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Kodiak Management Area Salmon Catch and Escapement Statistics, 1986

by

Patrick B. Holmes

State of Alaska

Steve Cowper, Governor

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ABSTRACT

Salmon catch and escapement statistics, age, sex, and size data have been summarized for the Kodiak Management Area for the 1986 season. A total of 478 permit holders made 18,199 landings, for a commercial salmon harvest of 16,303,216 fish, 32% higher than the 1976-85 average harvest (12,366,481 fish). The species composition of the catch was 4,381 chinook (*Oncorhynchus tshawytscha*), 3,188,046 sockeye (*O. nerka*), 168,690 coho (*O. kisutch*), 11,807,727 pink (*O. gorbuscha*), and 1,134,372 chum (*O. keta*) salmon. The sockeye catch was nearly twice (178%) the 1985 harvest. The estimated escapement of 9,418,422 fish included 11,050 chinook, 2,159,495 sockeye, 294,041 coho, 5,787,975 pink, and 1,165,861 chum salmon. Nearly 80% of the 1986 run of 25,729,693 salmon originated from systems on the west and south side of Kodiak Island. Chinook salmon from two escapement samples were primarily age 1.3 (44%), with an average length of 870 mm, and a 1.0 : 1 male to female ratio. Sockeye salmon in the catch were mainly 5 (66%) and 6 (19%) years of age, with an average length of 549 mm, and a 0.9 : 1 male to female ratio. Sockeye salmon in the escapement were predominantly 5 (52%) and 6 (27%) years of age, with an average length of 547 mm, and a 1.1 : 1 male to female ratio. Coho salmon from three catch samples were primarily ages 1.1 (36%) and 2.1 (59%), with a mean length of 623 mm, and a 0.8 : 1 male to female ratio. Coho salmon in the escapement were primarily ages 1.1 (22%) and 2.1 (56%), with a mean length of 642 mm, and a male to female ratio of 1.6 : 1. Chum salmon from three catch samples were primarily age 0.3 (77%), with a mean length of 620 mm, and a 0.7 : 1 male to female ratio.

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

INTRODUCTION

The 1986 salmon catch and escapement data for the Kodiak Management Area summarized in this report will, when combined with other years, provide for the future evaluation of salmon stocks, including the development of brood tables, refinement of escapement goals, and forecasting future runs. The full data set is presented without analysis or interpretation in Holmes (1988); those needing more specific data may find that report useful.

The Kodiak Management Area encompasses the area on the southern Alaska Peninsula from Cape Douglas to the southern entrance ofImuya Bay near Kilokak Rocks, including the Kodiak Archipelago. The area is divided into 9 districts, 17 sections, and 98 statistical reporting areas (Figures 1 and 2; ADF&G 1986). During 1986, salmon escapements were monitored in 219 of the area's 636 designated anadromous systems (ADF&G 1985).

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 1986; 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*).

Management of Kodiak's major fisheries is complicated by overlapping species run timing. Pink and chum salmon begin to overlap the early sockeye runs by July 6, while coho salmon overlap the late sockeye runs around mid August.

There are no directed chinook fisheries in the management area. Chinook harvests occur incidentally to the early run sockeye fisheries. Karluk River and Red (Ayakulik) River are the only systems with large chinook escapements.

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 systems to these fisheries (Manthey 1986; Figure 3). A major sockeye interception fishery occurs in the Cape Igvak Section of the Mainland District. Historic tagging data indicates 80% of the sockeye harvested from this fishery were of Chignik River origin (ADF&G 1986; Lechner 1969). Terminal and limited local interception fisheries also occur on stocks originating from: Pauls, Afognak, Barabara, Uganik, Little River, Akalura, Horse Marine, Silver Salmon, Saltery, Kaflia Lakes, Swikshak River, and Ocean Beach Creek.

The majority of the coho harvest occurs in the Afognak, Mainland, and Red River Districts. The largest coho escapements usually occur in the Karluk, Red (Ayakulik), and Afognak Rivers.

Pink salmon fisheries occur throughout the management area. Much of the harvest is taken in non-terminal cape fisheries. The largest catch usually occurs in the Uganik and Uyak Bay Districts, and the largest escapements occur at Karluk and Red Rivers.

The largest chum harvests occur in the Mainland, Uganik Bay and Uyak Bay Districts, while the largest chum escapements occur in the Spiridon, Sturgeon and Kizhuyak Rivers.

METHODS

Catch Enumeration

The catch data presented in this report were compiled by statistical week from individual fish ticket sales receipts for fish sold to the processors, by the Division of Commercial Fisheries, Alaska Department of Fish and Game. 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 1986 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 1988). Data in this report may differ slightly from earlier publications because of more recent editing.

Chinook, Coho, Pink, and Chum Catch Assignment

Chinook, coho, pink, and chum catches were assigned to broad geographic areas based on traditional fishing patterns and distribution of tenders (Table 1). This method of catch assignment was based on a lack of tagging information for these species combined with a management program which encourages that much of the harvest of these species is taken in non-terminal cape fisheries.

Sockeye Catch Assignment

Sockeye catches were assigned to the major systems based on tagging data and unpublished estimates of the timing and distribution of specific stocks from the Kodiak Area Management Biologist (Table 2). 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, from the Southwest Afognak Section to the Cape Alitak Section. 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. Catches were assigned to Pauls, Afognak, Uganik, Saltery, Buskin and Kaflia Lakes from the terminal harvests areas defined by the Kodiak Area Management Biologist (K. Manthey, ADF&G, Kodiak, personal communication).

Tag recoveries at the stream of origin were used to determine the major stock's early run composition in each fishery. 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 1986. An example of this weighting procedure is presented in Barrett (1988). The compositions of the late runs to Karluk River, Red River, and Upper Station were calculated by weighting the adjusted percentage composition of the early run stocks for variations in the

individual strength of each run as gauged by escapement strengths. The percentages used to estimate the composition of each stock and run are presented by fishery in Table 3, and by stock in Table 4.

The catch by stock in each fishery was calculated for each statistical week and area by multiplying the percentage composition for each stock by the weekly catch for each respective statistical area. Each week 100% of the catch was assigned to the contributing systems of origin (Table 3).

Escapement Enumeration

Salmon escapements at Karluk, Red, Buskin, and Saltery Rivers, and Upper Station, Frazer, Afognak, 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 (Table 5; Appendix C; Murray 1987).

Many of the aerial stream surveys were flown with the primary objective of enumerating 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. A 2.0:1 expansion factor was applied to the peak sockeye escapement counts (Barrett et al. 1984). A 2.4:1 expansion factor, based on data presented by Minard (1986), was applied to coho escapement estimates. Pink and chum total escapements were estimated using the methodology 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 1.8:1 for pink salmon and 1.7:1 for chum salmon based on the ratio of peak counts to total escapement for each species calculated by the Johnson and Barrett model.

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, and 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 major spawning period. In-season surveys covered only the lower main stem of the streams, while the post-season spawning surveys included the entire stream reach. The Shuyak and Afognak Island surveys assessed in-season buildup and initial escapements in the lower reaches of the streams.

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 fishery. This was the first year that the total salmon run was calculated based

on estimated total escapements, and differs from the method used by Manthey (1986).

Catch and Escapement Sampling

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

Sample Sizes

B.A. Johnson (Alaska Department of Fish and Game, Kodiak, personal communication) devised catch and escapement sample sizes based on Thompson (1987). Sample sizes were adjusted for a typical age class composition scenario for each species. A single sockeye sample of 600 fish was estimated to provide 95% simultaneous confidence levels for age composition within $\pm$ 5% of the true age composition. An alternative sample level of 480 sockeye salmon was used when the sampling goal of 600 could not be achieved. The 480-fish sample size assured at least a 90% confidence level for age composition with $\pm$ 5% of true composition for each age class. A coho sample of 280 fish (2 scales per fish) and a sockeye escapement sample of 240 fish were chosen because of logistic difficulties. These samples were estimated to provide 90% simultaneous confidence levels for age composition within $\pm$ 7% of the true age composition. A chum catch sample of 240 fish was taken to provide data for establishing an appropriate sample size in 1987.

Catch Sampling

Weekly commercial catch samples of 480 to 600 sockeye 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, and on the fishing grounds by the ADF&G crew on the M/V *Coho* (Figure 3). The fishing areas sampled and the types of fishing gear used at each location are listed in Appendix D.

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 the tender operator.

Escapement Sampling

Usually a weekly sample of 240 sockeye salmon was collected within a 48-h sampling period at the following weirs: Frazer Lake fishpass, Upper Station, Red River, and Karluk River. A single sample of approximately 600 fish was taken by beach seine from each of the following lakes: Afognak, Buskin, Saltery, Uganik,

Little River, and Kaflia. One sockeye sample of 67 fish was also taken with a seine at Horse Marine Lagoon. A single coho sample of about 280 fish was collected at each of the following locations: Upper Station Lake, Karluk, and Saltery River weirs. A combined weir and seine sample of 411 coho salmon was taken at the Buskin River. Coho samples of less than 140 fish were collected at each of the following sites: Afognak River, Akalura Lagoon, and Dog Salmon Creek. The single samples of sockeye and coho salmon were timed to best reflect the respective escapements. Chinook samples of 15 fish at Karluk River and 35 fish at Red River were taken by hook and line.

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 utilizing a standard microfiche viewer. Ages were recorded using European notation (e.g., 1.3). In this notation the first digit is the number of freshwater annuli, while 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 two 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 1986 harvest of 16,499,287 salmon included a commercial harvest of 16,303,216 fish, a sport catch of 41,466 fish, and a subsistence harvest of 154,605 fish.

The 1986 commercial salmon catch for the management area was 32% higher than the 1976-85 average of 12,366,481 fish. The species composition was 4,381 chinook, 3,188,046 sockeye, 168,690 coho, 11,807,727 pink, and 1,134,372 chum salmon (Tables 6 and 7). The major component of the improved catch was sockeye salmon, which was 186% higher than the 1976-85 average of 1,113,925 fish.

A total of 478 limited entry permit holders made 18,199 landings (Table 2). Purse seines were used by 288 permit holders to make 11,051 landings. Beach seines were used by 15 permit holders to make 286 landings. Set gill nets were used by 175 permit holders to make 6,862 landings. Specific catch and effort data are summarized by gear type, statistical week and area in Holmes (1988) .

The estimated escapement for 1986 was 9,418,422 salmon, which included: 11,050 chinook, 2,159,495 sockeye, 294,041 coho, 5,787,975 pink, and 1,165,861 chum salmon (Table 8 and Appendix C). Escapement data are summarized by stream of origin in Appendix E, Holmes (1988), and Murray (1986).

The estimated salmon run of Kodiak Management Area origin was 25,729,693 fish (Tables 1, 2, and 8). The species composition was 16,011 chinook, 5,309,235 sockeye, 490,691 coho, 17,612,582 pink, and 2,301,174 chum salmon. Approximately 80% of these fish originated from systems on the west and south sides of Kodiak Island. Previous 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. Total runs for 1977 to 1986 are presented by species in Appendix E; although these estimates were derived by a different method, they are useful to examine for trends in annual salmon runs (Manthey 1986).

Chinook Salmon

The estimated total harvest of 4,961 chinook salmon included a commercial catch of 4,381 fish, a sport catch of 489 fish (Mills 1987), and a subsistence harvest of 91 fish.

The commercial catch was 86% higher that the 1976-85 average of 2,314 (Table 6). This high catch resulted from increased fishing time for the sockeye fisheries which incidentally harvest chinook salmon (Manthey 1986). Nearly 93% of the chinook harvest (4,090 fish) occurred in the Kodiak Archipelago. The largest catch (1,895 fish) was taken in the Red River District (Table 7).

Purse seines harvested approximately 93% of the commercial chinook catch (4,042 fish; Table 7). Less than 1% of the catch (21 fish) was taken with beach seine gear. Set gill net gear harvested 7% of the total chinook catch (318 fish).

The total chinook escapement of 11,050 fish was 11% less than the 1976-85 average escapement of 12,461 salmon (Manthey 1986); nearly 98% (10,800 fish) of the escapement entered the Karluk and Red (Ayakulik) Rivers. Small numbers escaped to Frazer Lake (211 fish) and Lake Rose Tead (25 fish; Table 5; Appendix C).

The estimated total chinook run was 16,011 fish. This estimate included a total harvest of 4,961 fish and an escapement of 11,050 fish (Table 8).

The limited number of chinook sampled from Karluk and Red (Ayakulik) River, were primarily age 1.3 (44%), and 1.4 (28%) (Table 9). The mean length of these fish was 820 mm at the Karluk River and 891 mm at Red River (Table 10). The male to female ratio was 0.6:1 at Karluk River and 1.1:1 at Red River.

Sockeye Salmon

The estimated total sockeye harvest of 3,337,756 fish included a commercial catch of 3,188,046 fish, a sport catch of 5,259 fish (Mills 1987), and a subsistence harvest of 144,451 fish (Table 8).

This 1986 commercial catch was the largest since 1917 and was 182% higher than the 1976-85 average of 1,113,925 fish (Table 6). Nearly 94% of the catch (3,000,030 fish) was of Kodiak Management Area origin; the balance of harvest, 188,016 fish from the Cape Igvak Section, were Chignik River stocks. Fisheries in the Uganik Bay, Uyak Bay, Karluk, Red River, and Alitak Bay Districts, and the Cape Igvak Section of the Mainland District produced 84% of the area harvest. The Alitak Bay District accounted for 39% of the total commercial catch (Table 7).

Purse seine gear harvested nearly 63% of the sockeye catch (2,010,299 fish), beach seines took less than 1% (5,279 fish), and set gill net gear caught 36% (1,175,758 fish; Table 7).

The estimated total sockeye escapement was 2,159,495 fish (Table 2). The majority of the escapement (77%) occurred into three systems: Karluk River, 887,691 fish; Red River, 318,135 fish; Upper Station, 468,085 fish. Escapements into weired systems, with the exception of Upper Station, were lower than in 1985. Minimum escapement goals were achieved at Karluk and Red Rivers; however, they were not reached at Frazer Lake, and they were exceeded at Upper Station (Manthey 1986).

The estimated total sockeye run of Kodiak Management Area origin was 5,309,235 fish, including a total harvest of 3,149,740 fish and an estimated escapement of 2,159,495 fish (Tables 2 and 8). The Karluk River, Red (Ayakulik) River, and Upper Station Lakes produced the majority (86%) of the run.

The majority of the sockeye catch sampled during 1986 was comprised of 5- (66.2%) and 6-year-old (19.2%) fish. The 5-year-olds were mainly age 2.2, and the 6-year-olds were predominantly age 2.3. Sockeye salmon in the Cape Igvak Section

harvest, prior to July 20, were primarily 5- (59.7%) and 6-year-old (25.5%) fish (Table 11).

Kodiak Management Area sockeye escapements were mainly 5- (51.8%) and 6-year-old (26.7%) fish. The 5-year-old fish were mainly age 2.2, and the 6-year-old fish were primarily age 2.3 (Table 12).

The total sockeye run was predominantly 4- (23.8%) and 5- (50.4%) year old fish; the 4-year-old fish were primarily age 1.2 and the 5-year-old fish were mainly age 2.2 (Table 12).

The mean length of sockeye sampled from all catches, excluding the Cape Igvak Section, was 549 mm. The Uganik Bay District sockeye with a mean length of 563 mm were the largest fish in the sampled catch (Table 13). The mean length of sockeye salmon in the sampled escapements was 547 mm, with mean lengths ranging from 510 mm in the early run at Upper Station to 570 mm at Saltery Lake (Table 14).

The male to female ratio of the sampled sockeye catch was 0.9:1, with a range of 0.4:1 at Cape Igvak to 1.1:1 in Uganik Bay (Table 13). The mean sockeye sex composition of the monitored escapements (excluding a small sample from Horse Marine Lake) was 1.1:1, with a range from 0.6:1 at Saltery Lake to 1.7:1 at Little River escapement (Table 14).

Coho Salmon

The estimated total coho harvest of 196,650 fish included a commercial catch of 168,690 fish, a sport catch of 20,873 fish (Mills 1987), and a subsistence harvest 7,087 fish (Table 8).

The commercial catch was 11% higher than the 1976-85 average (151,660 fish), but was 41% less then the record 1985 harvest of 284,166 fish (Table 6). The reduced harvest was attributed to weak coho escapements in the Afognak District and restricted fisheries on the south and west sides of Kodiak Island (Manthey 1986). The majority (92%) of the catch occurred in the Kodiak Archipelago. The Uyak District produced the largest catch (35,398 fish; Table 7). The largest terminal harvest (13,575 fish) occurred in the Ayakulik Section of the Red River District.

Purse seine gear harvested nearly 80% of the commercial coho catch (134,524 fish), beach seines took approximately 1% (1,744 fish), and set gill net gear caught 19% (32,422 fish; Table 7).

The estimated total coho escapement was 294,041 fish (Table 8, Appendix C). Only 30% of the coho escapement (90,498 fish) was enumerated at ten weirs (Table 5). The balance was projected for the numerous small systems monitored by aerial and foot surveys (Table 1; Appendix C). The largest coho escapements occurred at: stream 251-602 on Shuyak Island (1,920 fish), the Karluk River on Kodiak Island (24,565 fish), the Buskin River on the Kodiak road system (9,492 fish, and Swikshak Lagoon on the Alaska Peninsula (54,000 estimated coho escapement).

The estimated total coho run of 490,691 fish, included a total harvest of 196,650 fish, and an estimated total escapement of 294,041 fish (Tables 1 and 8).

Coho catch samples were collected from three terminal fishing areas: Discoverer Bay on Afognak Island, Zachar Bay on Kodiak Island, and Swikshak Beach on the Alaska Peninsula (Table 15). Fish in these samples were primarily ages 2.1 (59.4%) and 1.1 (35.7%). The mean length of the sampled fish was 622 mm at Discoverer Bay, and 664 mm at Swikshak Beach (Table 16). The male to female ratio of the samples was 0.7:1 at Swikshak Beach and 1.0:1 at Discoverer Bay (Table 16).

The sampled coho escapements were primarily age 1.1 (21.5%), age 2.1 (55.5%) and age 3.1 (22.4%) fish. The majority of the age 3.1 (92.7%) fish were in the Karluk River (Table 17). The mean length of the sampled coho escapements was 642 mm; mean lengths ranged from 625 mm at Saltery River to 656 mm at Buskin Lake (Table 18). Male to female ratios ranged from 0.9:1 at Upper Station to 2.1:1 at the Karluk River.

Pink Salmon

The estimated total pink harvest of 11,824,607 fish included a commercial pink catch of 11,824,607 salmon, a sport catch of 14,509 fish (Mills 1987), and a subsistence harvest of 2,371 fish (Table 8).

The commercial catch decreased 5% from the 1976-84 even-year average harvest 11,807,727 fish (Table 6), and was nearly 3.2 million fish less than the mid-point harvest forecast. The lower than expected catch resulted primarily from a weak run to the Karluk River (Manthey 1986). The catch was 27% lower than the 1984 catch. The majority (93%) of the pink harvest (11,001,399 fish) occurred in the Kodiak Island Archipelago. The Uganik Bay District produced the largest catch, 4,244,772 fish (Table 7).

Purse seine gear harvested nearly 81% of the commercial pink catch (9.579,868 fish), beach seines took less than 2% (172,968 fish), and set gill net gear caught 17% (2,054,873 fish; Table 7).

The estimated total pink escapement was 5,787,975 fish. The largest escapements occurred at Karluk River (668,298 fish), and at Red River (560,210 fish; Table 5, Appendix C).

The estimated total pink run of 17,612,582 fish included a total harvest of 11,824,607 fish, and an estimated total escapement of 5,787,975 fish (Tables 1 and 8).

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

Chum Salmon

The estimated total chum harvest of 1,135,313 fish included a commercial catch of 1,134,372 fish, a sport catch of 336 fish (Mills 1987) and a subsistence harvest of 605 fish (Table 8).

The commercial catch increased nearly 163% over the 1985 harvest (430,757 fish) and was 28% above the 1976-85 average catch of 883,764 fish (Table 6). This

harvest was close to the preseason forecast of 1,000,000 fish. The improved catch was attributed to strong runs (Manthey 1986). The majority (65%) of the chum harvest (733,903 fish) occurred in the Kodiak Archipelago. The largest total catch (400,469 fish) occurred in the Mainland District (Table 7).

Purse seine gear harvested nearly 86% of the commercial chum catch (972,207 fish), beach seines took approximately 4% (5,691 fish), and set gill net gear caught 14% (156,474 fish; Table 7).

The estimated total chum escapement was 1,165,861 fish. The Spirodon, Sturgeon, and Kizhuyak Rivers produced nearly 41% (474,758 fish) of the estimated total chum escapement (Table 1 and Appendix C).

The estimated total chum run was 2,301,174 fish which included a total catch of 1,135,313 fish and an estimated total escapement of 1,165,861 fish (Tables 1 and 8).

Chum catch samples were collected from three terminal fishing areas: Zachar Bay and Salua-Portage Bay on Kodiak Island, and Kukak Bay on the Alaska Peninsula. The fish in these samples were primarily age 0.3 (76.6%) (Table 19). Mean lengths of sampled fish ranged from 613 mm at Zachar Bay to 628 mm at Kukak Bay. The overall mean was 620 mm (Table 20). The male to female ratios were 0.3:1 at Zachar Bay to 1.5:1 at Salua-Portage Bay.

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Table 1. Estimated chinook, coho, pink, and chum salmon escapement, catch, and run numbers by area, for the Kodiak Management Area, 1986.

Geographic Area	Number of Fish				
	Chinook	Coho	Pink	Chum	Total
Afognak District					
Total Est. Escapement	0	45,242	783,370	4,776	833,388
Commmercial Catch	140	16,412	1,203,143	35,660	1,255,355
Run	140	61,654	1,986,513	40,436	2,088,743
West side[a]					
Total Est. Escapement	10,800	75,444	2,719,367	377,331	3,182,942
Commmercial Catch	3,561	93,424	8,422,017	532,067	9,051,069
Run	14,361	168,868	11,141,384	909,398	12,234,011
Alitak District					
Total Est. Escapement	222	13,481	483,795	35,792	533,290
Commmercial Catch	143	30,786	773,224	75,866	880,019
Run	365	44,267	1,257,019	111,658	1,413,309
General District					
Total Est. Escapement	28	97,474	1,083,033	346,531	1,527,066
Commmercial Catch	246	15,001	603,015	90,310	708,572
Run	274	112,475	1,686,048	436,841	2,235,638
Mainland District					
Total Est. Escapement	0	62,400	718,409	401,432	1,182,241
Commmercial Catch	291	13,067	806,328	400,469	1,220,155
Run	291	75,467	1,524,737	801,901	2,402,396
MANAGEMENT AREA TOTALS:					
Total Est. Escapement	11,050	294,041	5,787,975	1,165,861	7,258,927
Commmercial Catch	4,381	168,690	11,807,727	1,134,372	13,115,170
Sport Catch[b]	489	20,873	14,509	336	36,207
Subsistence Catch[c]	91	7,087	2,371	605	24,605
Run	16,011	490,691	17,612,582	2,301,174	20,434,909

[a] West side includes the Uganik Bay, Uyak Bay, Karluk, Sturgeon River, and Red River Districts.
[b] M. Mills (1987).
[c] L. Malloy, ADF&G, Kodiak, personnal communication.

Table 2. Sockeye salmon catch, escapement, and run numbers, by system, in the Kodiak Management Area, 1986.

System	Assigned Catch	Escapement	Run
Thorshiem Creek	[a]	6,383	6,383
Afognak Lake	8,371	48,333	56,704
Pauls Lake	[a]	5,402	5,402
Little River	[a]	18,000[b]	18,000
Uganik Lake	37,907	90,000[b]	127,907
Karluk Lake, early run	373,898	359,123	733,021
late run	352,802	528,048	880,850
Red River, early run	259,806	265,567	525,373
late run	74,086	52,568	126,654
Akalura Lake, early run	[a]	3,640[b]	3,640
late run		9,792	9,792
Upper Station, early run	143,447	99,965	243,412
late run	1,534,916	368,120	1,903,036
Horse Marine Lake	[a]	4,000[b]	4,000
Frazer Lake	38,563	126,529	165,092
Buskin Lake	8,022	8,939	16,961
Saltery Lake	18,717	38,314	57,031
Kaflia Lake	5,093	24,000[b]	29,093
Other	144,402	102,772	247,174
Subtotal	3,000,030	2,159,495	5,159,525
Sport	5,259[c]		
Subsistence	144,451[d]		
TOTAL	3,149,740[e]	2,159,495	5,309,235

[a]Catch data not available.
[b]Estimate based on expansion of peak aerial survey by 2.0:1 (Barrett al. 1984).
[c]M. Mills (1987).
[d]L. Malloy, ADF&G, Kodiak, personnal communication.
[e] Excludes 188,016 Chignik River sockeye salmon harvested in the Cape Igvak Section.

Table 3. Sockeye salmon stock composition and lag time used to assign commercial catches to system of origin in the Kodiak Management Area, 1986.

DISTRICT	SECTION	STATISTICAL AREA	CATCH WEEKS	LAG TIME	PERCENT COMPOSITION	STOCK	SOURCE
Afognak	Southwest Afognak	251-10,20	24-27	1	90.7	Karluk River, early run	Tyler, et al. (1986)[a]
		251-10,20	24-27	1	2.8	Red River, early run	Tyler, et al. (1986)[a]
		251-10,20	24-27	2	3.3	Upper Station, early run	Tyler, et al. (1986)[a]
		251-10,20	24-27	2	3.2	Frazer Lake	Tyler, et al. (1986)[a]
		251-10,20	28-29	1	54.6	Karluk River, early run	Tyler, et al. (1986)[a]
		251-10,20	28	1	1.6	Red River, early run	Tyler, et al. (1986)[a]
		251-10,20	30-39	2	54.6	Karluk River, late run	Tyler, et al. (1986)[a]
		251-10,20	29-39	1	1.6	Red River, late run	Tyler, et al. (1986)[a]
		251-10,20	28-39	2	43.8	Upper Station, late run	Tyler, et al. (1986)[a]
	North Afognak	251-82,83	24-28	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	90.8	Karluk River, early run	Tyler, et al. (1986)[a]
			24-27	1	2.8	Red River, early run	Tyler, et al. (1986)[a]
			24-27	2	2.6	Upper Station, early run	Tyler, et al. (1986)[a]
			24-27	2	3.8	Frazer Lake	Tyler, et al. (1986)[a]
			28-29	1	60.3	Karluk River, early run	Tyler, et al. (1986)[a]
			28	1	1.7	Red River, early run	Tyler, et al. (1986)[a]
			30-39	2	60.3	Karluk River, late run	Tyler, et al. (1986)[a]
			29-39	1	1.7	Red River, late run	Tyler, et al. (1986)[a]
			28-39	2	38.0	Upper Station, late run	Tyler, et al. (1986)[a]
		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			
		253-13	24-29	0	60.0	Uganik Lake	Manthey, pers com
			24-29	1	40.0	Karluk Early Run	Manthey, pers com

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Table 3. (page 2 of 4)

DISTRICT	SECTION	STATISTICAL AREA	CATCH WEEKS	LAG TIME	PERCENT COMPOSITION	STOCK	SOURCE
Uganik Bay (continued)			30-39	2	60.3	Karluk River, late run	Tyler, et al. (1986)[a]
			30-39	1	1.7	Red River, late run	Tyler, et al. (1986)[a]
			30-39	2	38.0	Upper Station, late run	Tyler, et al. (1986)[a]
Uyak Bay[b]		254-10,20,30,40					
			24-27	1	90.8	Karluk River, early run	Tyler, et al. (1986)[a]
			24-27	1	2.8	Red River, early run	Tyler, et al. (1986)[a]
			24-27	2	2.6	Upper Station, early run	Tyler, et al. (1986)[a]
			24-27	2	3.8	Frazer Lake	Tyler, et al. (1986)[a]
			28-29	1	60.3	Karluk River, early run	Tyler, et al. (1986)[a]
			28	1	1.7	Red River, early run	Tyler, et al. (1986)[a]
			30-39	2	60.3	Karluk River, late run	Tyler, et al. (1986)[a]
			29-39	1	1.7	Red River, late run	Tyler, et al. (1986)[a]
			28-39	2	38.0	Upper Station, late run	Tyler, et al. (1986)[a]
Karluk[c]		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	0	90.8	Karluk River, early run	Tyler, et al. (1986)[a]
			24-27	1	2.8	Red River, early run	Tyler, et al. (1986)[a]
			24-27	2	2.6	Upper Station, early run	Tyler, et al. (1986)[a]
			24-27	2	3.8	Frazer Lake	Tyler, et al. (1986)[a]
			28-30	0	60.3	Karluk River, early run	Tyler, et al. (1986)[a]
			28	1	1.7	Red River, early run	Tyler, et al. (1986)[a]
			31-39	1	60.3	Karluk River, late run	Tyler, et al. (1986)[a]
			29-39	1	1.7	Red River, late run	Tyler, et al. (1986)[a]
			28-39	2	38.0	Upper Station, late run	Tyler, et al. (1986)[a]
Sturgeon River		256-30,40	24-27	0	65.3	Red River, early run	Tyler, et al. (1986)[a]
			24-27	2	32.6	Upper Station, early run	Tyler, et al. (1986)[a]
			24-27	2	2.1	Frazer Lake	Tyler, et al. (1986)[a]
			28-29	0	7.8	Red River, early run	Tyler, et al. (1986)[a]
			30-39	0	7.8	Red River, late run	Tyler, et al. (1986)[a]
			28-39	2	92.2	Upper Station, late run	Tyler, et al. (1986)[a]

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Table 3. (page 3 of 4)

DISTRICT	SECTION	STATISTICAL AREA	CATCH WEEKS	LAG TIME	PERCENT COMPOSITION	STOCK	SOURCE
Red River	Ayakulik	256-10,20	24-27	1	1.0	Karluk, early run	Tyler, et al. (1986)[a]
			24-27	0	91.5	Red River, early run	Tyler, et al. (1986)[a]
			24-27	1	4.9	Upper Station, early run	Tyler, et al. (1986)[a]
			24-27	2	2.6	Frazer Lake	Tyler, et al. (1986)[a]
			28-29	1	0.5	Karluk, early run	Tyler, et al. (1986)[a]
			28-29	0	43.9	Red River, early run	Tyler, et al. (1986)[a]
			28	1	55.6	Upper Station, early run	Tyler, et al. (1986)[a]
			30-39	2	0.1	Karluk, late run	Tyler, et al. (1986)[a]
			30-39	0	43.9	Red River, late run	Tyler, et al. (1986)[a]
			29-39	1	55.6	Upper Station, late run	Tyler, et al. (1986)[a]
	Gurney Bay	256-25	24-27	0	65.5	Red River, early run	Tyler, et al. (1986)[a]
			24-27	1	15.2	Upper Station, early run	Tyler, et al. (1986)[a]
			24-27	2	19.3	Frazer Lake	Tyler, et al. (1986)[a]
			28-29	0	15.4	Red River, early run	Tyler, et al. (1986)[a]
			28	1	84.6	Upper Station, early run	Tyler, et al. (1986)[a]
			30-39	0	15.4	Red River, late run	Tyler, et al. (1986)[a]
			29-39	1	84.6	Upper Station, late run	Tyler, et al. (1986)[a]
Alitak	Cape Alitak	257-10,20	24-27	0	8.5	Red River, early run	Tyler, et al. (1986)[a]
			24-27	1	23.5	Upper Station, early run	Tyler, et al. (1986)[a]
			24-27	2	68.0	Frazer Lake	Tyler, et al. (1986)[a]
			28-29	0	1.5	Red River, early run	Tyler, et al. (1986)[a]
			28	1	98.5	Upper Station, early run	Tyler, et al. (1986)[a]
			30-39	0	1.5	Red River, late run	Tyler, et al. (1986)[a]
			29-39	1	98.5	Upper Station, late run	Tyler, et al. (1986)[a]
	Upper Olga S.A.	257-30	24-29	0	95.0	Upper Station, early run	Manthey, pers comm
			24-29	0	5.0	Other	Manthey, pers comm
			30-39	0	95.0	Upper Station, late run	Manthey, pers comm
			30-39	0	5.0	Other	Manthey, pers comm

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Table 3. (page 4 of 4)

DISTRICT	SECTION	STATISTICAL AREA	CATCH WEEKS	LAG TIME	PERCENT COMPOSITION	STOCK	SOURCE
	Moser/Olga Bay	257-40 (Lower Olga Bay)	24-28	0	58.3	Frazer Lake	Barrett, BM, 1988
			24-28	0	36.5	Upper Station, early run	Barrett, BM, 1988
			24-28	0	5.2	Other	Barrett, BM, 1988
			29-39	0	95.0	Upper Station, late run	Barrett, BM, 1988
			29-39	0	5.0	Other	Barrett, BM, 1988
		257-41 (Moser Bay)	24-28	1	52.2	Frazer Lake	Barrett, BM, 1988
			24-28	0	44.4	Upper Station, early run	Barrett, BM, 1988
			24-28	0	3.4	Other	Barrett, BM, 1988
			29	0	95.0	Upper Station, early run	Barrett, BM, 1988
			29	0	5.0	Other	Barrett, BM, 1988
			30-39	0	95.0	Upper Station, late run	Barrett, BM, 1988
			30-39	0	5.0	Other	Barrett, BM, 1988
	Deadman/Portage[c]	257-50,60,70	24-27	0	8.5	Red River, early run	Tyler, et al. (1986)[a]
			24-27	1	23.5	Upper Station, early run	Tyler, et al. (1986)[a]
			24-27	2	68.0	Frazer Lake	Tyler, et al. (1986)[a]
			28-29	0	1.5	Red River, early run	Tyler, et al. (1986)[a]
			28	1	98.5	Upper Station, early run	Tyler, et al. (1986)[a]
			30-39	0	1.5	Red River, late run	Tyler, et al. (1986)[a]
			29-39	1	98.5	Upper Station, late run	Tyler, et al. (1986)[a]
General	Chiniak	259-21,22	24-39	0	100.0	Buskin River	Terminal Fishery
	Ugak	259-41,42	24-39	0	100.0	Saltery Lake	Terminal Fishery
Mainland	Kukak	262-30	24-39	0	100.0	Kafflia Lakes	Terminal Fishery

[a]Tag recovery data weighed to the 1981 and 1986 escapements.
[b]Includes that portion of the Karluk District (stat area 254-10) north of Rocky Point.
[c]Includes that portion of the Karluk District south of Rocky Point.

Table 4. Sockeye salmon catch composition by stock in the Kodiak Management Area, 1986.

Stock	District	Section	Area	Weeks	Migration Time To Nearest Week	Percentage Of Catch	Source
Pauls Lake	Afognak	North Afognak	251-82,83	24-28	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	90.7	Tyler, et al., 1986[a]
				28-29	1	54.6	Tyler, et al., 1986[a]
	Uganik Bay		253-11,14,31,32,33,35				
				24-27	1	90.8	Tyler, et al., 1986[a]
				28-29	1	60.3	Tyler, et al., 1986[a]
			253-12	24-26	1	40.0	Manthey, pers com
			253-13	24-29	1	40.0	Manthey, pers com
	Uyak Bay[b]		254-10,20,30,	40			
				24-27	1	90.8	Tyler, et al., 1986[a]
				28-29	1	60.3	Tyler, et al., 1986[a]
	Karluk[c]		255-10	24-30	0	100.0	Tyler, et al., 1986[a]
			255-20	24-27	0	90.8	Tyler, et al., 1986[a]
				28-29	0	60.3	Tyler, et al., 1986[a]
	Red River	Ayakulik	256-10,20	24-27	1	1.0	Tyler, et al., 1986[a]
				28-29	1	0.5	Tyler, et al., 1986[a]
Karluk River late run	Afognak	Southwest Afognak	251-10,20	30-39	2	54.6	Tyler, et al., 1986[a]
	Uganik Bay		253-11,14,31,32,33,35				
				30-39	2	60.3	Tyler, et al., 1986[a]
			253-13	30-39	2	60.3	Tyler, et al., 1986[a]
	Uyak Bay[b]		254-10,20,30,40				
				30-39	2	60.3	Tyler, et al., 1986[a]
	Karluk[c]		255-10	31-39	0	100.0	Tyler, et al., 1986[a]
			255-20	31-39	1	60.3	Tyler, et al., 1986[a]
	Red River	Ayakulik	256-10,20	30-39	2	0.5	Tyler, et al., 1986[a]

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Table 4. (page 2 of 4)

Stock	District	Section	Area	Weeks	Migration Time To Nearest Week	Percentage Of Catch	Source
Red River early run	Afognak	Southwest Afognak	251-10,20	24-27	1	2.8	Tyler, et al., 1986[a]
				28	1	1.6	Tyler, et al., 1986[a]
	Uganik Bay		253-11,14,31,32,33,35				
				24-27	1	2.8	Tyler, et al., 1986[a]
				28	1	1.7	Tyler, et al., 1986[a]
	Uyak Bay[b]		254-10,20,30,40				
				24-27	1	2.8	Tyler, et al., 1986[a]
				28	1	1.7	Tyler, et al., 1986[a]
	Karluk[c]		255-20	24-27	1	2.8	Tyler, et al., 1986[a]
				28	1	1.7	Tyler, et al., 1986[a]
	Sturgeon River		256-30,40	24-27	0	65.3	Tyler, et al., 1986[a]
				28-29	0	7.8	Tyler, et al., 1986[a]
	Red River	Ayakulik	256-10,20	24-27	0	91.5	Tyler, et al., 1986[a]
				28-29	0	43.9	Tyler, et al., 1986[a]
		Gurney Bay	256-25	24-27	0	65.5	Tyler, et al., 1986[a]
				28-29	0	15.4	Tyler, et al., 1986[a]
	Alitak Bay	Cape Alitak	257-10,20	24-27	0	8.5	Tyler, et al., 1986[a]
				28-29	0	1.5	Tyler, et al., 1986[a]
Red River early run		Deadman/Portage Bay	257-50,60,70				
				24-27	0	8.5	Tyler, et al., 1986[a]
				28-29	0	1.5	Tyler, et al., 1986[a]
Red River late run	Afognak	Southwest Afognak	251-10,20	29-39	1	1.6	Tyler, et al., 1986[a]
	Uganik Bay		253-11,14,31,32,33,35				
				29-39	1	1.7	Tyler, et al., 1986[a]
			253-13	30-39	1	1.7	Tyler, et al., 1986[a]
	Uyak Bay[b]		254-10,20,30,40				
				29-39	1	1.7	Tyler, et al., 1986[a]
	Karluk[c]		255-20	29-39	1	1.7	Tyler, et al., 1986[a]
	Sturgeon River		256-30,40	30-39	0	7.8	Tyler, et al., 1986[a]
	Red River	Ayakulik	256-10,20	30-39	0	43.9	Tyler, et al., 1986[a]
		Gurney Bay	256-25	30-39	0	15.4	Tyler, et al., 1986[a]

-Continued-

Table 4. (page 3 of 4)

Stock	District	Section	Area	Weeks	Migration Time To Nearest Week	Percentage Of Catch	Source
Red River early run (continued)	Alitak Bay	Cape Alitak	257-10,20	30-39	0	1.5	Tyler, et al., 1986[a]
		Deadman/Portage Bay	257-50,60,70	30-39	0	1.5	Tyler, et al., 1986[a]
Upper Station early run	Afognak	Southwest Afognak	251-10,20	24-27	2	3.3	Tyler, et al., 1986[a]
	Uganik Bay		253-11,14,31,32,33,35				
				24-27	2	2.6	Tyler, et al., 1986[a]
	Uyak Bay[b]		254-10,20,30,40				
				24-27	2	2.6	Tyler, et al., 1986[a]
	Karluk[c]		255-20	24-27	2	2.6	Tyler, et al., 1986[a]
	Sturgeon River		256-30,40	24-27	2	32.6	Tyler, et al., 1986[a]
	Red River	Ayakulik	256-10,20	24-27	1	4.9	Tyler, et al., 1986[a]
				28	1	55.6	Tyler, et al., 1986[a]
		Gurney Bay	256-25	24-27	1	15.2	Tyler, et al., 1986[a]
				28	1	84.6	Tyler, et al., 1986[a]
	Alitak Bay	Cape Alitak	257-10,20	24-27	1	23.5	Tyler, et al., 1986[a]
				28	1	98.5	Tyler, et al., 1986[a]
		Upper Olga St.Area	257-30	24-29	0	95.0	Barrett, 1988
	Alitak Bay	Lower Olga St.Area	257-40	24-29	0	36.5	Barrett, 1988
	Alitak Bay	Moser Bay St. Area	257-41	24-28	0	44.4	Barrett, 1988
				29	0	95.0	
	Alitak Bay	Deadman/Portage Bay	257-50,60,70	24-27	1	23.5	Barrett, 1988
				28	1	98.5	Barrett, 1988
Upper Station late run	Afognak	Southwest Afognak	251-10,20	28-39	2	43.8	Tyler, et al., 1986[a]
	Uganik Bay		253-11,14,31,32,33,35				
				28-39	2	38.0	Tyler, et al., 1986[a]
			253-13	30-39	2	38.0	Tyler, et al., 1986[a]
	Uyak Bay[b]		254-10,20,30,40				
				28-39	2	38.0	Tyler, et al., 1986[a]
	Karluk[c]		255-20	28-39	2	38.0	Tyler, et al., 1986[a]
	Sturgeon River		256-30,40	28-39	2	92.2	Tyler, et al., 1986[a]
	Red River	Ayakulik	256-10,20	29-39	1	55.6	Tyler, et al., 1986[a]
		Gurney Bay	256-25	29-39	1	84.6	Tyler, et al., 1986[a]

-Continued-

Table 4. (page 4 of 4)

Stock	District	Section	Area	Weeks	Migration Time To Nearest Week	Percentage Of Catch	Source
Upper Station late run (continued)	Alitak Bay	Cape Alitak	257-10,20	29-39	1	98.5	Tyler, et al., 1986[a]
		Upper Olga St.Area	257-30	30-39	0	95.0	Barrett, B.M. 1988
		Moser/Olga Bay	257-40,41	30-39	0	95.0	Barrett, B.M. 1988
		Deadman/Portage Bay	257-50,60,70	29-39	1	98.5	Barrett, B.M. 1988
Fraser Lake							
	Afognak	Southwest Afognak	251-10,20	24-27	2	3.2	Tyler, et al., 1986[a]
	Uganik Bay		253-11,14,31,32,33,35	24-27	2	3.8	Tyler, et al., 1986[a]
	Uyak Bay[b]		254-10,20,30,40	24-27	2	3.8	Tyler, et al., 1986[a]
	Karluk[c]		255-20	24-27	2	3.8	Tyler, et al., 1986[a]
	Sturgeon River		256-30,40	24-27	2	2.1	Tyler, et al., 1986[a]
	Red River	Ayakulik	256-10,20	24-27	2	2.6	Tyler, et al., 1986[a]
		Gurney Bay	256-25	24-27	2	19.3	Tyler, et al., 1986[a]
	Alitak Bay	Cape Alitak	257-10,20	24-27	2	68.0	Tyler, et al., 1986[a]
		Lower Olga St.Area	257-40	24-29	0	58.3	Barrett, B.M. 1988
		Moser Bay St. Area	257-41	24-28	1	52.2	Barrett, B.M. 1988
		Deadman/Portage Bay	257-50,60,70	24-27	2	68.0	Barrett, B.M. 1988
Saltery Lake	General	Ugak	259-11	23-39		100.0	(Malloy, pers com)
Swikshak River	Mainland	Kukak	262-15	23-39		100.0	Terminal area
Kaflia Lake,	Mainland	Kukak	262-30	23-39		100.0	Terminal area

[a]Tag recovery data weighted to the 1981 and 1986 escapements.
[b]Includes that portion of the Karluk District (254-10) north of Rocky Point.
[c]Includes that portion of the Karluk District south of Rocky Point.

Table 5. Salmon escapements enumerated at Kodiak Management Area weirs, 1986.

WEIR	Escapement					Total
	Chinook	Sockeye	Coho	Pink	Chum	
Thorshiem Creek	0	6,383	302[a]	28,149	20	34,854
Waterfall Fishpass	0	0	0	48,384	0	48,384
Pauls Lake	0	5,402	9,510[a]	1,716	0	16,628
Afognak River	0	48,333	5,082[a]	68,052	6	121,473
Karluk River	4,429	Early 359,123 Late 528,048	24,565[a]	668,298	111	1,584,574
Red River (Ayakulik)	6,371	Early 265,567 Late 52,568	18,790[a]	560,210	90	903,596
Akalura Lagoon	0	Early 3,640[b] Late 9,792	2,100[a]	9,592	500	25,624
Upper Station	1	Early 99,965 Late 368,120	3,523[a]	1,422	0	473,031
Dog Salmon Creek	221	136,553[c]	5,458[a]	163,194	9,134	314,560
Buskin River	0	8,939	9,492[a]	110,958	52	129,441
Saltery Weir	3	38,314	11,676[a]	23,011	203	73,207
TOTALS	11,025	1,930,747	90,498	1,682,986	10,116	3,725,372

[a] Estimated total escapement, includes projected escapement after removal of the weir.
[b] Peak aerial survey expanded by a factor of 2.0 (Barrett et.al 1984).
[c] A total of 126,529 sockeye salmon were enumerated at the Fraser Lake fishpass.

Table 6. Commercial salmon catch by species in the Kodiak Management from 1976 to 1986.

YEAR	Catch (Number of Fish) Chinook	Sockeye	Coho	Pink	Chum	TOTAL
1976	766	641,484[a]	23,714	11,077,992	740,495	12,484,451
1977	585	623,468[a]	27,920	6,252,405	1,072,313	7,976,691
1978	3,228	1,071,782[a]	48,795	15,004,065	814,345	16,942,215
1979	1,905	631,735[a]	140,629	11,287,591	358,400	12,420,260
1980	529	651,394[a]	139,154	17,290,615	1,075,557	19,157,249
1981	1,418	1,288,980[a]	121,544	10,336,829	1,345,328	13,094,099
1982	1,238	1,204,793[a]	343,531	8,076,203	1,266,187	10,891,952
1983	3,839	1,231,989[a]	157,612	4,603,371	1,085,165	7,081,976
1984	4,657	1,950,439[a]	229,534	10,884,293	649,092	13,718,015
1985	4,970	1,843,185[a]	284,166	7,334,825	430,757	9,897,903
1976-1985 Average	2,314	1,113,925[a]	151,660	10,214,819	883,764	12,366,481
1986	4,381	3,188,046[a]	168,690	11,807,727	1,134,372	16,303,216

[a]Includes sockeye harvested in the Cape Igvak Section.

Table 7. Kodiak Management Area commercial salmon catch and effort by district, gear, and species, 1986.

DISTRICT	GEAR	NUMBER OF LANDINGS	Catch (Number of Fish) Chinook	Sockeye	Coho	Pink	Chum	TOTAL
Afognak	Purse Seine	586	140	53,644	15,885	1,190,768	35,367	1,295,804
	Beach Seine	18	0	677	527	12,375	293	13,872
	All Gear	604	140	54,321	16,412	1,203,143	35,660	1,309,676
Uganik Bay	Purse Seine	1,761	341	121,120	11,582	3,003,026	224,382	3,360,451
	Beach Seine	118	14	428	84	60,162	4,111	64,799
	Set Gillnet	2,486	113	170,753	8,030	1,181,584	74,565	1,435,045
	All Gear	4,365	468	292,301	19,696	4,244,772	303,058	4,860,295
Uyak Bay[a]	Purse Seine	1,769	219	227,885	25,636	1,480,145	108,297	1,842,182
	Beach Seine	86	3	126	102	53,839	1,039	55,109
	Set Gillnet	1,684	178	266,687	10,220	654,218	63,316	994,619
	All Gear	3,539	400	494,698	35,958	2,188,202	172,652	2,891,910
Karluk	Purse Seine	1,119	633	223,136	10,599	1,367,943	23,624	1,625,935
	Beach Seine	15	4	658	0	4,966	3	5,631
	All Gear	1,134	637	223,794	10,599	1,372,909	23,627	1,631,566
Sturgeon River	Purse Seine	481	161	130,560	6,449	299,991	11,926	449,087
	All Gear	481	161	130,560	6,449	299,991	11,926	449,087
Red River	Purse Seine	1,677	1,895	421,768	20,722	316,143	20,804	781,332
	All Gear	1,677	1,895	421,768	20,722	316,143	20,804	781,332
Alitak Bay	Purse Seine	1,701	120	526,207	17,214	626,126	63,406	1,233,073
	Beach Seine	20	0	100	65	22,705	2	22,872
	Set Gillnet	2,464	23	724,983	13,507	124,393	12,458	875,364
	All Gear	4,185	143	1,251,290	30,786	773,224	75,866	2,131,309
General	Purse Seine	718	242	53,424	13,370	489,555	83,952	640,543
	Beach Seine	28	0	0	966	18,782	223	19,971
	Set Gillnet	228	4	13,335	665	94,678	6,135	114,817
	All Gear	974	246	66,759	15,001	603,015	90,310	775,331
Mainland	Purse Seine	1,239	291	252,555	13,067	806,171	400,449	1,472,533
	Beach Seine	[b]	0	0	0	[b]	[b]	[b]
	All Gear	1,240	291	252,555	13,067	806,328	400,469	1,472,710
TOTALS	Purse Seine	11,051	4,042	2,010,299	134,524	9,579,868	972,207	12,700,940
	Beach Seine	286	21	1,989	1,744	172,986	5,691	182,431
	Set Gillnet	6,862	318	1,175,758	32,422	2,054,873	156,474	3,419,845
	All Gear	18,199	4,381	3,188,046	168,690	11,807,727	1,134,372	16,303,216

[a]Includes that portion of the Karluk District north of Rocky Point.
[b]Number of landings deleted to maintain confidentiality.

Table 8. Kodiak Management Area salmon catch, escapement, and run numbers, 1986.

Species	Catch (Number of Fish)				Total Est. Escapement	Total Run
	Commmercial	Sport	Subsistence	Total		
Chinook	4,381	489[b]	91[c]	4,961	11,050	16,011
Sockeye	3,000,030[a]	5,259[b]	144,451[c]	3,149,740	2,159,495	5,309,235
Coho	168,690	20,873[b]	7,087[c]	196,650	294,041	490,691
Pink	11,807,727	14,509[b]	2,371[c]	11,824,607	5,787,975	17,612,582
Chum	1,134,372	336[b]	605[c]	1,135,313	1,165,861	2,301,174
Total	16,115,200[a]	41,466[b]	154,605[c]	16,311,271	9,418,422	25,729,693

[a] Total excludes 188,016 Chignik River sockeye harvested at the Cape Igvak Section.
[b] Mills (1987).
[c] L. Malloy, ADF&G, Kodiak, personnal communication.

Table 9. Age composition of selected chinook salmon escapements from the Kodiak Management Area, 1986.

LOCATION	N		Age					
			1.2	1.3	1.4	2.3	1.5	Total
Karluk River	16	Percent	13.3	46.7	13.3	6.7	6.7	100.0
		Number	2	7	2	1	1	15
Red River (Ayakulik)	50	Percent	2.0	46.0	32.0	0.0	20.0	100.0
		Number	1	23	16	0	10	50
TOTALS	56	Percent	4.6	46.2	58.5	1.5	16.9	100.0
		Number	3	30	38	1	11	65

Table 10. Mean lengths and sex ratios of the sampled chinook salmon escapements in the Kodiak Management Area, 1986.

SYSTEM	Length (mm) N	Length (mm) MEAN	Length (mm) SE	SEX N	SEX M:F RATIO
Karluk River	15	820	44	16	0.6 :1
Red River (Ayakulik)	35	891	18	49	1.1 :1
Totals	50	870		55	1.0 :1

Table 11. Age composition of selected sockeye salmon catches in the Kodiak Management Area, 1986.

LOCATION	Age 0.1	0.2	1.1	0.3	1.2	2.1	1.3	2.2	3.1	1.4	2.3	3.2	2.4	3.3	Total
Uganik Bay District															
Percent	0.0	0.2	0.0	1.1	5.0	0.1	33.4	38.4	0.0	0.2	17.3	3.8	0.0	0.6	100.0
Numbers	0	547	132	3,191	14,471	219	97,502	112,177	0	574	50,575	11,184	0	1,733	292,301
Uyak Bay District[a]															
Percent	0.0	0.0	0.0	0.5	4.6	0.1	9.4	58.4	0.0	0.1	16.7	9.2	0.0	0.9	100.0
Numbers	0	111	0	2,425	22,812	646	46,680	288,959	202	253	82,391	45,483	55	4,678	494,698
Karluk District[b]															
Percent	0.0	0.2	0.2	0.7	6.5	0.7	6.5	62.8	0.0	0.0	17.6	4.0	0.0	0.7	100.0
Numbers	0	336	336	1,007	8,726	1,007	8,726	84,910	0	0	23,829	5,370	0	1,007	135,252
Red River District															
Percent	0.0	0.0	0.0	0.2	5.9	0.2	11.6	64.6	0.0	0.1	16.0	1.0	0.0	0.3	100.0
Numbers	0	207	0	828	24,837	1,054	48,957	272,532	0	414	67,663	4,199	0	1,075	421,768
Cape Alitak Section															
Percent	0.0	1.2	0.0	2.5	21.9	0.1	33.7	25.2	0.0	0.0	14.7	0.6	0.0	0.0	100.0
Numbers	0	5,309	0	11,395	100,057	387	154,212	115,165	194	52	67,442	2,906	0	194	457,313
Upper Olga Bay Statistical Area															
Percent	0.0	0.5	0.0	0.9	31.3	0.0	9.0	42.7	0.0	0.0	10.9	3.8	0.0	0.9	100.0
Numbers	0	399	0	797	26304	0	7572	35869	0	0	9166	3188	0	797	84092
Moser/Olga Bay Section															
Percent	0.0	0.9	0.0	2.9	19.2	0.0	36.2	25.6	0.0	0.1	14.9	0.2	0.0	0.0	100.0
Numbers	0	4,177	0	12,768	84,720	0	159,758	112,986	0	564	65,718	959	35	35	441,719
Cape Igvak Section															
Percent	0.0	0.4	0.0	1.1	13.3	0.0	46.5	13.3	0.0	1.1	24.0	0.4	0.0	0.0	100.0
Numbers	0	332	0	995	11,938	0	41,783	11,938	0	995	21,555	332	0	0	89,867
Percent	0.0	0.5	0.0	1.4	12.2	0.1	23.4	42.8	0.0	0.1	16.1	3.0	0.0	0.4	100.0
Total[c]	0	11,418	468	33,406	293,865	3,313	565,190	1,034,536	396	2,852	388,339	73,621	90	9,519	2,417,013

[a]Includes that portion of the Karluk District north of Rocky Point.
[b]Includes that portion of the Karluk District south of Rocky Point.

Table 12. Age composition of selected salmon sockeye runs in the Kodiak Management Area, 1986.

SYSTEM	Age 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	Total
AFOGNAK LAKE																
Catch (Ass):																
Percent	0.0	0.0	0.6	0.2	10.1	0.2	0.0	74.8	5.8	0.0	0.2	8.1	0.0	0.0	0.0	100.0
Numbers	0	0	52	17	847	17	0	6,261	484	0	17	675	0	0	0	8,371
Escapement:																
Percent	0.0	0.0	0.6	0.2	10.1	0.2	0.0	74.8	5.8	0.0	0.2	8.1	0.0	0.0	0.0	100.0
Numbers	0	0	300	100	4,893	100	0	36,150	2,796	0	100	3,895	0	0	0	48,333
Run:																
Percent	0.0	0.0	0.6	0.2	10.1	0.2	0.0	74.8	5.8	0.0	0.2	8.1	0.0	0.0	0.0	100.0
Numbers	0	0	352	117	5,740	117	0	42,411	3,280	0	117	4,570	0	0	0	56,704
LITTLE RIVER																
Escapement:																
Percent	0.0	0.0	0.0	0.0	1.4	0.2	0.0	0.6	37.1	0.0	0.0	59.5	0.8	0.0	0.4	100.0
Numbers	0	0	0	0	248	35	0	106	6,684	0	0	10,715	141	0	71	18,000
UGANIK LAKE																
Catch (Ass):																
Percent	0.0	0.0	0.2	0.0	16.9	0.0	0.0	56.3	6.0	0.0	0.2	19.9	0.2	0.2	0.0	100.0
Numbers	0	0	76	0	6,407	0	0	21,356	2,288	0	76	7,551	76	76	0	37,907
Escapement:																
Percent	0.0	0.0	0.2	0.0	16.9	0.0	0.0	56.3	6.0	0.0	0.2	19.9	0.2	0.2	0.0	100.0
Numbers	0	0	181	0	15,211	0	0	50,704	5,433	0	181	17,928	181	181	0	90,000
Run:																
Percent	0.0	0.0	0.2	0.0	16.9	0.0	0.0	56.3	6.0	0.0	0.2	19.9	0.2	0.2	0.0	100.0
Numbers	0	0	257	0	21,618	0	0	72,059	7,721	0	257	25,479	257	257	0	127,907

-Continued-

Table 12. (page 2 of 6)

SYSTEM	Age 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	Total
KARLUK LAKE, early run																
Catch (Ass):																
Percent	0.0	0.0	0.7	0	1.3	2.9	0.0	2.1	67.5	1.2	0.0	19	3.4	0.4	1.3	100.0
Numbers	0	0	2,678	15	4,985	10,904	0	8,031	252,551	4,649	0	71,083	12,563	1,550	4,889	373,898
Escapement:																
Percent	0.0	0.0	0.1	0.1	0.9	1.5	0.0	0.8	57.5	0.4	0.0	21.8	13.7	0.1	3.0	100.0
Numbers	0	0	276	472	3,349	5,222	0	2,925	206,423	1,608	0	78,235	49,376	536	10,701	359,123
Run:																
Percent	0.0	0.0	0.4	0.1	1.1	2.2	0.0	1.5	62.6	0.9	0.0	20.4	8.4	0.3	2.1	100.0
Numbers	0	0	2,954	487	8,334	16,126	0	10,956	458,974	6,257	0	149,318	61,939	2,086	15,590	733,021
KARLUK LAKE, late run[a]																
Catch (Ass):																
Percent	0.0	0.0	0.5	0.0	0.5	1.5	0.0	1.2	53.4	1.1	0.0	19.9	11.0	0.3	10.6	100.0
Numbers	0	0	1,769	0	1,769	5,350	0	4,396	188,457	3,741	0	70,173	38,824	891	37,432	352,802
Escapement:																
Percent	0.0	0.0	0.3	0.0	0.3	0.9	0.0	0.7	50.0	0.8	0.0	20.5	13.2	0.1	13.3	100.0
Numbers	0	0	1,499	0	1,499	4,514	0	3,744	263,851	4,331	0	108,410	69,454	749	69,998	528,048
Run:																
Percent	0.0	0.0	0.4	0.0	0.4	1.1	0.0	0.9	51.3	0.9	0.0	20.3	12.3	0.2	12.2	100.0
Numbers	0	0	3,267	0	3,267	9,864	0	8,140	452,308	8,072	0	178,584	108,278	1,641	107,429	880,850
RED RIVER, early run																
Catch (Ass):																
Percent	0.0	0.0	0.2	1.6	0.2	0.6	0.0	40.1	30.5	0.0	0.0	26.7	0.0	0.0	0.0	100.0
Numbers	0	0	522	4,159	538	1,658	0	104,068	79,209	0	16	69,468	76	0	92	259,806
Escapement:																
Percent	0.0	0.0	0.1	1.3	0.2	0.4	0.0	40.2	31.4	0.0	0.1	26.2	0.1	0.0	0.1	100.0
Numbers	0	0	258	3,530	441	1,133	0	106,745	83,281	0	183	69,459	177	0	360	265,567
Run:																
Percent	0.0	0.0	0.1	1.5	0.2	0.5	0.0	40.1	30.9	0.0	0.0	26.4	0.0	0.0	0.1	59.6
Numbers	0	0	780	7,689	979	2,791	0	210,813	162,490	0	199	138,927	253	0	452	525,373

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Table 12. (page 3 of 6)

SYSTEM	Age 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	Total
RED RIVER, late run[b]																
Catch (Ass):																
Percent	0.0	0.0	0.0	0.0	0.4	0.2	0.0	2.9	87.1	0.0	0.0	8.4	1.1	0.0	0.0	100
Numbers	0	0	0	0	276	146	0	2,122	64,538	0	0	6,192	812	0	0	74,086
Escapement:																
Percent	0.0	0.0	0.0	0.0	0.4	0.1	0.0	2.4	88.8	0.0	0.0	6.9	1.4	0.0	0.0	100.0
Numbers	0	0	0	0	212	58	0	1,257	46,657	0	0	3,650	734	0	0	52,568
Run:																
Percent	0.0	0.0	0.0	0.0	0.4	0.2	0.0	2.7	87.8	0.0	0.0	7.8	1.2	0.0	0.0	100.0
Numbers	0	0	0	0	488	204	0	3,379	111,195	0	0	9,842	1,546	0	0	126,654
AKALURA LAKE, early run																
Escapement:																
Percent	0.0	0.5	23.2	0.5	18.5	3.3	0.0	19.4	18.0	0.0	0.0	16.6	0.0	0.0	0.0	100.0
Numbers	0	17	845	17	673	121	0	707	656	0	0	604	0	0	0	3,640
AKALURA LAKE, late run																
Escapement:																
Percent	0.0	0.0	0.0	0.7	2.1	0.0	0.0	22.8	55.2	0.0	0.0	17.9	1.4	0.0	0.0	100.0
Numbers	0	0	0	68	203	0	0	2,229	5,401	0	0	1,756	135	0	0	9,792
UPPER STATION, early run																
Catch (Ass):																
Percent	0.0	0.4	1.3	2.8	50.6	1.4	0.0	5.4	37.1	0.0	0.0	1.0	0.0	0.0	0.0	100.0
Numbers	0	604	1,927	3,994	72,614	1,971	0	7,678	53,260	0	0	1,399	0	0	0	143,447
Escapement:																
Percent	0.0	0.1	0.6	0.5	53.0	0.4	0.0	2.0	40.0	0.0	0.0	3.4	0.0	0.0	0.1	100.0
Numbers	0	133	570	469	52,944	365	0	2,038	39,995	0	0	3,385	0	0	66	99,965
Run:																
Percent	0.0	0.3	1.0	1.8	51.6	1.0	0.0	4.0	38.3	0.0	0.0	2.0	0.0	0.0	0.0	100.0
Numbers	0	737	2,497	4,463	125,558	2,336	0	9,716	93,255	0	0	4,784	0	0	66	243,412

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Table 12. (page 4 of 6)

SYSTEM	Age 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	Total
UPPER STATION, late run																
Catch (Ass):																
Percent	0.1	11.8	0.0	26.3	21.5	0.5	0.3	11.2	26.5	0.0	0.0	1.5	0.1	0.0	0.1	100.0
Numbers	1,732	181,560	0	404,046	330,575	8,284	4,672	171,214	406,347	0	0	23,417	2,247	0	822	1,534,916
Escapement:																
Percent	0.2	13.1	0.0	23.3	26.2	0.4	0.1	10.7	24.8	0.0	0.0	1.2	0.1	0.0	0.0	100.0
Numbers	796	48,234	0	85,784	96,279	1,329	266	39,419	91,309	0	0	4,375	255	0	74	368,120
Run:																
Percent	0.1	12.1	0.0	25.7	22.4	0.5	0.3	11.1	26.2	0.0	0.0	1.5	0.1	0.0	0.0	100.0
Numbers	2,528	229,794	0	489,830	426,854	9,613	4,938	210,633	497,656	0	0	27,792	2,502	0	896	1,903,036
HORSE MARINE LAKE																
Escapement:																
Percent	0.0	0.0	0.0	1.7	8.5	0.0	0.0	37.3	22.0	0.0	0.0	28.8	0.0	0.0	1.7	100.0
Numbers	0	0	0	68	339	0	0	1,492	881	0	0	1,153	0	0	68	4,000
FRAZER LAKE																
Catch (Ass):																
Percent	0.0	0.0	0.0	0.0	12.9	0.1	0.0	1.0	3.8	0.0	0.0	79.8	0.5	0.0	1.8	100.0
Numbers	0	0	0	0	4,977	53	0	391	1,480	0	0	30,789	179	0	694	38,563
Escapement:																
Percent	0.0	0.0	0.0	0.0	13.3	0.2	0.0	1.4	4.4	0.0	0.0	79.1	4.0	0.0	1.2	100.0
Numbers	0	0	7	0	16,818	306	0	1,744	5,510	0	0	100,120	487	0	1,537	126,529
Run:																
Percent	0.0	0.0	0.0	0.0	13.2	0.2	0.0	1.3	4.2	0.0	0.0	79.3	0.4	0.0	1.4	100.0
Numbers	0	0	7	0	21,795	359	0	2,135	6,990	0	0	130,909	666	0	2,231	165,092
BUSKIN LAKE																
Catch (Ass):																
Percent	0.0	0.0	0.0	0.0	9.1	0.0	0.0	27.1	7.9	0.0	0.0	55.4	0.2	0.0	0.2	100.0
Numbers	0	0	0	0	731	0	0	2,174	637	0	0	4,442	19	0	19	8,022

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Table 12. (page 5 of 6)

SYSTEM	Age 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	Total
BUSKIN LAKE (continued)																
Escapement:																
Percent	0.0	0.0	0.0	0.0	9.1	0.0	0.0	27.1	7.9	0.0	0.0	55.4	0.2	0.0	0.2	100.0
Numbers	0	0	0	0	815	0	0	2,423	710	0	0	4,950	21	0	21	8,939
Run:																
Percent	0.0	0.0	0.0	0.0	9.1	0.0	0.0	27.1	7.9	0.0	0.0	55.4	0.2	0.0	0.2	100.0
Numbers	0	0	0	0	1,546	0	0	4,597	1,347	0	0	9,392	40	0	40	16,961
SALTERY LAKE																
Catch (Ass):																
Percent	0.0	0.0	0.4	2	2.6	0.0	0.0	88.8	0.4	0.0	0.6	5.1	0.0	0.0	0.0	100.0
Numbers	0	0	76	380	495	0	0	16,625	76	0	114	951	0	0	0	18,717
Escapement:																
Percent	0.0	0.0	0.4	2.0	2.6	0.0	0.0	88.8	0.4	0.0	0.6	5.1	0.0	0.0	0.0	100.0
Numbers	0	0	156	779	1,012	0	0	34,031	156	0	234	1,947	0	0	0	38,314
Run:																
Percent	0.0	0.0	0.4	2.0	2.6	0.0	0.0	88.8	0.4	0.0	0.6	5.1	0.0	0.0	0.0	100.0
Numbers	0	0	232	1,159	1,507	0	0	50,656	232	0	348	2,898	0	0	0	57,031
KAFLIA LAKE																
Catch (Ass):																
Percent	0.0	0.0	0.4	0.0	4.3	3.4	0.0	26.6	7.9	0.0	0.0	57.2	0.0	0.0	0.2	100.0
Numbers	0	0	19	0	220	172	0	1,357	401	0	0	2,914	0	0	10	5,093
Escapement:																
Percent	0.0	0.0	0.4	0.0	4.3	3.4	0.0	26.6	7.9	0.0	0.0	57.2	0.0	0.0	0.2	100.0
Numbers	0	0	90	0	1,036	811	0	6,394	1,891	0	0	13,734	0	0	45	24,000
Run:																
Percent	0.0	0.0	0.4	0.0	4.3	3.4	0.0	26.6	7.9	0.0	0.0	57.2	0.0	0.0	0.2	100.0
Numbers	0	0	109	0	1,256	983	0	7,751	2,292	0	0	16,648	0	0	55	29,093

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Table 12. (page 6 of 6)

SYSTEM	Age 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	Total
TOTAL																
Catch (Ass):																
Percent	0.1	6.4	0.2	14.4	14.9	1.0	0.2	12.1	36.8	0.3	0.0	10.1	1.9	0.1	1.5	100.0
Numbers	1,732	182,164	7,119	412,611	424,434	28,555	4,672	345,673	1,049,730	8,390	223	289,054	54,796	2,517	43,958	2,855,628
Escapement																
Percent	0.0	2.4	0.2	4.5	9.6	0.7	0.0	14.3	37.2	0.3	0.0	20.7	5.9	0.1	4.1	100.0
Numbers	796	48,384	4,182	91,287	195,972	13,994	266	292,108	761,629	5,939	698	424,316	120,962	1,466	82,941	2,044,938
Run:																
Percent	0.1	4.7	0.2	10.3	12.7	0.9	0.1	13.0	37.0	0.3	0.0	14.6	3.6	0.1	2.6	100.0
Numbers[c]	2,528	230,548	11,300	503,898	620,405	42,549	4,938	637,781	1,811,359	14,329	921	713,371	175,757	3,984	126,898	4,900,566

[a]The age composition of the sample was interpolated between weeks 28 to 39.
[b]Sample derived from the commercial catch from the terminal statistical area during weeks 30 and 31.

Table 13. Mean lengths and sex ratios of selected sockeye salmon catches in the Kodiak Management Area, 1986.

LOCATION	Length (mm) N	Mean	SE	SEX N	M:F Ratio
Uganik Bay District	3,069	563	1	3,575	1.1 :1
Uyak Bay District[a]	4,434	554	0	5,213	0.9 :1
Karluk District	403	518	2	489	0.8 :1
Red River District	1,815	524	1	2,227	0.8 :1
Cape Alitak Section	2,725	546	1	3,225	0.9 :1
Upper Olga Bay Statistical Area	211	515	2	236	0.9 :1
Moser/Olga Bay Section	2,524	550	1	2,971	0.8 :1
Cape Igvak Section	270	551	3	310	0.4 :1
TOTAL	15,451	549		18,246	0.9 :1
KODIAK STOCKS[b]	15,181	549		17,936	0.9 :1

[a]Includes catches from that portion of the Karluk District north of
[b]Excludes sample from Cape Igvak.

Table 14. Mean lengths and sex ratios of selected sockeye salmon escapements the Kodiak Management Area, 1986.

SYSTEM	RUN	ESCAPEMENT	LENGTH (mm) N	LENGTH (mm) MEAN	LENGTH (mm) SE	SEX N	SEX M:F RATIO
Afognak Lake		48,333	451	529	2	550	0.7 : 1
Little River		18,000	507	528	2	594	1.7 : 1
Uganik Lake		90,000	497	551	2	596	0.8 : 1
Karluk							
	Early	359,123	964	522	1	1,139	1.0 : 1
	Late	528,048	419	569	1	495	1.6 : 1
Red River							
	Early	265,567	808	543	1	788	1.0 : 1
	Late[a]	52,568	841	539	1	1,034	0.9 : 1
Akalura Lake							
	Early	3,640	211	446	6	265	1.2 : 1
	Late	9,792	145	560	4	175	1.4 : 1
Upper Station							
	Early	99,965	1,182	510	1	1,316	1.1 : 1
	Late	368,120	1,543	557	1	1,910	1.0 : 1
Horse Marine		4,000	59	543	5	67	1.6 : 1
Frazer		136,553	967	541	1	1,187	0.8 : 1
Buskin Lake		8,939	428	525	2	596	1.0 : 1
Saltery Lake		38,314	491	570	2	600	0.6 : 1
Kaflia Lake		24,000	533	529	2	598	1.0 : 1
	TOTALS	2,054,962	10,046	547[b]		11,910	1.1 : 1[b]

[a]Samples derived from the commercial catch from the terminal statistical area.
[b]Weighted by escapement.

Table 15. Age composition of selected coho salmon catches in the Kodiak Management Area, 1986.

Location	Statistical Area	N		Age 1.1	2.1	3.1	Total
Discoverer Bay	251-82	210	Percent	14.3	76.7	9.0	100.0
			Number	314	1,687	199	2,200
Zachar Bay	254-30	199	Percent	38.7	59.8	1.5	100.0
			Number	2,130	3,291	83	5,504
Swikshak Beach	262-15	220	Percent	44.6	47.7	7.7	100.0
			Number	1,534	1,643	266	3,443
TOTALS		629	Percent	35.7	59.4	4.9	100.0
			Number	3,978	6,621	548	11,147

Table 16. Mean lengths and sex ratios of selected coho salmon catches in the Kodiak Management Area, 1986.

Location	Statistical Area	Length (mm)			Sex	
		N	MEAN	SE	N	M:F RATIO
Discoverer Bay	251-82	210	622	3	278	1.0 : 1
Swikshak Beach	262-15	220	624	3	280	0.7 : 1
TOTAL		430	623		558	0.8 : 1

Table 17. Age composition of selected coho salmon escapements in the Kodiak Management Area, 1986.

SYSTEM		Age 2.0	3.0	1.1	2.1	3.1	4.1	Total
Afognak River								
	Percent	0.0	0.0	40.0	60.0	0.0	0.0	100.0
	Number	0	0	2,033	3,049	0	0	5,082
Karluk River								
	Percent	0.0	0.0	1.9	49.7	47.8	0.6	100.0
	Number	0	0	463	12,205	11,742	154	24,565
Akalura Lagoon								
	Percent	0.0	0.0	10.2	75.5	14.3	0.0	100.0
	Number	0	0	214	1,586	300	0	2,100
Upper Station								
	Percent	0.5	0.0	13.2	83.8	2.4	0.0	100.0
	Number	17	0	466	2,953	86	0	3,523
Dog Salmon Creek								
	Percent	0.0	0.0	24.2	64.5	11.3	0.0	100.0
	Number	0	0	1,320	3,521	616	0	5,458
Buskin River								
	Percent	1.8	0.9	49.1	47.6	0.6	0.0	100.0
	Number	173	86	4660	4516	58	0	9492
Saltery River								
	Percent	0.0	0.5	36.1	60.1	3.3	0.0	100.0
	Number	0	64	4,211	7,018	383	0	11,676
	Percent	0.3	0.3	21.5	55.5	22.4	0.3	100.0
	Totals	190	174	12,112	31,338	12,669	154	56,438

Table 18. Mean lengths and sex ratios of selected coho salmon escapements in the Kodiak Management Area, 1986.

SYSTEM	ESCAPEMENT	LENGTH (mm) N	LENGTH (mm) MEAN	LENGTH (mm) SE	SEX N	SEX M:F RATIO
Afognak Lake	5,082	64	629	6	67	1.2 : 1
Karluk	24,565	158	643	3	277	2.1 : 1
Akalura Lake	2,100	98	643	5	136	1.2 : 1
Upper Station	3,523	204	645	3	280	0.9 : 1
Dog Salmon Creek	5,458	62	654	5	100	1.9 : 1
Buskin Lake	9,492	327	656	4	404	1.3 : 1
Saltery Lake	11,676	183	625	3	280	1.2 : 1
TOTALS	61,896	1,096	642[a]		1544	1.6 : 1[a]

[a]Mean weighted by escapement.

Table 19. Age composition of selected chum salmon catches in the Kodiak Management Area, 1986.

Location	Statistical Area	N		Age 0.2	0.3	0.4	0.5	Total
Zachar Bay	254-30	203	Percent	1.0	81.3	17.2	0.5	100.0
			Number	1,085	1,051	6,816	195	39,531
Salua/Portage Bay	257-60	109	Percent	1.8	45.9	51.4	0.1	100.0
			Number	272	6,797	7,613	136	14,818
Kukak Bay	262-27	116	Percent	0.9	94.0	5.2	0.0	100.0
			Number	1,682	183,377	10,094	0	195,153
TOTALS		428	Percent	1.2	76.6	9.8	0.1	100.0
			Number	3,039	191,225	24,523	331	249,502

Table 20. Mean lengths and sex ratios of selected chum salmon catches in the Kodiak Management Area, 1986.

LOCATION	LENGTH (mm)			SEX	
	N	MEAN	SE	N	M:F RATIO
Zachar Bay	203	613	2	212	0.3 : 1
Salua/Portage Bay	109	623	4	120	1.5 : 1
Kukak Bay	116	628	3	120	1.0 : 1
TOTALS	428	620[a]		452	0.7 :1[a]

[a]Mean weighted by sample size.

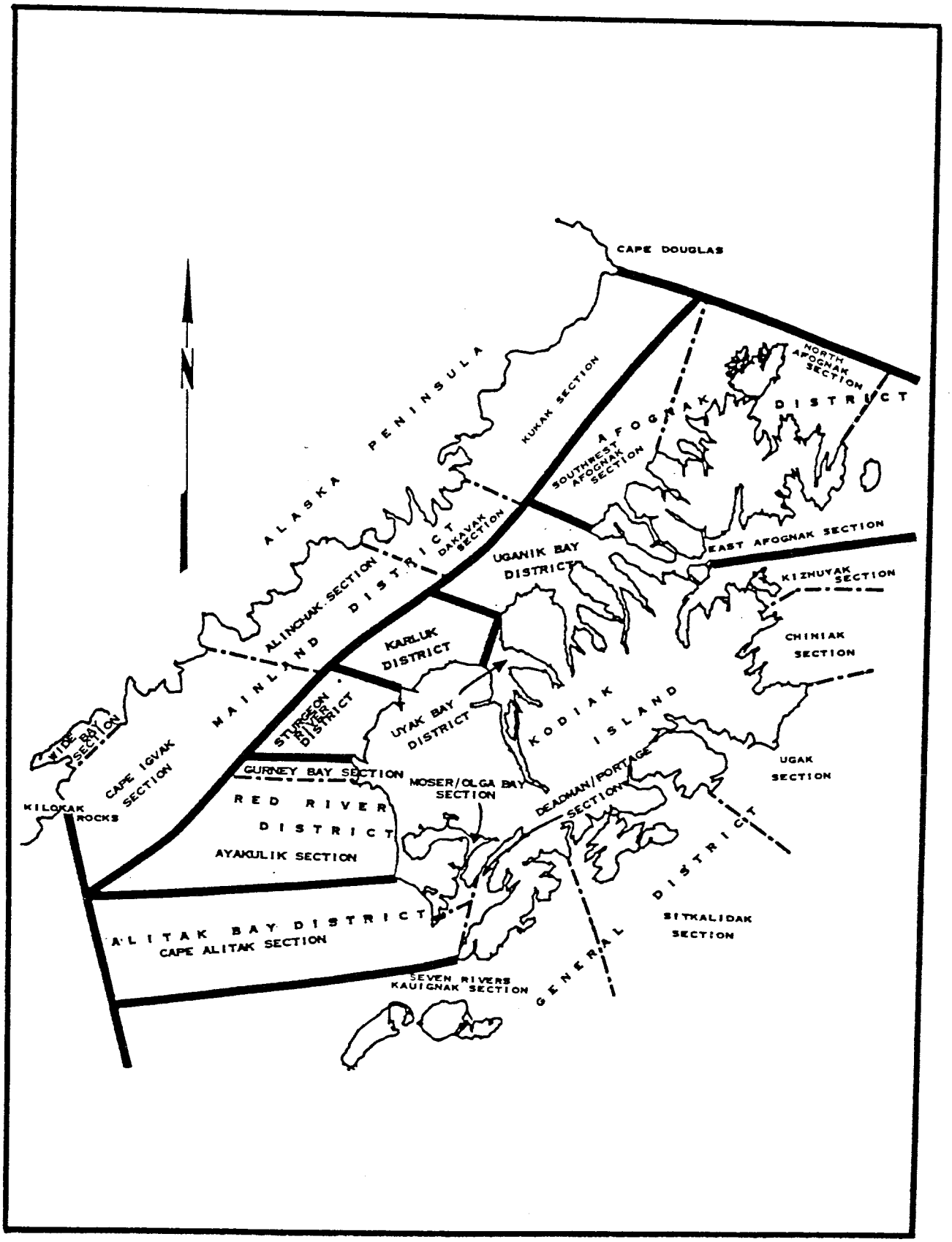

Figure 1. Kodiak Management Area districts and sections, 1986.

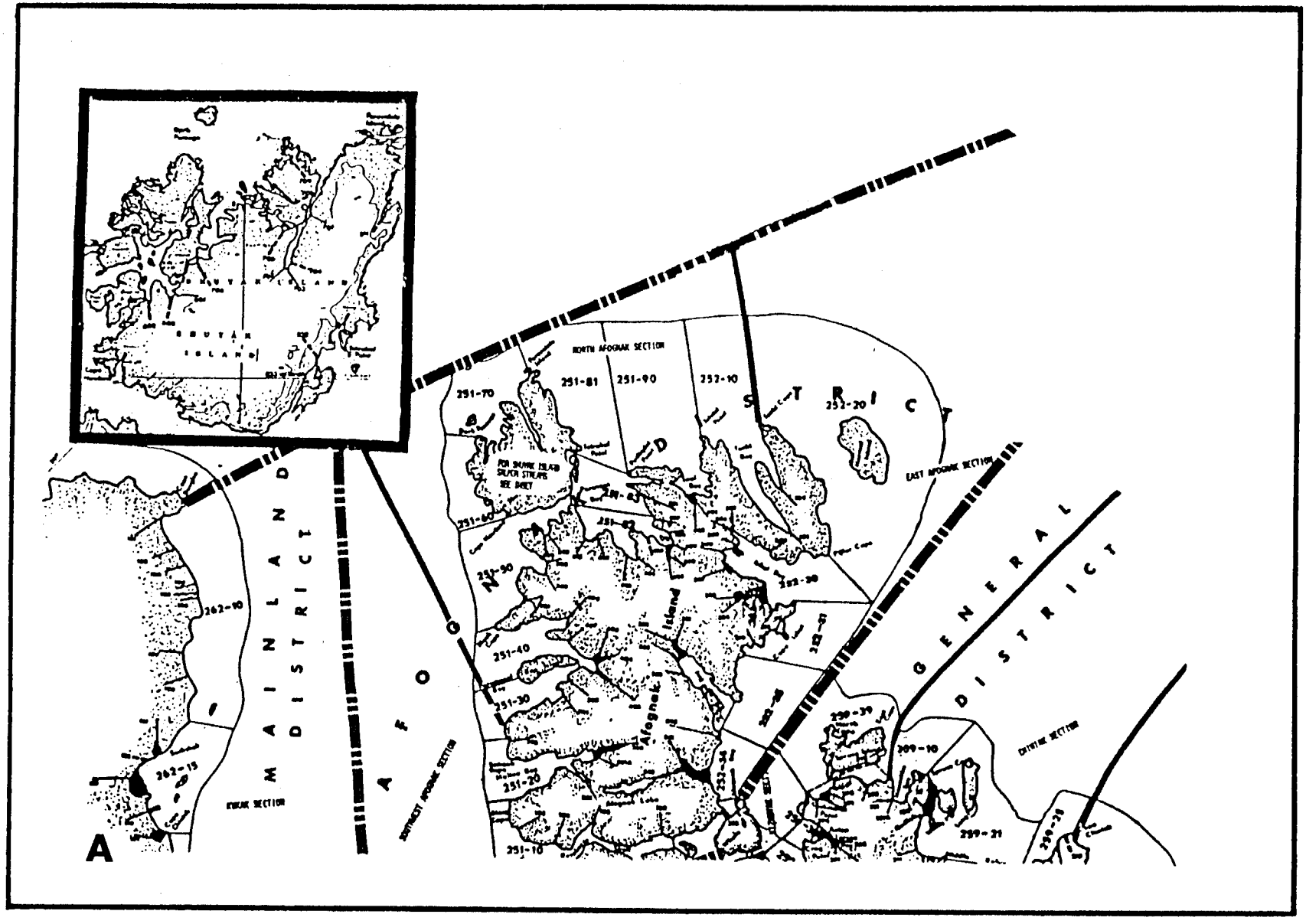

Figure 2. Kodiak Management Area districts, sections, and statistical areas, 1986.

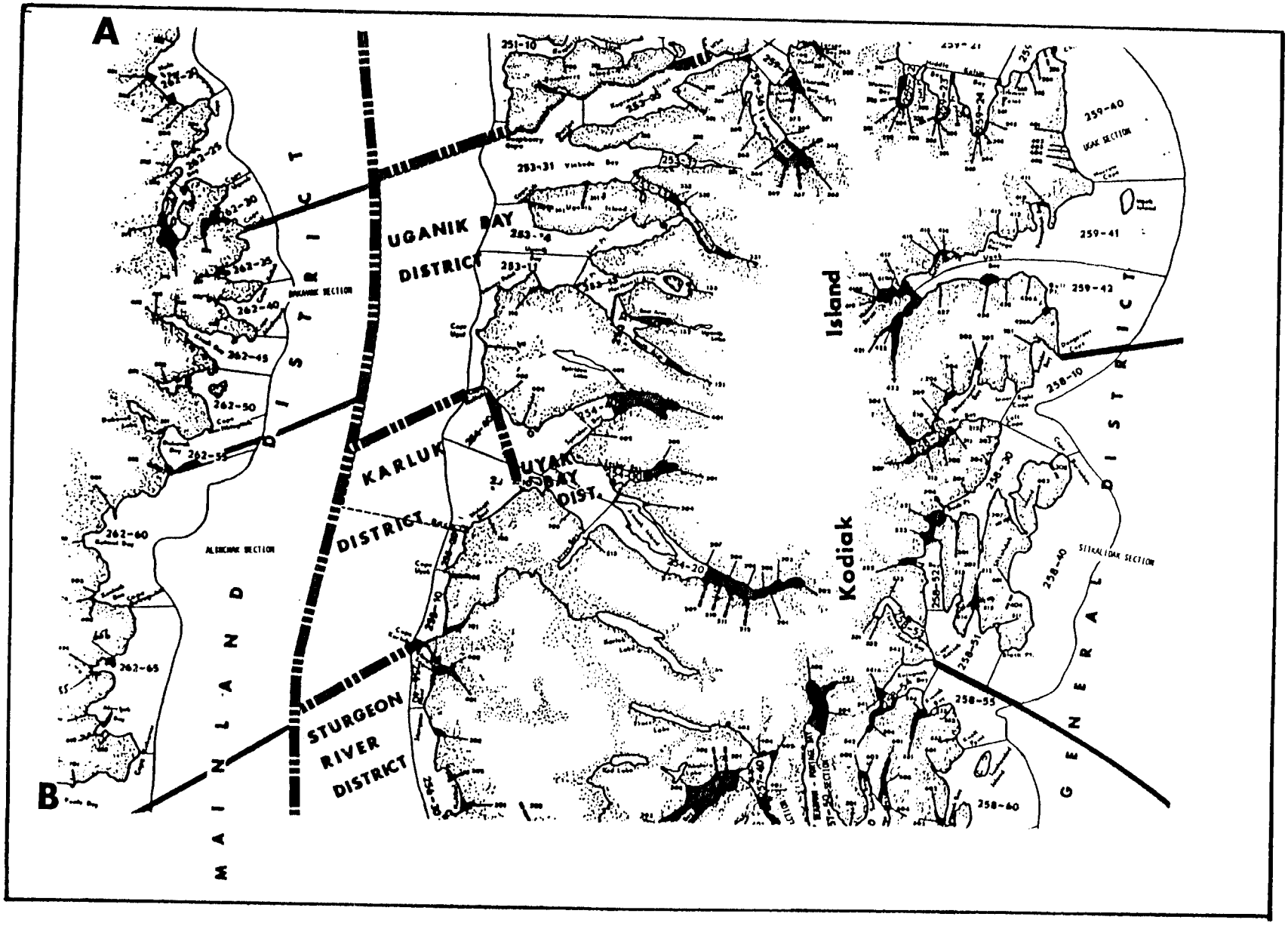

Figure 2. (p 2 of 3)

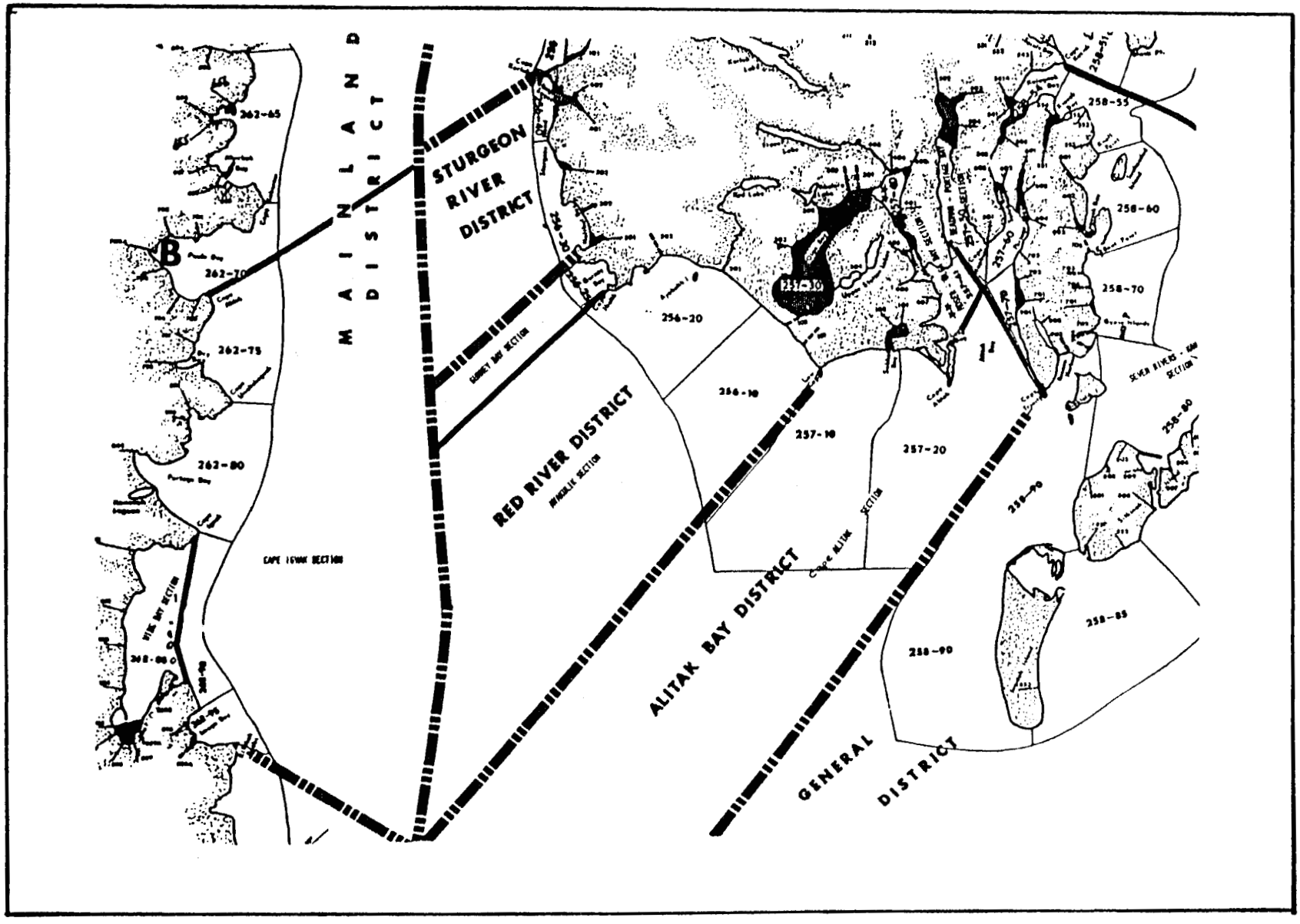

Figure 2. (p 3 of 3)

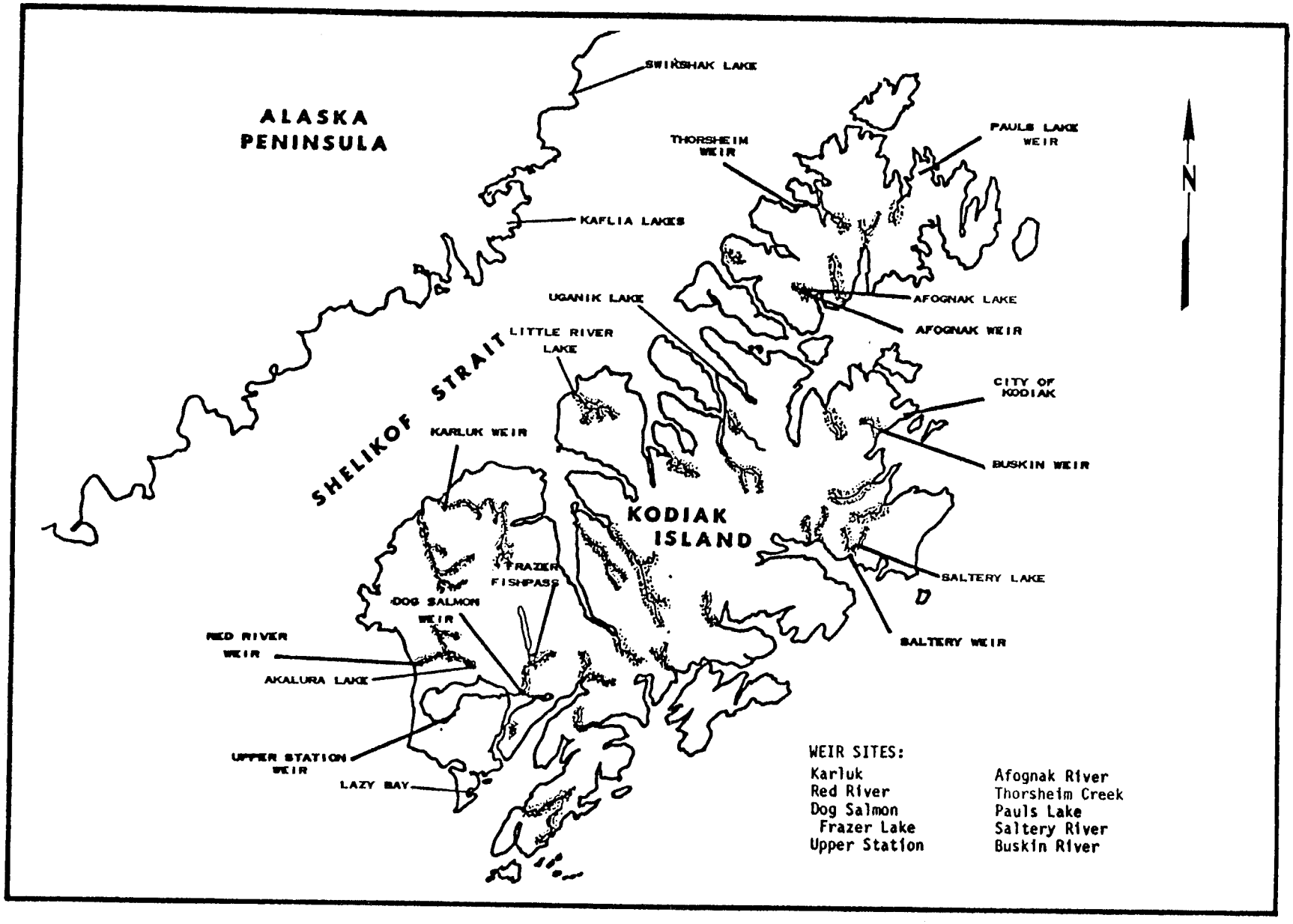

Figure 3. Kodiak catch and escapement sampling sites, 1986.

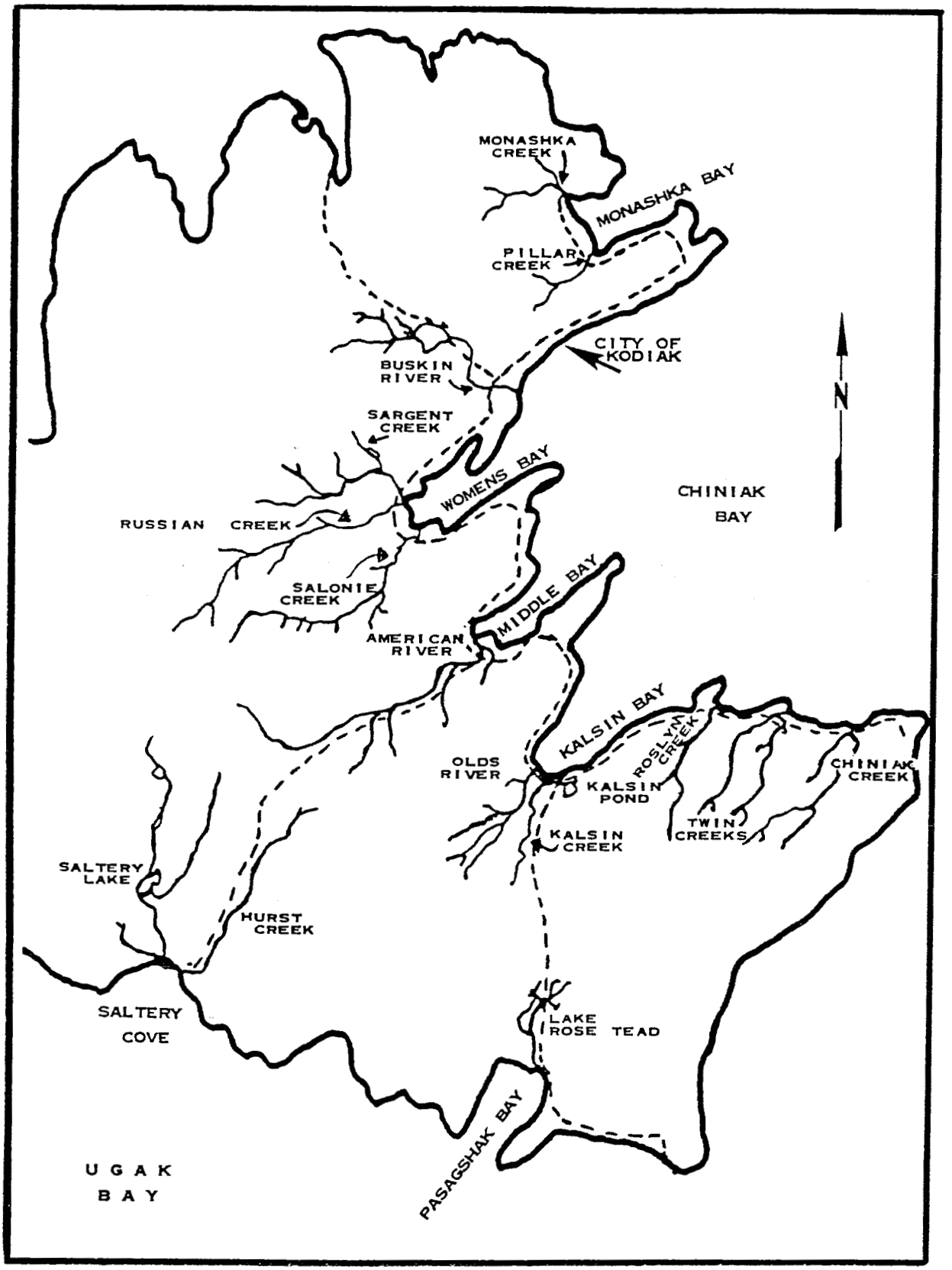

Figure 4. Location of coho streams on the Kodiak road system.

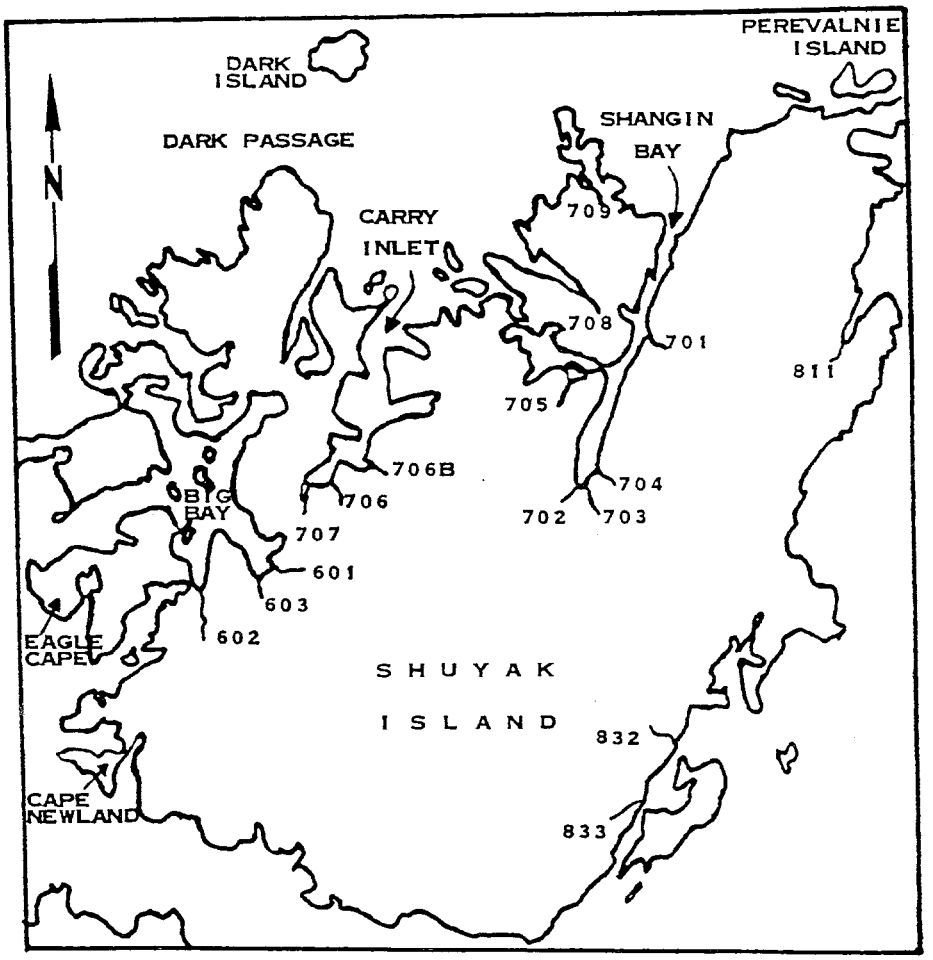

Figure 5. Location of coho streams on Shuyak Island.

APPENDICES

Appendix A. Allowable commercial salmon gear in the Kodiak Management Area from 1976 to 1986.

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[a]	X	X	X
Lower Olga Bay	257-40[a]	X	X	X
Upper Olga Bay	257-30[a]	X	X	X
Deadman-Portage Bay Section	257-50	X	X	
	257-60	X	X	
	257-70	X	X	

-Continued-

Appendix A. (page 2 of 2)

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	

[a] 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, 1986.

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

Apppendix C. Salmon peak escapement counts and estimated total escapement for Kodiak Management Area streams, 1986.

Stream Number	Chinook Salmon Peak Count	Chinook Salmon Est.Tot. Escape.	Sockeye Salmon Peak Count	Sockeye Salmon Est. Tot. Escape.	Coho Salmon Peak Count	Coho Salmon Est. Tot. Escape.[a]	Pink Salmon Peak Count	Pink Salmon Est. Tot. Escape.[b]	Chum Salmon Peak Count	Chum Salmon Est. Tot. Escape.[c]	Total Est. Escape.
AFOGNAK ISLAND DISTRICT											
Afognak Island[c]											
Selief											
251 -101	0	0	300	600[d]	900	2,160	3,200	3,987	0	0	6,747
251 -105	0	0	4,000	8,000[d]	2,500	6,000	25,000	45,000	0	0	59,000
251 -202	0	0	0	0	0	0	2,500	4,500	0	0	4,500
251 -301	0	0	0	0	0	0	0	0	1,200	2,040	2,040
Thorshiem Creek Weir											
251 -302	0	0	6,383	6,383	266	302[e]	26,489	26,489	16	16	33,190
251 -403	0	0	0	0	0	0	1,500	2,700	0	0	2,700
251 -404	0	0	0	0	0	0	2,500	5,759	0	0	5,759
251 -405	0	0	0	0	0	0	0	0	0	0	0
251 -502	0	0	0	0	0	0	2	354[f]	0	0	354
251 -503	0	0	0	0	0	0	0	2,400	0	0	2,400
251 -504	0	0	0	0	0	0	0	2,700	0	0	2,700
251 -505	0	0	0	0	0	0	0	7,000	0	0	7,000
Shuyak Island[c]											
Big Creek											
251-601	0	0	0	0	344	826[g]	0	0	0	0	826
251-602	0	0	0	0	800	1,920[g]	0	0	0	0	1,920
251-603	0	0	0	0	0	0	0	0	0	0	0
251-701	0	0	0	0	0	0	0	0	0	0	0
Shangin Bay											
251-70-[b]	0	0	0	0	625	1,500[h]	0	0	0	0	1,500
Whitey's Hole Weir											
251-705	0	0	0	0	650	650	0	0	0	0	650
Bear Creek Weir											
251-706	0	0	0	0	875	875	0	0	0	0	875
251-707	0	0	0	0	62	149[g]	0	0	0	0	149
251-708	0	0	0	0	20	48[g]	0	0	0	0	48
251-709	0	0	0	0	50	120[g]	0	0	0	0	120

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Apppendix C. (page 2 of 8)

Stream Number	Chinook Salmon Peak Count	Chinook Salmon Est.Tot. Escape.	Sockeye Salmon Peak Count	Sockeye Salmon Est. Tot. Escape.	Coho Salmon Peak Count	Coho Salmon Est. Tot. Escape.[a]	Pink Salmon Peak Count	Pink Salmon Est. Tot. Escape.[b]	Chum Salmon Peak Count	Chum Salmon Est. Tot. Escape.[c]	Total Est. Escape.
251-710	0	0	0	0	35	84[g]	0	0	0	0	84
251-711	0	0	0	0	60	144[g]	0	0	0	0	144
Afognak Island[c]											
Little Waterfall Fishpass											
251 -822	0	0	0	0	0	0	48,384	48,384	0	0	48,384
251 -823	0	0	0	0	0	0	0	200	0	0	200
251 -824	0	0	0	0	0	0	0	0	0	0	0
251 -825	0	0	0	0	0	0	16,000	28,800	0	0	28,800
251 -826	0	0	0	0	0	0	0	0	0	0	0
251 -827	0	0	0	0	0	0	0	1,000	0	0	1,000
251 -829	0	0	0	0	50	120	400	720	0	0	840
Pauls Lake Weir											
251 -831	0	0	5,402	5,402	9,403	9,510[e]	1,716	1,716	0	0	16,628
251 -901	0	0	0	0	0	0	400	10,220[f]	0	0	10,220
251 -902	0	0	0	0	0	0	0	400	0	0	400
252 -101	0	0	0	0	0	0	1,800	3,240	0	0	3,240
252 -102	0	0	0	0	0	0	3,000	5,400	0	0	5,400
Kitoi Hatchery											
252 -324	0	0	0	0	0	0	122,742	122,742	0	0	122,742
NE Danger											
252 -331	0	0	0	0	222	633[f]	0	0	0	0	633
252 -332	0	0	0	0	0	0	5,500	13,586	0	0	13,586
Afognak River Weir											
252 -342	0	0	48,333	48,333	3,545	5,082[e]	67,954	67,954	0	0	121,369
252 -343	0	0	0	0	0	0	36,000	372,000[f]	500	850	372,850
252 -521	0	0	0	0	6,300	15,120	3,400	6,120	1,100	1,870	23,110
KODIAK ISLAND											
253 -115	0	0	9,000	18,000[d]	0	0	72,000	93,067	0	0	111,067
253 -122	0	0	45,000	90,000[d]	5,400	12,960	197,000	324,600	250	425	427,985
253 -321	0	0	0	0	0	0	800	2,240[f]	0	0	2,240
253 -331	0	0	0	0	1,222	2,933	180,000	277,671	10,000	21,367	301,971
253 -332	0	0	0	0	0	0	2,800	3,300[f]	0	0	3,300

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Apppendix C. (page 3 of 8)

Stream Number	Chinook Salmon Peak Count	Chinook Salmon Est.Tot. Escape.	Sockeye Salmon Peak Count	Sockeye Salmon Est. Tot. Escape.	Coho Salmon Peak Count	Coho Salmon Est. Tot. Escape.[a]	Pink Salmon Peak Count	Pink Salmon Est. Tot. Escape.[b]	Chum Salmon Peak Count	Chum Salmon Est. Tot. Escape.[c]	Total Est. Escape.
253 -333	0	0	0	0	0	0	300	540	0	0	540
253 -404	0	0	0	0	0	0	0	0	0	0	0
254 -103	0	0	0	0	0	0	10	3,218[f]	0	0	3,218
254 -201	0	0	0	0	0	0	250	450	0	0	450
254 -202	0	0	0	0	0	0	54,000	60,000[f]	0	0	60,000
254 -204	0	0	0	0	0	0	152,000	336,667	0	0	336,667
254 -213	0	0	0	0	0	0	0	0	0	0	0
254 -301	0	0	0	0	1,300	3,120	130,400	260,773	15,600	29,993	293,886
254 -401	0	0	0	0	6,300	15,120	44,000	79,200	67,000	147,180	241,500
Karluk River Weir											
255 -101 Early			359,123	359,123							
Late			528,048	528,048							
Total	4,429	4,429	887,171	887,171	22,836	24,565[e]	668,298	668,298	111	111	1,584,574
Red River Weir											
256 -201 Early			265,567	265,567							
Late			52,568	52,568							
Total	6,371	6,371	318,135	318,135	12,215	16,474[e]	560,210	560,210	90	90	901,280
256 -301	0	0	0	0	0	0	1,500	2,700	0	0	2,700
256 -302	0	0	0	0	30	72	0	0	0	0	72
256 -303	0	0	0	0	0	0	0	0	0	0	0
256 -401	0	0	0	0	0	200[f]	14,000	23,033	92,000	178,165	201,398
256 -402	0	0	0	0	0	0	13,000	23,400	0	0	23,400
257 -102	0	0	0	0	0	0	0	0	14,000	23,800	23,800
Akalura Creek Weir											
257 -302 Early			1,820	3640[d]							
Late			9,792	9792[e]							
Total	0	0	11,305	13,432[e]	1,371	2,100[e]	9,592	9,592	500	500	25,624
Upper Station Lakes Weir											
257 -304 Early			99,965	99,965							
Late			368,120	368,120[e]							
Total	1	1	468,085	468,085[e]	2,469	3,523[e]	1,422	1,422	0	0	473,031

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Apppendix C. (page 4 of 8)

Stream Number	Chinook Salmon Peak Count	Chinook Salmon Est.Tot. Escape.	Sockeye Salmon Peak Count	Sockeye Salmon Est. Tot. Escape.	Coho Salmon Peak Count	Coho Salmon Est. Tot. Escape.[a]	Pink Salmon Peak Count	Pink Salmon Est. Tot. Escape.[b]	Chum Salmon Peak Count	Chum Salmon Est. Tot. Escape.[c]	Total Est. Escape.
257 -401	0	0	0	0	0	0	300	8,540[f]	0	0	8,540
257 -402	0	0	2,000	4,000[d]	0	0	12,000	21,600	0	0	25,600
Dog Salmon Weir (Frazer Lake Outlet)											
257 -403	221	221	136,553	136,553[h]	5,394	5,458[e]	149,194	163,194[i]	9,134	9,134[i]	314,560
257 -502	0	0	0	0	1,000	2,400	54,000	97,000[f]	1,000	1,227	100,627
257 -503	0	0	0	0	0	0	650	1,297	300	510	1,807
257 -603	0	0	0	0	0	0	3,900	4,007	600	621	4,628
257 -701	0	0	0	0	0	0	118,000	177,133	0	0	177,133
257 -703	0	0	0	0	0	0	10	10	0	0	10
258 -101	0	0	0	0	0	0	900	1,605	0	0	1,605
258 -201	0	0	0	0	0	0	0	0	0	0	0
258 -202	0	0	0	0	0	0	0	0	0	0	0
258 -203	0	0	0	0	600	1,440	0	0	5,000	8,500	9,940
258 -204	0	0	0	0	0	0	200	360	2,800	4,760	5,120
258 -205	0	0	0	0	0	0	0	0	900	1,530	1,530
258 -206	0	0	0	0	0	0	0	0	1,800	3,060	3,060
258 -207	0	0	0	0	0	0	2,800	5,040	1,400	1,400	6,440
258 -301	0	0	0	0	0	0	200	360	4,300	7,310	7,670
258 -302	0	0	0	0	0	0	300	540	1,200	2,040	2,580
258 -303	0	0	0	0	0	0	0	0	0	0	0
258 -304	0	0	0	0	0	0	2,300	4,366	0	0	4,366
258 -305	0	0	0	0	0	0	60	108	0	0	108
258 -306	0	0	0	0	0	0	0	0	0	0	0
Ocean Beach Lagoon											
258 -401	0	0	8,500	17,000[d]	0	0	0	0	0	0	17,000
258 -402	0	0	0	0	0	0	2,700	4,860	20	34	4,894
258 -511	0	0	0	0	7,400	17,760	20,000	36,000	4,000	6,800	60,560
258 -512	0	0	0	0	0	40[f]	500	900	4,500	7,850[f]	8,790
258 -513	0	0	0	0	200	580[f]	1,000	1,800	4,000	6,800	9,180
258 -514	0	0	0	0	0	0	60	108	2	3	111
258 -515	0	0	0	0	0	0	50	90	20	34	124
258 -521	0	0	0	0	12,000	28,800	40,000	73,080	12,000	12,000	113,880
258 -522	0	0	0	0	4,000	10,100[f]	51,000	165,077	5,000	12,067	187,244
258 -523	0	0	0	0	140	336	0	0	60	102	438
258 -524	0	0	0	0	0	0	0	0	0	400	400
258 -531	0	0	0	0	0	0	0	0	0	0	0
258 -532	0	0	0	0	0	0	1,880	3,384	20	34	3,418
258 -533	0	0	0	0	0	0	0	20[f]	0	0	20

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Apppendix C. (page 5 of 8)

Stream Number	Chinook Salmon Peak Count	Chinook Salmon Est.Tot. Escape.	Sockeye Salmon Peak Count	Sockeye Salmon Est. Tot. Escape.	Coho Salmon Peak Count	Coho Salmon Est. Tot. Escape.[a]	Pink Salmon Peak Count	Pink Salmon Est. Tot. Escape.[b]	Chum Salmon Peak Count	Chum Salmon Est. Tot. Escape.[c]	Total Est. Escape.
258 -542	0	0	0	0	0	0	4,600	10,280[f]	0	0	10,280
258 -544	0	0	0	0	0	0	400	720	0	0	720
258 -552	0	0	0	0	0	0	1,300	2,340	0	0	2,340
258 -553	0	0	0	0	0	0	550	2,090[f]	0	0	2,090
258 -555	0	0	0	0	0	0	4,100	9,680[f]	0	0	9,680
258 -602	0	0	0	0	0	0	3,200	3,693	6,000	12,000	15,693
258 -603	0	0	0	0	0	0	0	0	0	0	0
258 -701	0	0	0	0	0	0	78,000	83,840	0		83,840
258 -703	0	0	0	0	0	0	1,800	3,240	0	0	3,240
258 -704	0	0	0	0	0	0	30	54	0	0	54
258 -705	0	0	0	0	0	0	0	0	0	0	0
Monashka Creek 259 -101	0	0	0	0	163	391	4,000	9,090	0	3	9,484
Pillar Creek 259 -102	0	0	1	2	42	101	6,215	15,593	1	2	15,698
Buskin River Weir 259 -211	0	0	8,939	8,939	9,045	8,598[e]	98,958	98,958	52	52	116,547
Sargent Creek 259 -221	0	0	0	0	39	94	3,500	6,300	0	0	6,394
Russian Creek 259 -222	0	0	0	0	107	257	14,000	25,200	4,000	6,800	32,257
Salonie Creek 259 -223	0	0	0	0	164	394	18,000	24,739	5,000	5,263	30,396
American River 259 -231	0	0	0	0	212	509	21,000	24,780	4,000	6,800	32,089
Sid Olds River 259 -242	0	0	0	0	1,839	4,414	52,000	56,000[f]	8,000	13,000[f]	73,414
Kalsin Creek 259 -243	0	0	0	0	101	242	0	0	0	0	242
Kalsin Pond 259 -243	0	0	0	0	6	14	0	0	0	0	14
Franks Creek 259 -244	0	0	0	0	0	0	150	270	0	0	270
Myrtle Creek 259 -245	0	0	0	0	0	0	700	917	0	0	917
Roslyn Creek 259 -251	0	0	1	2	305	732	27,000	27,015[f]	0	0	27,749

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Apppendix C. (page 6 of 8)

Stream Number	Chinook Salmon Peak Count	Chinook Salmon Est.Tot. Escape.	Sockeye Salmon Peak Count	Sockeye Salmon Est. Tot. Escape.	Coho Salmon Peak Count	Coho Salmon Est. Tot. Escape.[a]	Pink Salmon Peak Count	Pink Salmon Est. Tot. Escape.[b]	Chum Salmon Peak Count	Chum Salmon Est. Tot. Escape.[c]	Total Est. Escape.
Twin Creek											
259 -252	0	0	0	0	3	7	1,600	3,080[f]	0	0	3,087
Capelin Creek											
259 -253	0	0	0	0	0	0	50	390[f]	0	0	390
Chiniak Creek											
259 -254	0	0	0	0	48	115	7,000	13,000[f]	0	0	13,115
Barabara Creek											
259 -363	0	0	900	1,800[d]	0	0	0	0	0	0	1,800
259 -364	0	0	0	0	0	0	2,500	4,500	0	0	4,500
259 -365	0	0	0	0	0	0	25,000	83,917	55,000	149,413	233,330
259 -366	0	0	0	0	20	48	4,000	7,200	40	68	7,316
259 -368	0	0	0	0	0	0	0	10[f]	0	0	10
259 -371	0	0	0	0	0	0	125,000	145,890	15,000	50,267	196,157
259 -372	0	0	0	0	0	0	2,000	3,600	0	0	3,600
259 -391	0	0	0	0	0	0	4,000	14,200[f]	0	0	14,200
259 -392	0	0	0	0	0	0	800	3,440[f]	0	0	3,440
259 -393	0	0	0	0	0	0	140	452[f]	0	0	452
259 -394	0	0	0	0	0	0	400	1,620[f]	0	0	1,620
259 -397	0	0	0	0	0	0	0	100[f]	0	0	100
259 -401	0	0	0	0	0	0	3,000	5,400	0	0	5,400
259 -402	0	0	0	0	0	0	0	0	0	0	0
259 -403	0	0	0	0	0	0	0	0	0	0	0
259 -404	0	0	0	0	0	0	0	0	0	0	0
259 -405	0	0	0	0	0	0	0	0	0	0	0
259 -410	0	0	0	0	0	0	1,800	3,240	0	0	3,240
Lake Rose Tead											
259 -411	25	25	3,200	6,400[d]	3,481	8,354	0	0	0	0	14,779
259 -412	0	0	2,500	5,000[d]	500	1,200	19,000	22,762	1,000	1,700	30,662
259 -413	0	0	0	0	0	0	0	0	0	0	0
Hurst Creek											
259 -414	0	0	0	0	402	965	9,000	16,200	200	340	17,505
Saltery River Weir											
259 -415	3	3	38,314	38,314	11,009	11,676[e]	22,275	22,275	189	189	72,457
259 -416	0	0	0	0	128	307	8,000	14,400	8,000	13,600	28,307
259 -417	0	0	0	0	0	0	0	0	0	0	0
259 -418	0	0	0	0	0	0	0	0	150	265[f]	265
259 -418B	0	0	0	0	0	0	150	270	0	0	270
259 -419A	0	0	0	0	0	0	0	0	10	17	17

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Apppendix C. (page 7 of 8)

Stream Number	Chinook Salmon Peak Count	Chinook Salmon Est.Tot. Escape.	Sockeye Salmon Peak Count	Sockeye Salmon Est. Tot. Escape.	Coho Salmon Peak Count	Coho Salmon Est. Tot. Escape.[a]	Pink Salmon Peak Count	Pink Salmon Est. Tot. Escape.[b]	Chum Salmon Peak Count	Chum Salmon Est. Tot. Escape.[c]	Total Est. Escape.
259 -422	0	0	80	144[j]	0	0	2,200	3,960	0	0	4,104
259 -423	0	0	0	0	0	0	50	290[f]	400	680	970
259 -424	0	0	0	0	0	0	5,500	8,300	4,500	4,500	12,800
259 -425	0	0	0	0	0	0	0	100	0	0	100
259 -426A	0	0	0	0	0	0	200	1,360[f]	0	0	1,360
259 -426B	0	0	0	0	0	0	0	0	3,100	6,827	6,827
259 -427	0	0	0	0	0	0	100	580[f]	12	20	600
MAINLAND											
262 -101	0	0	0	0	0	0	50	90	500	850	940
262 -102	0	0	0	0	0	0	400	720	4,000	7,000[f]	7,720
262 -103	0	0	0	0	0	0	1,100	2,030[f]	0	0	2,030
262 -104	0	0	0	0	0	0	0	0	20	34	34
262 -105	0	0	400	800[d]	0	0	0	0	0	0	800
262 -106	0	0	0	0	0	0	1,000	1,800	100	170	1,970
262 -107	0	0	0	0	0	0	50	90	50	85	175
262 -108	0	0	0	0	0	0	0	0	0	0	0
262 -151	0	0	18,000	36,000[d]	22,500	54,000	0	0	2,000	3,400	93,400
262 -152	0	0	0	0	500	1,200	30,000	30,000	31,000	54,000	85,200
262 -153	0	0	0	0	0	0	21,000	29,593	17,000	21,700	51,293
262 -154	0	0	0	0	0	0	0	0	8,500	14,450	14,450
262 -201	0	0	0	0	5,600	0	2,300	4,140	11,600	19,720	23,860
262 -203	0	0	0	0	3,000	7,200	22,000	22,000	9,000	14,327	43,527
262 -204	0	0	0	0	0	0	100	180	900	1,530	1,710
262 -205	0	0	0	0	0	0	1,500	19,500[f]	0	200	19,700
262 -254	0	0	0	0	0	0	0	3,000[f]	0	0	3,000
262 -271	0	0	0	0	0	0	7,000	15,133	32,000	50,500[f]	65,633
262 -272	0	0	0	0	0	0	0	0	1,000	1,000	1,000
Kaflia Lakes											
262 -301 Early			6,000	12,000[d]							
Late			12,000	24,000[d]							
Total	0	0	18,000	36,000[d]	0	0	0	0	0	0	36,000
262 -401	0	0	0	0	0	0	0	1,500[f]	0	0	1,500
262 -402	0	0	0	0	0	0	1,000	15,300[f]	0	0	15,300

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Apppendix C. (page 8 of 8)

Stream Number	Chinook Salmon Peak Count	Chinook Salmon Est.Tot. Escape.	Sockeye Salmon Peak Count	Sockeye Salmon Est. Tot. Escape.	Coho Salmon Peak Count	Coho Salmon Est. Tot. Escape.[a]	Pink Salmon Peak Count	Pink Salmon Est. Tot. Escape.[b]	Chum Salmon Peak Count	Chum Salmon Est. Tot. Escape.[c]	Total Est. Escape.
262 -451	0	0	0	0	0	0	5,000	15,500[f]	0	0	15,500
262 -501	0	0	0	0	0	0	6,500	54,300[f]	0	0	54,300
262 -551	0	0	0	0	0	0	45,000	104,383	30,000	35,867	140,250
262 -602	0	0	0	0	0	0	12,000	21,600	44,000	76,000[f]	97,600
262 -604	0	0	0	0	0	0	108,000	140,400	5,800	9,860	150,260
262 -605	0	0	0	0	0	0	2,400	6,320[f]	0	0	6,320
262 -651	0	0	0	0	0	0	52,000	102,000[f]	0	0	102,000
262 -652	0	0	0	0	0	0	500	1,300[f]	0	0	1,300
262 -653	0	0	0	0	0	0	300	540	100	170	710
262 -654	0	0	2,500	5,000[d]	0	0	7,000	12,600	3,000	12,000[f]	29,600
262 -655	0	0	0	0	0	0	150	320[f]	0	0	320
262 -656	0	0	0	0	0	0	3,500	6,300	0	0	6,300
262 -702	0	0	0	0	0	0	16,000	28,800	0	0	28,800
262 -705	0	0	0	0	0	0	100	180	0	0	180
262 -752	0	0	0	0	0	0	0	0	2,330	3,961	3,961
262 -801	0	0	0	0	0	0	950	1,710	75	128	1,838
262 -802	0	0	0	0	0	0	16,400	29,520	400	680	30,200
262 -851	0	0	0	0	0	0	214,208	20,000	37,000	62,667	82,667
262 -852	0	0	0	0	0	0	2,100	3,780	0	0	3,780
262 -853	0	0	0	0	0	0	800	1,440	0	0	1,440
262 -856	0	0	0	0	0	0	11,500	20,700	1,000	1,700	22,400
262 -858	0	0	0	0	0	0	800	1,640[f]	5,400	9,433	11,073
TOTALS	11,050	11,050	2,052,794	2,159,495	169,798	294,041	4,108,049	5,787,975	621,852	1,165,861	9,418,422

[a]Peak surveys expanded by 2.4:1.
[b] Single surveys expanded by 1.8:1, multiple surveys applied Johnson and Barrett (1988) model.
[c] Single surveys expanded by 1.7:1, multiple surveys applied Johnson and Barrett (1988) model.
[d]Peak surveys expanded by 2.0:1.
[e]Includes estimate of escapement after removal of the weir.
[f]Includes terminal escapement in bay count.
[g] Surveys include counts in the estuary and lower 200-300 yds of stream. Data not recorded seperately.
[h] Stream # 251-70-, includes data for stream #'s 251-702, 703, and 704 which have a common milling area.
[i]Includes fish spawning below weir.
[j]Peak surveys expanded by 1.8:1.

Appendix D. Commercial salmon catch sampling locations and catch areas sampled, 1986.

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	X	X		
	Karluk Bay District	purse seine	X			
	Spiridon Bay	purse seine		X		
	Zachar 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	
	Sitkinak Lagoon	purse seine			X	
	Cape Igvak Section	purse seine	X			
	Mainland District	purse seine			X	
M.V. Coho						
	Zachar Bay	purse seine			X	
	Chiniak Beach	purse seine			X	

Appendix E. Kodiak Managment Area salmon run data, 1977 to 1986.[a]

		Species (Number of fish)					
		Kings	Sockeye	Coho	Pinks	Chum	Total
1977	Catch	585	623,486	27,920	6,252,405	1,072,313	7,976,691
	Index. Esc.[b]	13,794	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	1,714,697	12,274,422
1978	Catch	3,228	1,071,782	48,795	15,004,065	814,345	16,942,215
	Index. Esc.[b]	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	149,629	11,287,591	358,400	12,420,260
	Index. Esc.[b]	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	19,157,249
	Index. Esc.[b]	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	13,056,892
	Index. Esc.[b]	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	10,891,952
	Index. Esc.[b]	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	7,081,982
	Index. Esc.[b]	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	13,678,205
	Index. Esc.[b]	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	9,897,903
	Index. Esc.[b]	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	4,381	3,188,269	168,673	11,808,275	1,134,558	16,304,156
	Index. Esc.[b]	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 Run		16,874	2,954,676	260,265	14,202,880	1,655,159	19,089,854

[a] Ken Manthey, 1986. 1986 Kodiak Management Area salmon and herring report to the Alaska Board of Fisheries.

[b] Indexed escapements based on peak aerial and foot surveys of index streams combined with escapement enumerated at systems with weirs.

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