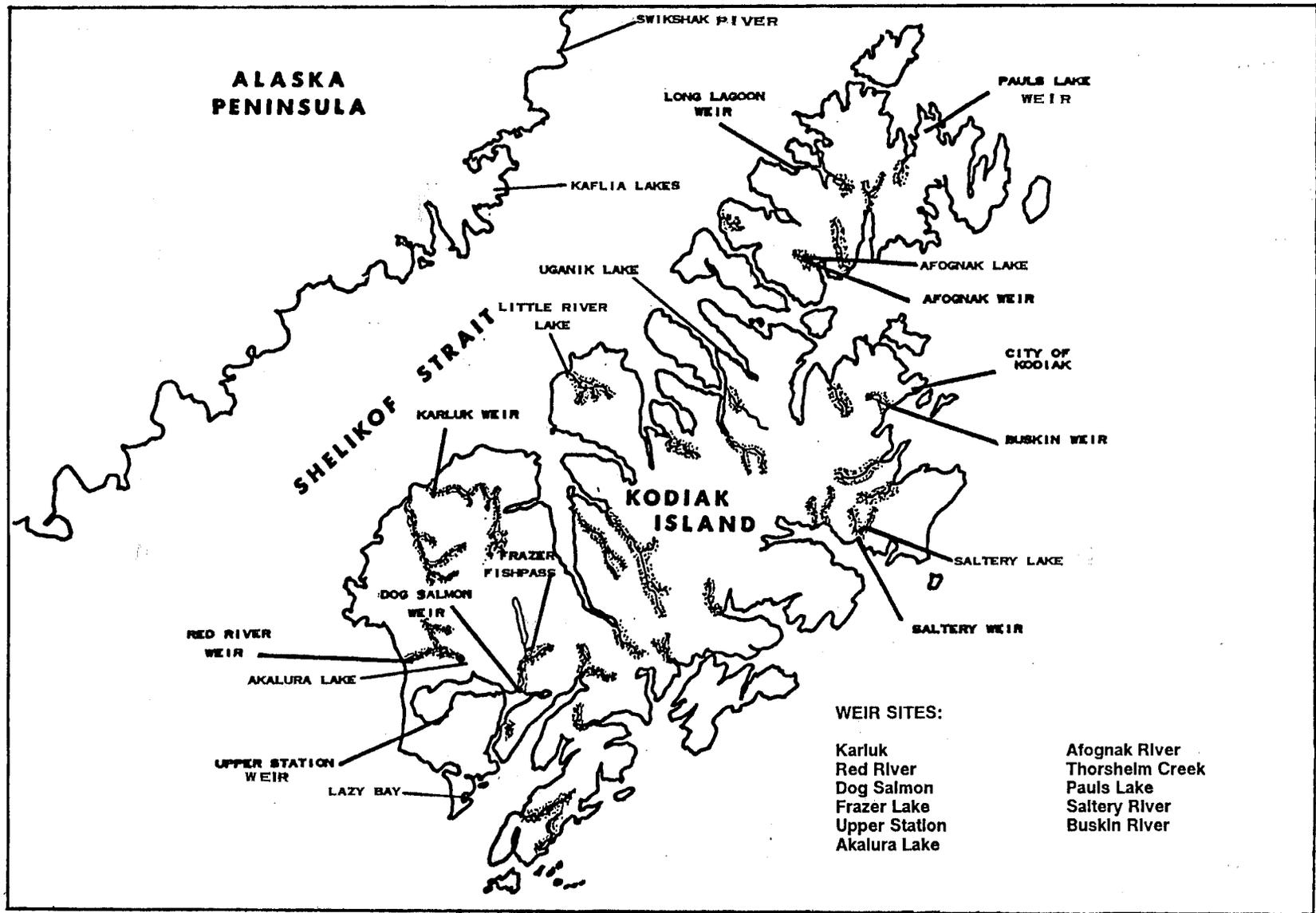


Figure 3. Kodiak catch and escapement sampling sites, 1987.

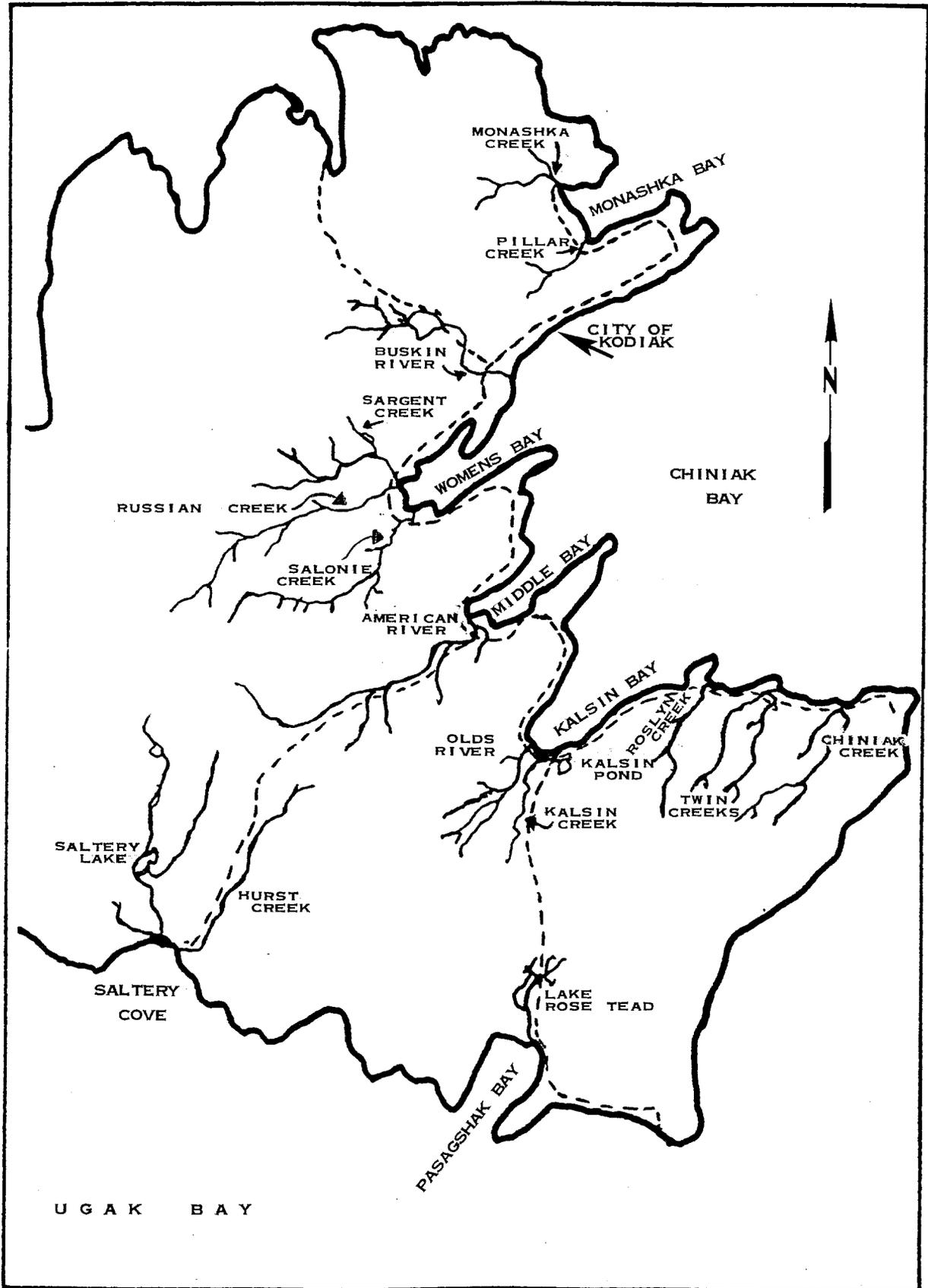


Figure 4. Location of the coho streams on the Kodiak road system.

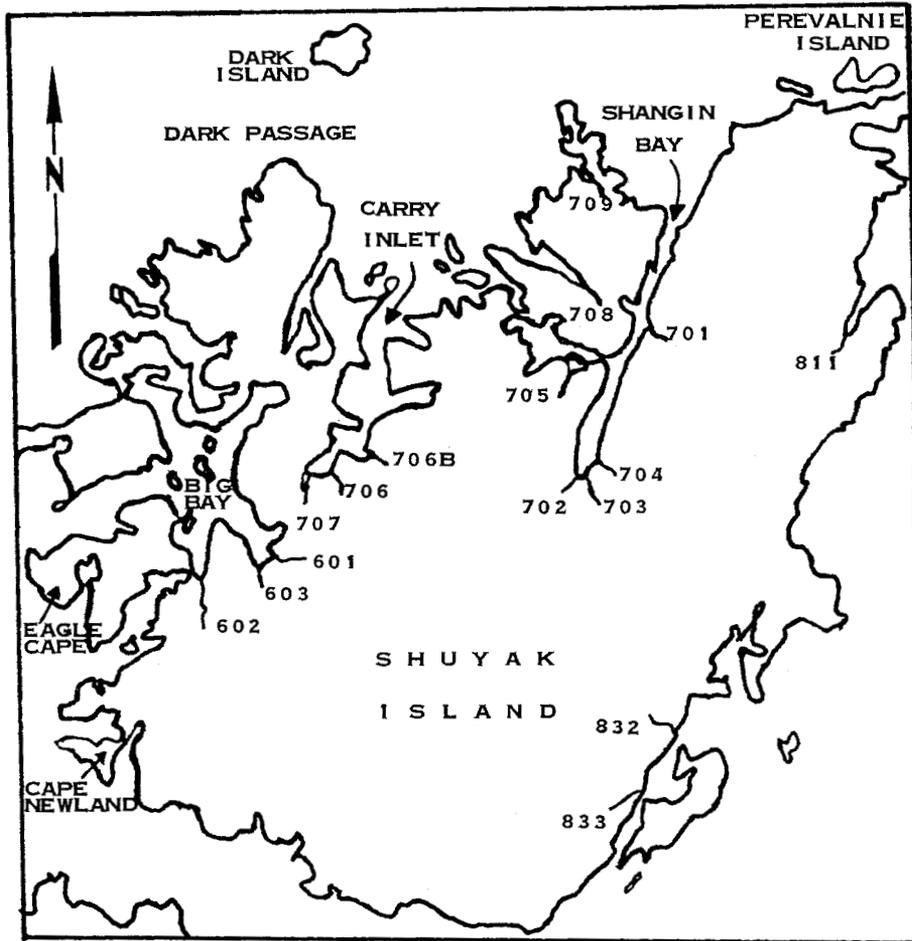


Figure 5. Location of the coho streams on Shuyak Island.

Appendix A. Allowable commercial salmon gear in the Kodiak Management Area by statistical area, 1987.

DISTRICT	STATISTICAL AREA	PURSE SEINE	BEACH SEINE	SET GILLNET
AFOGNAK DISTRICT				
Southwest Afognak Section	251-10	X	X	
	251-20	X	X	
North Afognak Section	251-30	X	X	
	251-40	X	X	
	251-50	X	X	
	251-60	X	X	
	251-70	X	X	
	251-81	X	X	
	251-82	X	X	
	251-83	X	X	
	251-90	X	X	
	252-10	X	X	
	East Afognak Section	252-20	X	X
252-30		X	X	
252-31		X	X	
252-32		X	X	
252-33		X	X	
252-34		X	X	
252-35		X	X	
UGANIK BAY DISTRICT				
	253-11	X	X	X
	253-12	X	X	
	253-13	X	X	X
	253-14	X	X	X
	253-31	X	X	X
	253-32	X	X	
	253-33	X	X	X
	253-35	X	X	X
UYAK BAY DISTRICT				
	254-10	X	X	X
	254-20	X	X	X
	254-30	X	X	X
	254-40	X	X	X
KARLUK DISTRICT				
	254-10	X	X	X
	254-40	X	X	X
	255-10	X	X	
	255-20	X	X	
STURGEON RIVER DISTRICT				
	256-30	X	X	
	256-40	X	X	
RED RIVER DISTRICT				
Gurney Bay Section	256-25	X	X	
Ayakulik Section	256-10	X	X	
	256-20	X	X	
ALITAK BAY DISTRICT				
Cape Alitak Section	257-10	X	X	
	257-20	X	X	
Moser Bay	257-41 <sup>a</sup>	X	X	X
Lower Olga Bay	257-40 <sup>a</sup>	X	X	X
Upper Olga Bay	257-30 <sup>a</sup>	X	X	X
Deadman-Portage Bay Section	257-50	X	X	
	257-60	X	X	
	257-70	X	X	

-Continued-

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DISTRICT	STATISTICAL AREA	PURSE SEINE	BEACH SEINE	SET GILLNET	
GENERAL DISTRICT					
Seven Rivers-Kauignak Section	258-55	X	X		
	258-60	X	X		
	258-70	X	X		
	258-80	X	X		
	258-85	X	X		
	258-90	X	X		
	258-10	X	X		
	258-20	X	X		
	258-30	X	X		
	258-40	X	X		
	Sitkalidak Section	258-52	X	X	
		258-53	X	X	
		258-54	X	X	
	Ugak Section	259-40	X	X	
259-41		X	X		
259-42		X	X		
Chiniak Section	259-10	X	X		
	259-21	X	X		
	259-22	X	X		
	259-23	X	X		
	259-24	X	X		
	259-25	X	X		
Kizhuyak Section	259-36	X	X	X	
	259-37	X	X	X	
	259-38	X	X	X	
	259-39	X	X	X	
MAINLAND DISTRICT					
Kukak Section	262-10	X	X		
	262-15	X	X		
	262-20	X	X		
	262-25	X	X		
	262-27	X	X		
	262-30	X	X		
	Dakavak Section	262-35	X	X	
262-40		X	X		
262-45		X	X		
262-50		X	X		
262-55		X	X		
Alinchak Section	262-60	X	X		
	262-65	X	X		
	262-70	X	X		
Cape Igvak Section	262-75	X	X		
	262-80	X	X		
	262-85	X	X		
	262-90	X	X		
	262-95	X	X		

<sup>a</sup> In the Moser-Olga Bay Section of the Alitak District, salmon may not be taken by purse seine or beach seines before 5 September.

Appendix B. Statistical weeks by calendar date, 1987.

STATISTICAL WEEK	CALENDAR DATES	STATISTICAL WEEK	CALENDAR DATES
1	01/01 to 01/03	28	07/05 to 07/11
2	01/04 to 01/10	29	07/12 to 07/18
3	01/11 to 01/17	30	07/19 to 07/25
4	01/18 to 01/24	31	07/26 to 08/01
5	01/25 to 01/31	32	08/02 to 08/08
6	02/01 to 02/07	33	08/09 to 08/15
7	02/08 to 02/14	34	08/16 to 08/22
8	02/15 to 02/21	35	08/23 to 08/29
9	02/22 to 02/28	36	08/30 to 09/05
10	03/01 to 03/07	37	09/06 to 09/12
11	03/08 to 03/14	38	09/13 to 09/19
12	03/15 to 03/21	39	09/20 to 09/26
13	03/22 to 03/28	40	09/27 to 10/03
14	03/29 to 04/04	41	10/04 to 10/10
15	04/05 to 04/11	42	10/11 to 10/17
16	04/12 to 04/18	43	10/18 to 10/24
17	04/19 to 04/25	44	10/25 to 10/31
18	04/26 to 05/02	45	11/01 to 11/07
19	05/03 to 05/09	46	11/08 to 11/14
20	05/10 to 05/16	47	11/15 to 11/21
21	05/17 to 05/23	48	11/22 to 11/28
22	05/24 to 05/30	49	11/29 to 12/05
23	05/31 to 06/06	50	12/06 to 12/12
24	06/07 to 06/13	51	12/13 to 12/19
25	06/14 to 06/20	52	12/20 to 12/26
26	06/21 to 06/27	53	12/27 to 12/31
27	06/28 to 07/04		

Appendix C. Discussion of expansion factor for shallow, clear-water sockeye systems.

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Sockeye escapements for small, shallow, clear-water lakes were expanded by a factor of 1.25. A. Shaul in a personal communication to J. McCullough (1989) stated that from his experience in conducting stream surveys of this type of system, that an expansion factor of 2.0 was unreasonable. L. Malloy, Kodiak Area Finfish Management Biologist, (Alaska Department of Fish and Game, Kodiak, personal communication) concurred that the smaller expansion factor could be applied to selected escapements for Kodiak Island. A case in point was Lake Rose Tead with a peak escapement survey of 14,000 fish, which compared to the escapement of 12,690 fish counted through the weir at the Buskin River. Buskin Lake, less than 20 miles away, is considered to be a more productive sockeye system. Malloy believed that applying the 1.25 expansion factor for an estimated escapement of 17,500 fish would be more appropriate than a 2.0 factor for a projected escapement of 28,000 fish.

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Appendix D. Commercial salmon catch sampling locations and catch areas sampled, 1987.

Sampling Location	Catch Area	Gear Type Sampled	Species Sampled			
			Sockeye	Coho	Chum	Chinook
Port of Kodiak	Afognak District	purse seine		X	X	
	Uganik Bay District	seine and gillnet	X			
	Uyak Bay District	gillnet and seine	X	X		
	Spiridon Bay	purse seine		X		
	Kitoi Bay	purse seine				X
	Sitkalidak Section	purse seine				X
	Mainland District	purse seine	X	X	X	
Lazy Bay	Red River District	purse seine	X	X		X
	Cape Alitak Section	purse seine	X			
	Moser/Olga Bay Section	gillnet	X			
	Deadman/Portage Section	purse seine	X		X	
	Santa Flavia/Kiliuda	purse seine			X	
	Newman Bay	purse seine			X	
	Sitkinak Lagoon	purse seine			X	
	Cape Igvak Section	purse seine	X			
M.V. Coho	Mainland District	purse seine			X	
	Zachar Bay	purse seine			X	

Appendix E. Salmon peak escapement counts and estimated total escapement, by stream, for the Kodiak Management Area, 1987.

Stream Number	Chinook		Sockeye		Coho		Pink		Chum		Total
	Peak Count	Est.Tot. Escape.	Peak Count	Est.Tot. Escape.	Peak Count	Est.Tot. Escape. <sup>a</sup>	Peak Count	Est.Tot. Escape. <sup>b</sup>	Peak Count	Est.Tot. Escape. <sup>c</sup>	Est.Tot. Escape.
Selief											
251-101	0	0	300	600 <sup>d</sup>	900	2,160	7,500	10,010	0	0	12,770
Muskomee											
251-103	0	0	0	0	0	0	0	0	0	0	0
Dolphin Creek											
251-104	0	0	0	0	0	0	0	0	0	0	0
Malina Creek											
251-105	0	0	1,500	3,000 <sup>d</sup>	0	0	3,200	5,173	0	0	8,173
Malka Creek											
251-201A	0	0	0	0	0	0	0	0	0	0	0
Long Lagoon											
251-301		0		0	10	24		5,500		1,200	6,724
Thorsheim Creek											
251-302		0		3,888		0		0		0	3,888
Paramanof South Arm											
251-403	0	0	0	0	0	0	0	0	0	0	0
Paramanof East Arm											
251-404	0	0	0	0	0	0	6,500	23,600	0	0	23,600
Big Creek											
251-601	0	0	0	0	1,300	1,300 <sup>e</sup>	0	0	0	0	1,300
Twin Creek											
251-602	0	0	0	0	750	750 <sup>e</sup>	0	0	0	0	750
Little Creek											
251-603	0	0	0	0	300	300 <sup>e</sup>	0	0	0	0	300
Western Inlet											
251-604	0	0	0	0	60	60 <sup>e</sup>	0	0	0	0	60
251-701	0	0	0	0	25	25 <sup>e</sup>	0	0	0	0	25
251-702	0	0	0	0	325	325 <sup>e</sup>	0	0	0	0	325
Whitey's Hole											
251-705	0	0	0	0	1,348	1,348	0	0	0	0	1,348
Bear Creek											
251-706	0	0	0	0	833	833	0	0	0	0	833
Inside Creek											
251-707	0	0	0	0	350	350 <sup>e</sup>	0	0	0	0	350

-Continued-

Appendix E. (page 2 of 13)

Stream Number	Chinook		Sockeye		Coho		Pink		Chum		Total
	Peak Count	Est.Tot. Escape.	Peak Count	Est.Tot. Escape.	Peak Count	Est.Tot. Escape. <sup>a</sup>	Peak Count	Est.Tot. Escape. <sup>b</sup>	Peak Count	Est.Tot. Escape. <sup>c</sup>	Est.Tot. Escape.
Middle Creek 251-710	0	0	0	0	200	200 <sup>a</sup>	0	0	0	0	200
Willy's Creek 251-711	0	0	0	0	150	150 <sup>a</sup>	0	0	0	0	150
Big Waterfall 251-821	0	0	0	0	0	0	3,500	3,500	0	0	3,500
Little Waterfall 251-822		0		0		0		29,093		2	29,095
Delphin Is. Creek 251-823	0	0	0	0	0	0	0	0	0	0	0
Portage Creek Fishpass 251-825		0		500		3,856		12,094		0	16,450
Bean Creek 251-827	0	0	0	0	0	0	0	0	0	0	0
Pauls Lake 251-831		1		13,122		4,767		0 202		0	18,092
Slough Bight Creek 251-903	0	0	0	0	0	0	0	0	0	0	0
252-343	0	0	0	0	0	0	0	0	0	0	0
252-302	0	0	0	0	0	0	0	0	0	0	0
252-305	0	0	0	0	0	0	7,000	7,000	0	0	7,000
Saposa 252-306	0	0	0	0	0	0	0	0	0	0	0
Ruth Bay 252-307	0	0	0	0	0	0	750	750	0	0	750
252-308	0	0	0	0	0	0	8,000	8,000	0	0	8,000
252-309	0	0	1,300	2,600 <sup>d</sup>	0	0	3,800	3,800	0	0	6,400
252-317	0	0	0	0	0	0	0	0	0	0	0
Little Afognak 252-319	0	0	0	0	0	0	0	0	0	0	0
Little Kitoi 252-323	0	0	0	0	1,030	2,472	0	0	0	0	2,472
Kitoi Bay Hatchery 252-324		0		0		0		153,482		6,265	159,747
N.E. Danger 252-331	0	0	0	0	50	120	1,200	1,280	700	1,050	2,450

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Appendix E. (page 3 of 13)

Stream Number	Chinook		Sockeye		Coho		Pink		Chum		Total
	Peak Count	Est.Tot. Escape.	Peak Count	Est.Tot. Escape.	Peak Count	Est.Tot. Escape. <sup>a</sup>	Peak Count	Est.Tot. Escape. <sup>b</sup>	Peak Count	Est.Tot. Escape. <sup>c</sup>	Est.Tot. Escape.
Big Danger											
252-332	0	0	6	12	0	0	2,700	3,697	298	517	4,225
252-333	0	0	0	0	0	0	900	1,560	500	500	2,060
252-335	0	0	0	0	0	0	0	0	0	0	0
Afognak River											
252-342		0		26,474		11,469		8,780		16	46,739
Marka Creek											
252-343	0	0	0	0	0	0	7,100	11,530	0	0	11,530
252-371	0	0	0	0	0	0	700	1,120	2,200	2,200	3,320
252-901	0	0	0	0	0	0	0	0	0	0	0
Little River											
253-115	0	0	12,500	25,000 <sup>d</sup>	200	480	41,000	65,600	6,000	8,000	99,080
253-121	0	0	0	0	0	0	16,000	25,600	0	0	25,600
Uganik Lake											
253-122	0	0	35,000	70,000 <sup>d</sup>	1,750	4,200	160,000	276,333	15,000	25,988	376,521
253-201	0	0	0	0	0	0	0	0	0	0	0
253-203	0	0	0	0	0	0	0	0	0	0	0
253-301	0	0	0	0	0	0	0	0	0	0	0
Viekoda Creek											
253-321	0	0	0	0	0	0	2,600	3,120	400	400	3,520
253-323	0	0	0	0	0	0	4,000	4,000	4,000	4,000	8,000
Terror River											
253-331	0	0	0	0	50	120	60,000	158,863	15,000	44,382	203,365
Baumann's											
253-332	0	0	0	0	0	0	14,000	24,000	0	0	24,000
Helgason's Creek											
253-333	0	0	0	0	0	0	100	160	0	0	160
Uyak 201											
254-201	0	0	0	0	0	0	1,600	3,568	2,050	2,050	5,618
Uyak River											
254-202	0	0	0	0	0	0	93,000	288,049	10,000	27,778	315,827
East Uyak											
254-203	0	0	0	0	0	0	30,000	30,000	0	0	30,000
Brown's Lagoon											
254-204	0	0	0	0	1,500	3,600	8,500	36,233	0	0	39,833
254-205	0	0	0	0	0	0	17,000	17,000	0	0	17,000
254-206	0	0	0	0	0	0	3,000	3,000	0	0	3,000
254-207	0	0	0	0	0	0	4,800	4,800	0	0	4,800
254-208	0	0	0	0	0	0	2,000	2,000	0	0	2,000

-Continued-

Appendix E. (page 4 of 13)

Stream Number	Chinook		Sockeye		Coho		Pink		Chum		Total
	Peak Count	Est.Tot. Escape.	Peak Count	Est.Tot. Escape.	Peak Count	Est.Tot. Escape. <sup>a</sup>	Peak Count	Est.Tot. Escape. <sup>b</sup>	Peak Count	Est.Tot. Escape. <sup>c</sup>	Est.Tot. Escape.
Zachar River											
254-301	0	0	0	0	8,000	19,200	20,000	30,000	5,000	7,500	56,700
254-302	0	0	0	0	0	0	0	0	0	0	0
Spiridon River											
254-401	0	0	0	0	7,000	16,800	0	0	0	0	16,800
254-404	0	0	0	0	0	0	450	720	0	0	720
Karluk River											
255-101		7,930		766,251	50,000	50,000 <sup>f</sup>	24,222	24,222	449	449	848,852
Red (Ayakulik) River											
256-201		15,636		261,913		16,342		7,819		437	302,147
Caramel											
256-301	0	0	0	0	500	1,200	3,440	5,504	0	0	6,704
Halibut											
256-302	0	0	0	0	150	360	0	0	0	0	360
Grant's											
256-303	0	0	0	0	800	1,920	0	0	0	0	1,920
Sturgeon											
256-401	0	0	0	0	0	0	0	0	12,200	20,827	20,827
Little Sukoi											
257-101	0	0	0	0	0	0	0	0	0	0	0
Sukoi Lagoon Creek											
257-102	0	0	0	0	0	0	0	0	2,500	50,500	50,500
Akalura Creek											
257-302		0		6,116		1,480		22,791		5	30,392
Silver Salmon											
257-303	0	0	6,000	12,000 <sup>d</sup>	300	300 <sup>f</sup>	0	0	0	0	12,300
Upper Station											
257-304		0		232,195		2,560		1,010		0	235,765
Horse Marine Lake											
257-402	0	0	8,400	16,800 <sup>d</sup>	200	480	1,200	3,540	0	0	20,820
Dog Salmon Creek (outlet to Frazer Lake)											
257-403		103		48,956		6,223		55,993		29,041	140,316
Frazer Lake											
257-403		94		40,544		0		285		5	40,643

-Continued-

Appendix E. (page 5 of 13)

Stream Number	Chinook		Sockeye		Coho		Pink		Chum		Total
	Peak Count	Est.Tot. Escape.	Peak Count	Est.Tot. Escape.	Peak Count	Est.Tot. Escape. <sup>a</sup>	Peak Count	Est.Tot. Escape. <sup>b</sup>	Peak Count	Est.Tot. Escape. <sup>c</sup>	Est.Tot. Escape.
Chip Cove 257-405	0	0	0	0	0	0	0	0	0	0	0
Deadman Creek 257-502	0	0	0	0	8,000	19,200	83,200	318,760	16,000	37,881	375,841
Alpine Cove Creek 257-601	0	0	0	0	0	0	6,100	9,760	0	0	9,760
257-531	0	0	0	0	0	0	0	0	0	0	0
257-601	0	0	0	0	0	0	0	0	0	0	0
East Sulua 257-602	0	0	0	0	0	0	25,000	45,455	0	0	45,455
North Sulua Creek 257-603	0	0	0	0	0	0	24,500	56,334	15,000	21,720	78,054
257-604	0	0	0	0	0	0	0	0	0	0	0
Humpy River 257-701	0	0	0	0	0	0	119,000	224,458	0	0	224,458
Tom's Creek 257-702	0	0	0	0	0	0	13,500	13,500	0	0	13,500
257-703	0	0	0	0	0	0	1,200	1,200	0	0	1,200
Shearwater 258-201	0	0	0	0	50	120	41,000	65,600	1,400	2,100	67,820
North Shearwater Creek 258-202	0	0	0	0	0	0	400	493	400	1,120	1,613
S. Shearwater Creek 258-203	0	0	0	0	0	0	0	0	140	709	709
Dog Bay 258-204	0	0	0	0	0	0	0	0	1,280	1,920	1,920
Coxcomb Pt. Creek 258-205	0	0	0	0	0	0	3,300	4,290	2,500	3,750	8,040
N.Kiliuda 258-206	0	0	0	0	0	0	6,000	8,380	2,400	4,213	12,593
W. Kiliuda Creek 258-207	0	0	0	0	0	0	11,000	13,180	3,060	6,060	19,240
258-208	0	0	0	0	200	480	0	0	1,600	2,400	2,880
258-209	0	0	0	0	0	0	100	247	0	0	247
258-210	0	0	0	0	0	0	0	0	0	0	0

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Appendix E. (page 6 of 13)

Stream Number	Chinook		Sockeye		Coho		Pink		Chum		Total
	Peak Count	Est.Tot. Escape.	Peak Count	Est.Tot. Escape.	Peak Count	Est.Tot. Escape. <sup>a</sup>	Peak Count	Est.Tot. Escape. <sup>b</sup>	Peak Count	Est.Tot. Escape. <sup>c</sup>	Est.Tot. Escape.
Killuda Bay											
258-211	0	0	0	0	0	0	0	0	75	113	113
258-212	0	0	0	0	0	0	0	0	1,100	1,650	1,650
258-213	0	0	0	0	0	0	0	0	0	0	0
McCord's Creek											
258-302	0	0	0	0	0	0	0	0	200	300	300
Ghost Rocks Creek											
258-304	0	0	0	0	0	0	200	400	100	150	550
258-307	0	0	0	0	0	0	0	0	100	150	150
258-309	0	0	0	0	0	0	0	0	0	0	0
258-313	0	0	0	0	0	0	0	0	0	0	0
Ocean Beach											
258-401	0	0	8,100	10,125 <sup>d</sup>	250	600	0	0	0	0	10,725
258-404	0	0	0	0	0	0	0	0	0	0	0
258-426	0	0	0	0	0	0	0	0	0	0	0
Rolling Bay											
258-511	0	0	0	0	0	0	0	0	2,100	4,200	4,200
Natalia Bay											
258-512	0	0	0	0	0	0	0	0	500	1,500	1,500
Newman Bay											
258-513	0	0	0	0	0	0	0	0	350	525	525
Sitkalida											
258-514	0	0	0	0	0	0	0	0	25	100	100
Sitkalida											
258-515	0	0	0	0	0	0	0	0	0	0	0
258-516	0	0	0	0	0	0	0	0	75	113	113
Big Creek											
258-521	0	0	0	0	6,300	15,120	3,400	5,440	1,100	1,650	22,210
Barling Bay											
258-522	0	0	0	0	175	420	12,500	25,107	5,800	9,732	35,259
NE Three Saints											
258-533	0	0	0	0	0	0	0	0	0	0	0
Kaiugnak Point											
258-541	0	0	0	0	0	0	1,800	1,800	0	0	1,800
Kaiugnak											
258-542	0	0	0	0	0	0	11,000	16,772	1,500	1,500	18,272

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Stream Number	Chinook		Sockeye		Coho		Pink		Chum		Total
	Peak Count	Est.Tot. Escape.	Peak Count	Est.Tot. Escape.	Peak Count	Est.Tot. Escape. <sup>a</sup>	Peak Count	Est.Tot. Escape. <sup>b</sup>	Peak Count	Est.Tot. Escape. <sup>c</sup>	Est.Tot. Escape.
Bear Creek 258-544	0	0	0	0	0	0	5,700	5,700	0	0	5,700
Cape Kiavak 258-552	0	0	0	0	0	0	5,360	8,576	0	0	8,576
Knoll Pt. 258-553	0	0	0	0	0	0	850	1,360	0	0	1,360
Kaguyak 258-602	0	0	0	0	0	0	8,800	14,080	8,000	12,000	26,080
Unnamed 258-603	0	0	0	0	0	0	480	768	0	0	768
7-Rivers 258-701	0	0	0	0	0	0	86,400	193,319	0	0	193,319
258-702	0	0	0	0	0	0	8,580	13,728	0	0	13,728
258-853	0	0	0	0	35	84	0	0	0	0	84
258-903	0	0	0	0	0	0	0	0	500	500	500
Monashka Creek 259-101	0	0	0	0	0	0	400	652	0	0	652
Pillar Creek 259-102	0	0	0	0	102	245	1,800	3,300	0	0	3,545
259-103	0	0	0	0	0	0	0	0	0	0	0
259-201	0	0	0	0	0	0	100	160	0	0	160
Buskin River 259-211		0		12,690		10,889		30,392 <sup>b</sup>		79	51,550
Sargent's Creek 259-221	0	0	0	0	24	58	300	480	0	0	538
Russian River 259-222	0	0	0	0	37	89	18,200	29,620	0	0	29,709
Solonie Creek 259-223	0	0	0	0	315	756	5,100	8,160	1,000	3,086	12,002
American River 259-231	0	0	0	0	555	1,332	112,000	163,613	800	1,200	166,145
259-235	0	0	0	0	0	0	200	320	0	0	320
Sid Olds River 259-242	0	0	0	0	3,100	7,440	51,000	84,690	4,500	10,873	103,003
Kalsin Creek 259-243	0	0	0	0	45	108	0	0	255	383	491
259-244	0	0	0	0	0	0	0	0	0	0	0

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Appendix E. (page 8 of 13)

Stream Number	Chinook		Sockeye		Coho		Pink		Chum		Total
	Peak Count	Est.Tot. Escape.	Peak Count	Est.Tot. Escape.	Peak Count	Est.Tot. Escape. <sup>a</sup>	Peak Count	Est.Tot. Escape. <sup>b</sup>	Peak Count	Est.Tot. Escape. <sup>c</sup>	Est.Tot. Escape.
Myrtle Creek											
259-245	0	0	0	0	0	0	14,000	14,000	0	0	14,000
259-246	0	0	0	0	0	0	0	0	0	0	0
Rosalyn Creek											
259-251	0	0	0	0	234	562	12,000	12,500	3	5	13,066
Twin Creek											
259-252	0	0	0	0	0	0	14,900	14,958	0	0	14,958
Capelin Creek											
259-253	0	0	0	0	0	0	4,000	4,000	0	0	4,000
Chiniak Creek											
259-254	0	0	0	0	75	180	9,400	17,378	0	0	17,558
Chiniak Lagoon											
259-255	0	0	0	0	0	0	0	0	0	0	0
Barabara Lake											
259-263	0	0	75	150 <sup>d</sup>	0	0	0	0	0	0	150
259-364	0	0	0	0	0	0	2,100	3,360	0	0	3,360
Kizhuyak River											
259-365	0	0	0	0	150	360	18,000	29,000	8,500	23,660	53,020
259-366	0	0	0	0	0	0	4,700	7,520	0	0	7,520
259-367	0	0	0	0	0	0	1,400	2,240	2,100	2,100	4,340
259-368	0	0	0	0	0	0	50	80	2,050	2,050	2,130
258-369	0	0	0	0	0	0	200	320	0	0	320
Sheratin River											
259-371	0	0	0	0	48	115	15,000	15,057	8,000	9,200	24,372
259-372	0	0	0	0	0	0	8,000	8,000	0	0	8,000
Anton Larson Bay											
259-381	0	0	0	0	0	0	0	0	0	0	0
259-382	0	0	0	0	0	0	3,780	3,880	100	1,700	5,580
259-383	0	0	0	0	0	0	800	1,280	400	600	1,880
Soldier's Bay											
259-391	0	0	0	0	0	0	2,000	3,200	0	0	3,200
Unnamed											
259-393	0	0	0	0	0	0	1,000	1,000	0	0	1,000
Unnamed											
259-394	0	0	0	0	0	0	1,900	3,040	0	0	3,040
Monks Lagoon											
259-395	0	0	0	0	0	0	900	1,440	0	0	1,440

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Appendix E. (page 9 of 13)

Stream Number	Chinook		Sockeye		Coho		Pink		Chum		Total
	Peak Count	Est.Tot. Escape.	Peak Count	Est.Tot. Escape.	Peak Count	Est.Tot. Escape. <sup>a</sup>	Peak Count	Est.Tot. Escape. <sup>b</sup>	Peak Count	Est.Tot. Escape. <sup>c</sup>	Est.Tot. Escape.
Sacramento River 259-401	0	0	0	0	60	144	150	240	0	0	384
Twin Peak Creek 259-402	0	0	0	0	10	24	0	0	0	0	24
Valley Creek 259-403	0	0	0	0	0	0	0	0	0	0	0
Burton's Creek 259-404	0	0	0	0	0	0	0	0	0	0	0
Barry's Lagoon 259-405	0	0	0	0	0	0	0	0	0	0	0
Trail Creek 259-410	0	0	0	0	0	0	12,000	12,763	0	0	12,763
Pasagshak River 259-411	73	73	14,000	17,500 <sup>g</sup>	1,806	4,334	2,000	3,200	0	0	25,107
Miam Creek 259-412	0	0	700	1,400 <sup>d</sup>	2,000	4,800	19,800	49,734	400	600	56,534
Hurst Creek 259-414	0	0	0	0	0	0	11,100	16,840	0	0	16,840
Saltery River 259-415		6		22,705		11,376		39,687	250	375 <sup>e</sup>	74,149
Rough Creek 259-416	0	0	0	0	0	0	0	0	0	0	0
Wild Creek 259-417	0	0	0	0	0	0	0	0	900	1,350	1,350
259-418A	0	0	0	0	0	0	0	0	1,300	1,950	1,950
259-418B	0	0	0	0	0	0	0	0	0	0	0
259-419	0	0	0	0	0	0	200	320	0	0	320
259-419A	0	0	0	0	0	0	0	0	1,100	1,650	1,650
Goat Lake 259-422	0	0	0	0	0	0	630	1,008	50	75	1,083
Killiuda Pass Creek 259-423	0	0	0	0	0	0	1,700	2,720	50	75	2,795
Eagle Harbor 259-424	0	0	0	0	1,200	2,880	11,000	12,500	12,000	15,293	30,673

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Appendix E. (page 10 of 13)

Stream Number	Chinook		Sockeye		Coho		Pink		Chum		Total
	Peak Count	Est.Tot. Escape.	Peak Count	Est.Tot. Escape.	Peak Count	Est.Tot. Escape. <sup>a</sup>	Peak Count	Est.Tot. Escape. <sup>b</sup>	Peak Count	Est.Tot. Escape. <sup>c</sup>	Est.Tot. Escape.
Gull Point Creek											
259-426A	0	0	0	0	25	60	75	120	50	75	255
259-426B	0	0	0	0	50	120	0	0	2,520	6,581	6,701
Unnamed											
259-427	0	0	0	0	0	0	0	0	0	0	0
Unnamed											
262-102	0	0	0	0	0	0	0	0	0	0	0
Unnamed											
262-103	0	0	0	0	0	0	0	0	0	0	0
Unnamed											
262-104	0	0	0	0	0	0	0	0	0	0	0
Unnamed											
262-105	0	0	0	0	0	0	0	0	0	0	0
Unnamed											
262-106	0	0	400	800 <sup>d</sup>	0	0	0	0	0	0	800
Unnamed											
262-107	0	0	0	0	0	0	0	0	0	0	0
Unnamed											
262-108	0	0	0	0	0	0	0	0	0	0	0
Swikshak River											
262-151	0	0	28,000	56,000 <sup>d</sup>	0	0	0	0	4,000	6,400	62,400
Big River											
262-152	0	0	0	0	0	0	22,000	48,000	84,000	102,627	150,627
Village Creek											
262-153	0	0	0	0	0	0	9,000	18,500	4,500	8,303	26,803
Chiniak Beach											
262-154	0	0	0	0	0	0	0	0	5,200	13,200	13,200
262-155	0	0	0	0	0	0	100	160	150	150	310
Ninagiak Creek											
262-202	0	0	0	0	0	0	3,000	4,800	8,000	12,000	16,800
262-202	0	0	0	0	0	0	200	320	900	1,350	1,670
Halo Bay											
262-203	0	0	0	0	0	0	0	0	7,000	10,500	10,500
Halo Creek											
262-204	0	0	0	0	0	0	0	0	1,400	2,100	2,100

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Appendix E. (page 11 of 13)

Stream Number	Chinook		Sockeye		Coho		Pink		Chum		Total
	Peak Count	Est.Tot. Escape.	Peak Count	Est.Tot. Escape.	Peak Count	Est.Tot. Escape. <sup>a</sup>	Peak Count	Est.Tot. Escape. <sup>b</sup>	Peak Count	Est.Tot. Escape. <sup>c</sup>	Est.Tot. Escape.
Cape Chiniak Creek 262-205	0	0	0	0	0	0	3,400	5,780	500	817	6,597
Kukak Beach 262-254	0	0	0	0	0	0	0	0	100	100	100
Kukak River 262-271	0	0	0	0	0	0	1,000	4,000	88,500	88,500	92,500
SW Kukak 262-272	0	0	0	0	0	0	0	0	500	750	750
Kaflia Creek 262-301	0	0	34,100	68,200 <sup>d</sup>	0	0	0	0	0	0	68,200
262-351	0	0	350	700 <sup>d</sup>	0	0	600	8,600	0	0	9,300
W. Missak 262-401	0	0	0	0	0	0	100	1,500	0	0	1,500
Missak Creek 262-402	0	0	0	0	0	0	2,100	2,660	0	0	2,660
Kinak Creek 262-451	0	0	0	0	0	0	6,500	10,167	2,500	5,300	15,467
Geographic Creek 262-501	0	0	0	0	0	0	14,000	22,400	0	0	22,400
262-502	0	0	0	0	0	0	700	6,700	0	0	6,700
Dakavak 262-551	0	0	0	0	0	0	18,000	22,000	10,000	12,000	34,000
262-552	0	0	0	0	0	0	0	0	0	0	0
Alogogshak Creek 262-602	0	0	0	0	0	0	2,000	3,200	11,000	16,500	19,700
262-603	0	0	0	0	0	0	0	0	0	0	0
Kashvik Creek 262-604	0	0	0	0	0	0	63,000	69,000	14,000	23,733	92,733
Kashvik Creek 262-605	0	0	0	0	0	0	700	1,120	100	600	1,720
262-606	0	0	0	0	0	0	0	0	0	0	0
Big Alinchak 262-651	0	0	0	0	0	0	51,000	75,000	50	75	75,075
Little Alinchak 262-652	0	0	0	0	0	0	48,000	68,000	50	75	68,075

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Appendix E. (page 12 of 13)

Stream Number	Chinook		Sockeye		Coho		Pink		Chum		Total
	Peak Count	Est.Tot. Escape.	Peak Count	Est.Tot. Escape.	Peak Count	Est.Tot. Escape. <sup>a</sup>	Peak Count	Est.Tot. Escape. <sup>b</sup>	Peak Count	Est.Tot. Escape. <sup>c</sup>	Est.Tot. Escape.
Alinchak spit 262-653	0	0	0	0	0	0	18,000	43,000	0	0	43,000
Bear Bay 262-654	0	0	0	0	0	0	1,100	29,100	6,200	6,200	35,300
Bear Lake-West 262-655	0	0	0	0	0	0	1,400	19,400	12,000	12,000	31,400
Bear Lake Creek 262-656	0	0	0	0	0	0	600	780	200	320	1,100
262-657	0	0	0	0	0	0	200	200	0	0	200
Helen Creek 262-701	0	0	0	0	0	0	11,000	16,400	0	0	16,400
Portage Creek 262-702	0	0	0	0	0	0	31,000	48,655	500	500	49,155
262-702A	0	0	0	0	0	0	0	0	0	0	0
Unnamed 262-703	0	0	0	0	0	0	16,000	16,000	16,000	16,000	32,000
Trail Creek 262-704	0	0	0	0	0	0	2,000	2,000	11,000	16,500	18,500
Katie Creek 262-705	0	0	0	0	0	0	4,200	4,400	0	0	4,400
262-751	0	0	0	0	0	0	13,000	14,800	15,000	15,000	29,800
Dry Bay 262-752	0	0	0	0	0	0	4,700	4,700	1,000	1,000	5,700
Jute Creek 262-801	0	0	0	0	0	0	2,600	2,600	3,000	3,000	5,600
Kanatak 262-802	0	0	0	0	2,000	2,000 <sup>f</sup>	21,000	29,960	0	0	31,960
262-803	0	0	0	0	0	0	0	0	0	0	0
262-804	0	0	0	0	0	0	0	0	0	0	0
Big Creek 262-851	0	0	0	0	0	0	141,000	206,900	10,000	12,000	218,900
262-851A	0	0	0	0	0	0	1,200	1,200	0	0	1,200
Des Moines Creek 262-852	0	0	0	0	0	0	22,500	32,500	0	0	32,500
Pass Creek 262-853	0	0	0	0	0	0	8,200	9,107	0	0	9,107
262-854	0	0	0	0	0	0	8,600	9,100	100	100	9,200
262-855	0	0	0	0	0	0	0	0	0	0	0

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Appendix E. (page 13 of 13)

Stream Number	Chinook		Sockeye		Coho		Pink		Chum		Total
	Peak Count	Est.Tot. Escape.	Peak Count	Est.Tot. Escape.	Peak Count	Est.Tot. Escape. <sup>a</sup>	Peak Count	Est.Tot. Escape. <sup>b</sup>	Peak Count	Est.Tot. Escape. <sup>c</sup>	Est.Tot. Escape.
Imuya Creek											
262-856	0	0	2	4	0	0	3,200	3,200	8,500	8,500	11,704
262-856A	0	0	0	0	0	0	19,000	30,400	2,000	3,000	33,400
262-856B	0	0	0	0	0	0	100	160	300	800	960
262-856C	0	0	0	0	0	0	0	0	0	0	0
262-857	0	0	0	0	0	0	0	0	0	0	0
Unnamed											
262-858	0	0	0	0	0	0	5,000	9,027	24,600	47,640	56,667
262-859A	0	0	0	0	0	0	4,500	8,233	2,500	2,500	10,733
262-859B	0	0	0	0	0	0	200	293	200	300	593
Totals <sup>i</sup>	23,749	23,749	150,733	1,679,701	104,927	239,669	1,986,717	3,949,598	543,480	882,567	6,775,378

<sup>a</sup> Peak coho surveys expanded by 2.4:1.

<sup>b</sup> Single pink surveys expanded by 1.6:1, multiple surveys applied Johnson and Barrett (1988).

<sup>c</sup> Single chum surveys expanded by 1.5:1, multiple surveys applied Johnson and Barrett (1988).

<sup>d</sup> Peak sockeye surveys expanded by 2.0:1.

<sup>e</sup> Estimate of escapement made by field biologist based on observations of coho in the mouth and lower reaches of the stream.

<sup>f</sup> Aerial survey on 10/09, not expanded to avoid multiple enumeration the same fish; 42,634 of those fish had been counted when the weir was closed on 10/30.

<sup>g</sup> Peak sockeye surveys for shallow clear lakes expanded by 1.25:1 (McCullough, 1989).

<sup>h</sup> Includes and estimated 2,500 fish spawning below the weir.

<sup>i</sup> Totals exclude Frazer Fishpass counts.

Appendix F. Kodiak Management Area salmon return data, 1977 to 1986.<sup>a,b</sup>

		Species (No. of Fish)					Total
		Kings	Sockeye	Coho	Pinks	Chum	
1977	Catch	585	623,486	27,920	6,252,405	1,072,313	7,976,691
	Escapement	13,804	1,270,000	59,095	2,212,448	742,384	4,297,731
	Total Return	14,389	1,893,468	87,015	8,464,853	1,814,697	12,274,422
1978	Catch	3,228	1,071,782	48,795	15,004,065	814,345	16,942,215
	Escapement	14,677	1,000,353	37,479	5,006,273	483,000	6,541,782
	Total Return	17,905	2,072,135	86,274	20,010,338	1,297,345	23,483,997
1979	Catch	1,905	631,735	140,629	11,287,591	358,400	12,420,265
	Escapement	14,445	1,410,800	94,000	3,100,000	607,000	5,226,245
	Total Return	16,350	2,042,535	234,629	14,387,591	965,400	17,646,505
1980	Catch	529	651,394	139,154	17,290,615	1,075,557	19,157,241
	Escapement	5,853	1,831,748	28,000	6,500,000	830,000	9,195,601
	Total Return	6,382	2,483,142	167,154	23,790,615	1,905,557	28,352,850
1981	Catch	1,418	1,288,863	121,544	10,299,749	1,345,318	13,056,893
	Escapement	15,655	1,400,000	59,000	3,200,000	742,000	5,416,655
	Total Return	17,073	2,688,863	180,544	13,499,749	2,087,318	18,473,547
1982	Catch	1,238	1,204,793	343,531	8,076,203	1,266,187	10,891,956
	Escapement	10,773	1,603,692	86,402	5,370,049	1,023,927	8,094,843
	Total Return	12,011	2,808,485	429,933	13,446,252	2,290,114	18,986,795
1983	Catch	3,839	1,231,989	157,618	4,603,371	1,085,165	7,081,985
	Escapement	27,445	1,300,506	104,557	2,089,704	824,954	4,347,166
	Total Return	31,284	2,532,495	262,175	6,693,075	1,910,119	11,429,148
1984	Catch	4,657	1,950,639	229,524	10,844,293	649,092	13,678,206
	Escapement	14,411	1,467,730	123,779	4,512,124	682,936	6,800,980
	Total Return	19,068	3,418,369	353,303	15,356,417	1,332,028	20,479,185
1985	Catch	4,970	1,843,185	284,166	7,334,825	430,757	9,897,901
	Escapement	13,877	2,554,067	191,417	3,204,316	723,390	6,687,067
	Total Return	18,847	4,397,252	475,583	10,539,141	1,154,147	16,584,970
1986	Catch <sup>c</sup>	4,381	3,188,269	168,673	11,808,275	1,134,558	16,304,150
	Escapement	11,050	2,001,279	168,780	4,068,615	655,817	6,905,541
	Total Return	15,431	5,189,548	337,453	15,876,890	1,790,375	23,209,697
Ten Year Average Catch		2,675	1,368,614	166,155	10,280,139	923,169	12,740,752
Ten Year Average Return		16,874	2,954,676	260,265	14,202,880	1,655,159	19,089,854

<sup>a</sup> Source, Manthey (1986).

<sup>b</sup> Escapement estimates determined by summation of peak aerial and foot surveys of index streams combined with escapements enumerated at weirs.

<sup>c</sup> Data based on 1986 fish ticket run.

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