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Alaska Department of Fish and Game
Commercial Fisheries Management
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Kodiak Management Area Salmon Catch, Escapement, and Run Statistics, 1988

by

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ABSTRACT

The 1988 Kodiak Management Area (KMA) commercial salmon catch was 19,008,716 fish, which was composed of 22,373 chinook *Oncorhynchus tshawytscha*, 2,698,861 sockeye *O. nerka*, 303,264 coho *O. kisutch*, 14,558,680 pink *O. gorbuscha*, and 1,425,538 chum salmon *O. keta*. This catch was about 1.8 times greater than the 1968–1987 average catch and 1.6 times larger than the even-year 1968–1986 average catch. The highest catches occurred within the Northwest Kodiak (8,085,898) and Afognak (3,496,860) Districts; pink salmon dominated the harvest in most districts. The largest sockeye catches occurred within the Alitak Bay (1,100,000), Southwest Kodiak (400,000), and Northwest Kodiak (400,000) Districts. Of the total KMA sockeye catch, an estimated 700,000 were Upper Cook Inlet fish and 27,000 fish were of Chignik origin. Total estimated escapements included 35,142 chinook, 1,739,232 sockeye, 118,449 coho, 5,762,167 pink, and 774,997 chum salmon. Most of the pink salmon escapement was into Northeast Kodiak, Southwest Kodiak, and Northwest Kodiak District streams. The KMA sockeye run was about 4,400,000 fish; the predominate age class in both the catch and escapement was age 2.2 (1983 brood year). A majority of the KMA chum salmon catch was age 0.3 (>30%) and age 0.4 (>60%); predominate age classes for coho salmon escapements were age 1.1 (>10%; range 12.5%–78.0%) and age 2.1 (>20%; range 22.0%–75.0%).

KEY WORDS: Pacific salmon, *Oncorhynchus*, Kodiak, catch, escapement, run, age

INTRODUCTION

The Kodiak Management Area (KMA) encompasses the entire Kodiak Archipelago and that portion of the Alaska Peninsula draining into Shelikof Strait from Cape Douglas to Kilokak Rocks bordering Imuya Bay. The archipelago and Alaska Peninsula portions of the management area are each about 241 km in length, while Shelikof Strait, which separates the two, averages 48 km in width (Figure 1).

The KMA is composed of 7 districts and 52 sections that include 440 known salmon streams (Figure 2). Emphasis of the management program is to achieve biological escapement goals while ensuring local stock surpluses are harvested in an orderly fashion. Five species of salmon are harvested within the KMA, all of which have established biological escapement goals. These goals are 11,000–19,000 chinook *Oncorhynchus tshawytscha*, 90,000–290,000 coho *O. kisutch*, 1,480,000–2,380,000 sockeye *O. nerka*, 2,400,000–6,000,000 pink *O. gorbuscha* (even year; indexed escapement counts), and 500,000–1,500,000 chum *O. keta* salmon (Brennan et al. 1992). Directed fisheries occur on sockeye, pink, chum, and coho salmon; chinook salmon are not targeted. To open and close the fishery inseason, managers employ qualitative analysis of run timing, catch per unit effort, species composition of catch, regulatory management plans, and aerial survey and weir escapement counts.

Three gear types are permitted within the KMA: purse seine, beach seine, and set gillnet. The Mainland, Afognak, Eastside Kodiak, Northeast (NE) Kodiak, and Southwest (SW) Kodiak Districts are exclusively purse and beach seining areas (Figure 2). All three gear types are legally permitted within the Central Section of the Northwest (NW) Kodiak District. For the Alitak Bay District all three gear types are allowed: purse and beach seine gear within the Cape Alitak and Humpy-Deadman Sections and set gillnet gear in the Moser-Olga Section. By regulation purse seining and beach seining are allowed within the Moser-Olga Section after 5 September.

The Alaska Board of Fisheries has approved KMA salmon management plans for the Cape Igvak Section of the Mainland District and the Alitak Bay District (ADF&G 1988). The Cape Igvak plan allows the harvest of Chignik-bound sockeye salmon within the Cape Igvak Section and assumes about 80% of the sockeye harvested within this area originate from Chignik Management Area systems (ADF&G 1988). The Alitak Bay District plan was adopted to promote local stock management and maintain traditional allocations between gear user groups.

This report summarizes Kodiak Management Area catch, escapement, and run statistics by species and stock where applicable; previous reports providing similar data for the KMA include Holmes and Monkiewicz (1988) and Holmes (1990, 1991). Management of the Kodiak salmon resource requires knowledge of the biological characteristics (age, size, and sex composition) of the various runs subjected to commercial exploitation, and preseason run forecasts and escapement goal evaluations are founded upon accurate assignment of the runs (run reconstruction) to stock of origin. Such information is but one avenue for allowing the continued evolution of this complex management program necessary to satisfy increasing demands upon area salmon resources.

METHODS

Catch Estimation

Kodiak area salmon catch numbers by species, date, statistical week (0001 hours Sunday to 2400 hours the following Saturday; Table 1), district, and section for the 1988 season were obtained from summary reports of individual harvest receipts (fish tickets). The fish ticket database was edited by Kodiak area salmon management biologists prior to summary reports being generated. Sport fishing catch numbers were obtained from Mills (1989) and subsistence catch numbers from Malloy and Prokopowich (1992).

Escapement Enumeration and Estimation

Salmon escapements within the KMA during 1988 were counted through weirs on 15 systems. Operational dates for the 4 major systems (Karluk, Ayakulik, Frazer Lake-Dog Salmon, and Upper Station) occurred from late May through mid September, except the Ayakulik weir, which ceased operation in late August. Estimating sockeye escapements for non-weired systems was accomplished by multiplying peak aerial survey counts by an expansion factor of 2.0 (Barrett et al. 1985).

Attempts to quantify coho escapements after weirs were removed were limited to visual estimates of fish in terminal brackish water areas. For systems without weirs, peak aerial or foot survey counts of coho salmon were expanded by a factor of 2.4, derived using data presented in Minard (1986).

A large proportion of pink and chum salmon escapements were enumerated via aerial and foot surveys for a select number of escapement index streams. Pink and chum salmon index streams for which there were greater than one aerial or foot survey, coupled with stream life estimates of 15 d (Swanton et al. 1993; Barrett et al. 1990), were incorporated into an area-under-the-curve spawner abundance model (Johnson and Barrett 1988). This model provided pink and chum salmon total escapement estimates. For systems with only a single survey count, expansion factors of 1.90 for pink salmon and 1.27 for chum salmon were employed; these were derived by dividing that proportion of estimated total escapement by peak count (Barrett et al. 1990). Estimates of pink salmon escapement into streams not surveyed during 1988 were derived using the method of Barrett et al. (1990).

Age, Length, and Sex Sampling

A single scale per fish was collected from sockeye and chum salmon catches and escapements; two scales per fish were obtained from selected coho salmon escapements. Focus of the catch and escapement scale sampling program was primarily sockeye salmon. Age designation rules used were those reported by Narver (1963) and Swanton (1992). Reporting of age information employed European notation: the number of freshwater annuli, then marine annuli separated by a decimal point (Koo 1962).

Scale sampling and preparation procedures were adaptations of those described by INPFC (1963) and Clutter and Whitesel (1956). Fish lengths, mid-eye to fork-of-tail, when measured, were recorded to the nearest millimeter. Sockeye salmon mean length was estimated by age class, along with standard error of each estimate. Determination of sex was via examination of external morphological characteristics.

During the fisheries, catch samples were usually collected weekly for each district. Escapement age, length, and sex (ALS) samples were also obtained weekly at weir sites. Catch sample sizes were 600 scales per district and statistical week; and per system escapement sample sizes were 240 scales and lengths per statistical week. For some systems (i.e., Uganik, Afognak, Akalura, Silver Salmon, and Saltery) an attempt was made to collect 600 ALS samples at or near the peak of the escapement employing a beach seine in terminal brackish water or lake spawning areas. Attempts were made to collect escapement samples to meet the required sample size within 2 consecutive days. The catch sample size enabled all age classes to be simultaneously estimated at $\alpha = 0.05$ within $\pm 4.0\%$ of the true proportions; the escapement sample size enabled all age classes to be simultaneously estimated at $\alpha = 0.10$ within $\pm 6.5\%$ of the true proportions (Thompson 1987).

Escapement counts and catch numbers for selected areas and systems were stratified by age, sex, and day using linear interpolation between weekly sampling events. Length compositions were reported by age, sex, week, and escapement system sampled.

RESULTS

The total KMA salmon catch during 1988 was 19,063,124 fish, of which 19,008,716 were caught commercially, 39,270 by sport fishers, and 15,138 by subsistence fishers. The commercial catch was 76.6% (14,500,000) pink, 14.2% (2,700,000) sockeye, 7.5% (1,400,000) chum, 1.6% (300,000) coho, and <1.0% (22,373) chinook salmon. The catch was 0.9 times above the 20-year average (1968–1987) and 3.5 times greater than the 5-year (1983–1987) average (Table 2). There were 19,062 landings (Table 3) and 524 limited entry permits fished: 323 purse seine, 21 beach seine, and 180 set gillnet (Malloy and Prokopowich 1992). Most of the catch occurred within the NW Kodiak (42.5%), Afognak (18.4%), and Mainland (13.2%) Districts (Table 4). Peak catches for all species occurred between 13 July and 17 August (Figure 3).

Chinook Salmon

The estimated total chinook run was 58,551 fish (Table 5). A total of 23,409 chinook salmon were harvested in all fisheries during 1988. Most of the catch was taken by commercial fishers (22,373 fish; 95.5%), while 928 fish were caught by sport and 108 by subsistence fishers. The commercial catch was 10.5 times greater than the 20-year (1968–1987) and 4.8 times greater than the 5-year (1983–1987) averages. Most of the chinook harvest occurred within the Mainland, NW Kodiak, and SW Kodiak

averages. Most of the chinook harvest occurred within the Mainland, NW Kodiak, and SW Kodiak Districts (Table 5). Average fish weight was 13.2 lbs (Table 3). Peak catches occurred on 10 June and 12 July within the NW Kodiak and Mainland Districts (Swanton and Nelson 1993).

A total of 35,013 chinook salmon were counted through weirs, and an additional 129 chinook salmon were estimated via aerial surveys (Table 4; Appendix A). Approximately 99% of the estimated total escapement occurred in the Ayakulik and Karluk River systems.

Sockeye Salmon

During 1988 a total of 2,700,000 sockeye salmon were harvested, 2,698,861 fish via commercial gear. This harvest was 2.7 times greater than the 20-year average and 1.3 times greater than the 5-year average of 900,000 fish (Table 2). A majority (75.1% or 2,026,680 fish) of the catch was from the Alitak, SW Kodiak, and NW Kodiak Districts (Table 5; Figure 4). The central 50% of the catch for these districts occurred 12 July through 12 August in the Alitak Bay District, 25 June through 19 July in the SW Kodiak District, and 11–30 July in the NW Kodiak District (Swanton and Nelson 1993). A majority (68%) of the sockeye salmon was harvested by purse seine gear, the balance caught with set gillnets (Malloy and Prokopowich 1992). Scales for age determination were collected within catch areas that had a combined harvest of 1,600,000 or 59.2% of the overall catch (Table 6); 24,992 fish were sampled. The catch was predominately age-2.2 (42.3%; 1983 brood year), age-0.2 (17.4%; 1985 brood year), and age-1.3 (17.0%; 1983 brood year) fish. Average sockeye weight was 5.7 lbs (Table 3). In addition to the commercial harvest, 4,875 fish were caught by sport and 9,942 by subsistence fishers.

The 1988 catch of sockeye salmon was about 900,000 fish greater than the preseason forecasts of Malloy and Prokopowich (1992). About 700,000 of the harvest total was estimated to be of Cook Inlet origin (Malloy 1989). Barrett (1989) estimated that about 500,000 Cook Inlet-bound sockeye salmon were harvested within the Northwest and Southwest Sections of the Afognak District and the Big River, Kukak, and Dakavak Sections of the Mainland District. In addition, an estimated 27,682 sockeye of Chignik origin were harvested within the Cape Igvak Section of the Mainland District (Barrett and Thompson 1991).

A total of 1,700,000 sockeye salmon were counted as escapement through weirs (90%) and estimated via aerial and foot survey counts (10%). Biological escapement goals for these systems total 1,600,000 to 1,900,000; the lower end of the escapement goal range was met for all weired systems (Malloy and Prokopowich 1992). A majority (>75%) of the sockeye escapements occurred within the SW Kodiak and Alitak Bay Districts. Weir escapements presented as cumulative percent by day are shown in Figure 5. Overall, scale and length samples were collected from 19,252 fish (Table 7). Most of the sockeye escapements were age 2.2 (44.3%; 1983 brood year), age 2.3 (14.6%; 1982 brood year), and age 1.2 (9.6%; 1984 brood year; Table 7). Estimated age, length, and sex compositions of selected escapements are reported in Tables 7–9.

The 1988 KMA-estimated sockeye run was 4,400,000 fish; most of the run (>65%) was to the Alitak Bay and SW Kodiak Districts (Table 5). Sockeye runs by district were 1,700,000 for Alitak Bay, 1,300,000 for SW Kodiak, 400,000 for NW Kodiak, 300,000 for both Afognak and Mainland, 100,000 for Eastside Kodiak, and 28,000 for NE Kodiak. Total run numbers stratified by early and late (i.e., through and post 15 July) are reported in Malloy and Prokopowich (1992). Run numbers estimated using scale pattern analysis for Alitak Bay District stocks are reported in Swanton (1992).

Coho Salmon

The total coho harvest was 322,245 fish, of which 303,264 (94%) were caught commercially, 15,279 (4.7%) by sport fishers, and 3,702 (1.1%) by subsistence users (Table 5). The commercial harvest was 3.0 times greater than the 20-year (1968–1987) average of 105,800 and 1.6 times larger than the 5-year (1983–1987) average of 206,400 fish (Table 2). Of the commercial catch, purse seine fishers harvested 88.0% and set gillnet fishers 12% (Malloy and Prokopowich 1992). The largest harvests were in the NW Kodiak 95,000 (32.2%), Afognak 79,636 (27.0%), and Mainland 54,764 (18.6%) Districts (Table 5). The central 50% of the catch occurred between 1–19 August in the NW Kodiak, 3–18 August in the Afognak, and 4–17 August in the Mainland Districts (Swanton and Nelson 1993). Average weight of coho salmon harvested was 8.5 lbs (Table 3).

The estimated minimum total coho salmon escapement was 118,449 fish (Figure 6). There were 80,205 fish counted at weirs and 36,844 estimated from aerial and foot survey counts (Table 5). Most of the escapement was in the SW Kodiak (44,759) and Afognak (35,228) Districts (Table 4). Escapement counts derived via weir and aerial and foot surveys were not complete counts due to weirs being dismantled and aerial and foot surveys discontinued prior to completion of the coho run (Swanton and Nelson 1993). Dominant age classes from selected escapements were age 1.1 and 2.1; age composition of selected coho salmon escapements sampled during 1988 are reported in Swanton and Nelson (1993).

The estimated KMA total coho salmon run for 1988 was 440,000 fish, composed of 303,264 harvested and a minimum escapement of 118,449 (Table 5). Coho runs to the Afognak, NW Kodiak, Mainland, and SW Kodiak Districts collectively accounted for >70% of the total KMA run.

Pink Salmon

The commercial pink salmon catch was 14,558,680 fish (including 296,699 for Kitoi Bay cost recovery). This was 1.5 times greater than the 1968–1986 even-year average of 9,976,300 fish. Purse seiners harvested 82%, beach seiners 2%, and set gillnetters 16% of the catch (Malloy and Prokopowich 1992). The NW Kodiak and Afognak fishing Districts accounted for 69.1% of the catch (Table 5). The central 50% of the catch occurred from 28 July through 12 August in the NW Kodiak and 31 July through 13 August in the Afognak Districts (Swanton and Nelson 1993). Average weight of commercially caught pink salmon was 3.8 lbs (Table 3). Sport (17,115) and subsistence (1,127) harvests combined represented <1.0% of the overall pink catch (Table 5).

Estimated total escapement was 4,800,707 pink salmon, of which 1,615,871 were counted through weirs, 3,004,563 were estimated from aerial and foot survey counts (Appendix A.1), and 180,273 were estimated for systems not surveyed. Biological escapement goals were met in most systems with weirs.

The 1988 pink salmon run was 19,300,000; a majority (>70%) of the total run was to the NW Kodiak, Afognak, and Mainland Districts (Table 5).

Chum Salmon

The total chum salmon catch during 1988 was 1,426,870 fish. The commercial harvest of 1,425,538 fish was the second largest within the last 20 years; sport fishers caught 1,073 fish and subsistence users 259. The commercial harvest was about 1.8 times greater than both the 20-year (1968–1987) and 5-year average catches (Table 2). Purse seiners harvested 85.0%, set gillnetters 13.0%, and beach seiners 2.0% of the total (Malloy and Prokopowich 1992) catch. Of the entire catch, most was taken in the NW Kodiak (37.6%), Mainland (27.5%), and Eastside Kodiak (15.1%) Districts (Table 5). The central 50% of the catch for these districts occurred during 8 July through 2 August in the NW Kodiak, 25 July through 10 August in the Mainland, and 20 July through 10 August in the Eastside Kodiak (Swanton and Nelson 1993) Districts. Average weight for commercially caught chum salmon was 8.9 lbs (Table 3).

The major age classes present within the chum salmon catch sampled during 1988 were age 0.3 (>20%) and age 0.4 (>60%; Table 10). Predominate age classes of chum salmon captured for Kitoi Bay Hatchery brood stock were age 0.3 (23%) and 0.4 (75%; Table 11). Length and sex composition of this catch are presented in Tables 12–13.

Estimated total areawide chum salmon escapement was 774,997 fish, of which 31,101 were counted through weirs and 743,896 were minimally estimated from aerial and foot survey counts. Of the total number of chum salmon counted via weirs, 30,683 were enumerated through the Dog Salmon weir within the Alitak Bay District. Most of the estimated minimum chum salmon escapement was in the NW Kodiak (32%), Mainland (31%), and NE Kodiak (12%) District streams (Table 5). Escapements into streams not surveyed by air or foot during 1988 were not estimated.

The 1988 total chum salmon run was 2,201,867, of which 1,425,538 fish were harvested and a minimum of 774,997 were estimated as escapement. The balance were harvested by sport and subsistence fishers. A majority (>75%) of the total chum run was to the NW Kodiak, Mainland, and Eastside Kodiak Districts.

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Table 1. Statistical weeks and associated calendar dates, 1988.

Statistical Week	Calendar Date	Statistical Week	Calendar Date
1	01 Jan to 02 Jan	28	03 Jul to 09 Jul
2	03 Jan to 09 Jan	29	10 Jul to 16 Jul
3	10 Jan to 16 Jan	30	17 Jul to 23 Jul
4	17 Jan to 23 Jan	31	24 Jul to 30 Jul
5	24 Jan to 30 Jan	32	31 Jul to 06 Aug
6	31 Jan to 06 Feb	33	07 Aug to 13 Aug
7	07 Feb to 13 Feb	34	14 Aug to 20 Aug
8	14 Feb to 20 Feb	35	21 Aug to 27 Aug
9	21 Feb to 27 Feb	36	28 Aug to 03 Sep
10	28 Feb to 05 Mar	37	04 Sep to 10 Sep
11	06 Mar to 12 Mar	38	11 Sep to 17 Sep
12	13 Mar to 19 Mar	39	18 Sep to 24 Sep
13	20 Mar to 26 Mar	40	25 Sep to 01 Oct
14	27 Mar to 02 Apr	41	02 Oct to 08 Oct
15	03 Apr to 09 Apr	42	09 Oct to 15 Oct
16	10 Apr to 16 Apr	43	16 Oct to 22 Oct
17	17 Apr to 23 Apr	44	23 Oct to 29 Oct
18	24 Apr to 30 Apr	45	30 Oct to 05 Nov
19	01 May to 07 May	46	06 Nov to 12 Nov
20	08 May to 14 May	47	13 Nov to 19 Nov
21	15 May to 21 May	48	20 Nov to 26 Nov
22	22 May to 28 May	49	27 Nov to 03 Dec
23	29 May to 04 Jun	50	04 Dec to 10 Dec
24	05 Jun to 11 Jun	51	11 Dec to 17 Dec
25	12 Jun to 18 Jun	52	18 Dec to 24 Dec
26	19 Jun to 25 Jun	53	25 Dec to 31 Dec
27	26 Jun to 02 Jul		

Table 2. Salmon catch numbers by species and year, Kodiak Management Area, 1968–1988^a.

Year	Commercial Catch					Total
	Chinook	Sockeye	Coho	Pink	Chum	
1968	2,000	760,000	56,000	8,761,000	750,000	10,329,000
1969	2,000	604,000	35,000	12,493,000	537,000	13,671,000
1970	1,000	917,000	66,000	12,045,000	919,000	13,949,000
1971	1,000	478,000	23,000	4,333,000	1,541,000	6,376,000
1972	1,000	222,000	14,000	2,486,000	1,165,000	3,888,000
1973	1,000	167,000	4,000	512,000	318,000	1,002,000
1974	1,000	409,000	14,000	2,635,000	248,000	3,307,000
1975		137,000	25,000	2,945,000	85,000	3,192,000
1976	1,000	641,000	24,000	11,078,000	740,000	12,484,000
1977	1,000	623,000	28,000	6,252,000	1,072,000	7,976,000
1978	3,000	1,072,000	49,000	15,004,000	814,000	16,942,000
1979	2,000	632,000	141,000	11,287,000	358,000	12,420,000
1980	1,000	651,000	139,000	17,290,000	1,076,000	19,157,000
1981	1,000	1,289,000	122,000	10,337,000	1,345,000	13,094,000
1982	1,000	1,205,000	344,000	8,076,000	1,266,000	10,892,000
1983	4,000	1,232,000	158,000	4,603,000	1,085,000	7,082,000
1984	5,000	1,951,000	230,000	10,884,000	649,000	13,719,000
1985	5,000	1,843,000	284,000	7,335,000	431,000	9,898,000
1986	4,000	3,155,000	168,000	11,504,000	1,126,000	15,957,000
1987	5,000	1,793,000	192,000	5,073,000	682,000	7,745,000
1988	22,000	2,698,000	295,000	14,559,000	1,426,000	19,002,000
<hr/>						
<i>Average</i>						
1968–87	2,100	989,050	105,800	8,246,650	810,350	10,154,000
<i>Average</i>						
1983–87	4,600	1,994,000	206,400	7,879,800	794,600	5,440,100
<i>Odd Year – Average</i>						
1969–87				6,517,000		8,245,600
<i>Even Year – Average</i>						
1968–86				9,976,300		12,062,400

^a Catch data from Malloy and Prokopowich (1992) and originally obtained from the ADF&G fish ticket database.

Table 3. Salmon commercial catch numbers and weight in pounds, by district and gear type, Kodiak Management Area, 1988.

District (gear) Section	Permits	Landings	Commercial Catch Number														
			Chinook			Sockeye			Coho			Pink			Chum		
			No.	Lb.	Avg. Wt.	No.	Lb.	Avg. Wt.	No.	Lb.	Avg. Wt.	No.	Lb.	Avg. Wt.	No.	Lb.	Avg. Wt.
Afognak (Purse Seine)																	
Southwest Afognak	163	726	1,721	26,304	15.3	96,465	682,752	7.1	26,826	220,751	8.2	1,119,786	4,101,191	3.7	44,670	392,668	8.8
Northwest Afognak	123	373	299	4,627	15.5	131,296	953,352	7.3	8,447	74,870	8.9	404,959	1,535,014	3.8	20,158	183,658	9.1
Shuyak Island	75	126	112	1,932	17.3	56,884	419,017	7.4	3,792	29,141	7.7	62,900	227,559	3.6	11,255	101,517	9.0
Perenosa	31	145	34	481	14.2	1,388	7,270	5.2	20,865	173,836	8.3	342,729	1,388,525	3.9	1,166	9,290	8.0
Northeast Afognak	16	24	13	159	12.2	2,126	12,801	6.0	2,515	21,630	8.6	77,884	280,122	3.6	1,819	14,401	7.9
Izhut Bay	57	103	3	41	13.7	76	379	5.0	2,134	19,201	9.0	114,174	420,320	3.7	361	3,181	8.8
Kitoi Bay	a	a	0	0		51	267	5.2	150	1,514	10.1	1,756	6,206	3.5	23	160	7.0
Duck Bay	57	131	20	737	36.9	4,800	29,758	6.2	5,813	49,185	8.5	281,137	965,429	3.4	3,617	27,932	7.7
Southeast Afognak	52	169	40	615	15.4	3,488	19,346	5.6	8,994	74,604	8.3	309,805	1,131,288	3.7	4,507	35,247	7.8
Subtotal	237	1,797	2,242	34,896	15.6	296,574	2,124,942	7.2	79,536	664,732	8.4	2,715,130	10,005,654	3.7	87,576	768,054	8.8
Afognak (Beach Seine)																	
Southwest Afognak	a		0	0		2	9	4.5	15	143	9.5	5,061	18,602	3.7	75	554	7.4
Northwest Afognak	a		0	0		124	496	4.0	54	442	8.2	12,686	45,353	3.6	64	591	9.2
Perenosa	a		0	0		0	0		0	0		657	2,444	3.7	0	0	
Northeast Afognak	a		1	28	28.0	8	54	6.8	0	0		3	9	3.0	162	1,145	7.1
Subtotal		16	1	28	28.0	134	559	4.2	69	585	8.5	18,407	66,408	3.6	301	2,290	7.6
Kitoi Bay Hatchery (Cost Recovery)		16				158	995	6.3	31	206	6.6	296,699	1,049,824	3.5	2	18	9.0
District Total	237	1,829	2,243	34,924	15.6	296,866	2,126,496	7.2	79,636	655,523	8.2	3,030,236	11,171,886	3.7	87,879	770,362	8.8
Northwest Kodiak (Purse Seine)																	
Central/Terror Bay	264	3,494	4,706	65,045	13.8	179,714	1,142,307	6.4	49,675	423,281	8.5	4,191,476	15,875,756	3.8	311,493	2,934,968	9.4
N Cape/Sheratin Bay	127	748	419	4,038	9.6	34,075	193,999	5.7	20,556	161,203	7.8	776,505	2,836,786	3.7	64,907	563,606	8.7
Subtotal	272	4,242	5,125	69,083	13.5	213,789	1,336,306	6.3	70,231	584,484	8.3	4,967,981	18,712,542	3.8	376,400	3,498,574	9.3
Northwest Kodiak (Beach)																	
Central/Terror Bay	15	278	23	464	20.2	1,368	8,316	6.1	140	1,189	8.5	118,076	463,023	3.9	8,49	79,189	9.3
N Cape/Sheratin Bay	a	4	1	6	6.0	8	37	4.6	10	98	9.8	884	3,010	3.4	153	1,285	8.4
Subtotal	15	282	26	470	19.6	1,376	8,353	6.1	150	1,287	8.6	118,960	466,033	3.9	8,643	80,474	9.3
Northwest Kodiak (Set Gillnet)																	
Central/Terror Bay	97	4,793	1,015	17,255	17.0	190,584	1,139,481	6.0	22,702	202,856	8.9	1,791,577	7,089,353	4.0	134,920	1,094,742	8.1
N Cape/Sheratin Bay	7	268	48	823	17.2	12,381	73,445	5.9	1,917	15,675	8.2	151,582	578,314	3.8	16,491	130,037	7.9
Subtotal	104	5,061	1,063	18,078	17.0	202,965	1,212,926	6.0	24,619	218,531	8.9	1,943,159	7,667,667	3.9	151,411	1,224,779	8.1
District Total	391	9,585	6,214	87,631	14.1	418,130	2,557,585	6.1	95,000	804,302	8.5	7,030,100	26,846,242	3.8	536,454	4,803,827	8.9

- Continued -

Table 3. (Page 2 of 3).

District (gear) Section	Permits	Landings	Commercial Catch Number														
			Chinook			Sockeye			Coho			Pink			Chum		
			No.	Lb.	Avg. Wt.	No.	Lb.	Avg. Wt.	No.	Lb.	Avg. Wt.	No.	Lb.	Avg. Wt.	No.	Lb.	Avg. Wt.
Southwest Kodiak (Purse Seine)																	
Outer Karluk	39	93	62	1,151	18.6	10,997	70,282	6.4	153	1,248	8.2	182,962	681,661	3.8	4,703	41,206	8.8
Inner Karluk	7	13	2	58	29.0	1,281	8,391	6.6	90	938	10.4	25,190	95,646	3.8	365	3,303	9.1
Sturgeon	6	6	74	605	8.2	2,586	13,698	5.3	91	808	8.9	4,034	15,968	4.0	470	3,982	8.5
Halibut Bay	158	833	1,208	15,486	12.8	336,074	1,836,982	5.5	7,922	66,444	8.4	195,256	711,137	3.6	19,085	169,476	8.9
Inner/Outer Ayakulik	157	419	2,562	50,283	19.6	132,204	640,619	4.9	10,910	110,850	10.2	10,492	36,722	3.5	4,041	37,526	9.3
Subtotal	208	1,364	3,908	67,583	17.3	483,142	2,569,972	5.3	19,166	180,288	9.4	417,934	1,541,134	3.7	28,664	255,493	8.9
Southwest Kodiak (Beach Seine)																	
Halibut Bay	4	9	2	49	24.5	966	1,366	5.0	97	908	9.4	754	2,775	3.7	2	25	12.5
Subtotal	5	11	5	89	22.2	1,335	1,881	5.1	97	908	9.4	1,581	5,763	3.6	6	48	8.0
District Total	213	1,375	3,913	67,672	17.3	484,477	2,571,853	5.3	19,263	181,196	9.4	419,515	1,546,897	3.7	28,670	255,541	8.9
Alltak Bay (Purse Seine)																	
Cape Alitak	117	1,066	527	11,806	22.4	444,673	2,196,964	4.9	18,091	170,356	9.4	234,699	910,767	3.9	45,269	382,544	8.5
Moser-Olga Bay	12	14	20	315	15.8	5,188	25,956	5.0	217	2,073	9.6	4,098	15,925	3.9	1,724	14,718	8.5
Humpy-Deadman	31	101	11	230	20.9	20,661	117,438	5.7	362	3,028	8.4	12,914	45,878	3.6	13,495	122,825	9.1
Subtotal	121	1,181	558	12,351	22.1	470,522	2,340,358	5.0	18,670	175,457	9.4	251,711	972,570	3.9	60,488	520,087	8.6
Alltak Bay (Beach Seine)																	
Subtotal						7	20	2.9				177	587	3.3	205	1,538	7.5
Alltak Bay (Set Gillnet)																	
Moser-Olga	87	2,438	66	1,520	23.0	586,769	3,027,036	5.2	10,083	97,919	9.7	130,840	538,685	4.1	32,419	270,766	8.4
In/Out Akalura	38	265	66,775	329,592	4.9	1,225	12,276	10.0	2,983	12,052	4.0	269	2,312	8.6			
Subtotal	87	2,703	66	1,520	23.0	653,544	3,356,628	5.2	11,308	110,195	9.7	133,823	550,737	4.1	32,688	273,078	8.4
District Total	202	3,884	624	13,871	22.2	1,124,073	5,696,986	5.1	29,978	285,652	9.5	385,711	1,523,307	3.9	93,381	793,165	8.5
Eastside Kodiak (Purse Seine)																	
Seven Rivers	26	179	1	28	28.0	1,270	5,646	4.5	693	6,206	9.0	676,334	2,480,962	3.7	5,106	35,701	7.0
Two Headed	16	49	11	304	22.2	2,843	15,814	6.6	2,085	18,200	7.3	125,355	478,896	3.8	7,280	58,197	7.4
Sitkalidak	64	691	302	6,225	20.6	57,602	369,159	6.4	16,830	138,315	8.2	684,957	2,672,075	3.9	162,981	1,429,907	8.8
Inner/Outer Ugak	34	116	1,328	18,959	14.3	13,702	82,880	6.1	845	8,451	10.0	14,686	53,603	3.7	36,429	340,702	9.4
Subtotal	96	731	1,600	24,368	15.2	75,417	441,627	6.4	12,204	97,829	8.0	1,501,332	3,855,572	3.7	211,796	1,430,141	8.9
Eastside Kodiak (Beach Seine)																	
Seven Rivers	4	32				40	174	4.4	22	179	8.1	21,626	78,767	3.6	2,023	14,126	7.0

- Continued -

Table 3. (Page 3 of 3).

District (gear) Section	Permits	Landings	Commercial Catch Number														
			Chinook			Sockeye			Coho			Pink			Chum		
			No.	Lb.	Avg. Wt.	No.	Lb.	Avg. Wt.	No.	Lb.	Avg. Wt.	No.	Lb.	Avg. Wt.	No.	Lb.	Avg. Wt.
Eastside Kodiak (Beach Seine)																	
Subtotal	6	43	1	30	30.0	153	831	5.4	41	321	7.8	24,121	88,483	3.7	3,524	26,993	7.7
District Total	102	774	1,642	24,398	15.2	75,570	442,458	6.4	20,494	98,150	8.0	1,525,453	3,944,055	3.7	215,320	1,457,134	8.8
Northeast Kodiak (Purse Seine)																	
Outer Chiniak	44	124	48	969	20.2	295	1,506	5.1	1,694	17,409	10.3	125,343	471,928	3.8	20,538	193,461	9.4
Inner Chiniak	50	101	30	540	18.0	71	417	5.9	1,405	12,312	8.8	54,780	204,394	3.7	28,158	264,551	9.4
Buskin River	36	89	6	120	20.0	87	576	6.6	251	2,418	9.6	106,737	406,887	3.8	16,110	139,033	8.6
Monashka/Mill Bay	26	44	6	104	17.3	244	1,557	6.4	319	2,832	8.9	89,121	331,279	3.7	3,616	35,111	9.7
Subtotal	90	358	90	1,733	19.3	697	4,056	5.8	3,669	34,971	9.5	375,981	1,414,488	3.8	68,422	632,156	9.2
Northeast Kodiak (Beach Seine)																	
Inner Chiniak	5	72	44	686	15.6	26	118	4.5	457	3,734	8.2	31,174	110,955	3.6	1,956	18,528	9.5
Subtotal	5	95	45	699	15.5	34	153	4.5	460	3,755	8.2	43,264	155,174	3.6	3,258	30,795	9.5
District Total	95	453	135	2,432	18.0	731	4,209	5.7	4,129	38,726	9.4	419,245	1,569,662	3.7	71,680	662,951	9.2
Mainland (Purse Seine)																	
Big River	27	40	133	1,348	10.1	6,360	41,936	6.6	4,274	34,149	8.0	19,382	72,390	3.7	28,628	250,912	8.8
Hallo Bay	11	15	21	186	8.9	1,214	9,798	8.1	756	6,600	8.7	4,617	18,197	3.9	10,951	100,140	9.1
Outer Kukak	41	73	93	802	8.6	6,653	31,671	4.8	350	2,989	8.5	7,633	29,393	3.9	53,652	466,473	8.7
Inner Kukak	50	94	15	220	14.7	81	487	6.0	245	1,913	7.8	16,131	60,627	3.8	84,652	758,633	9.0
Dakavak	113	394	5,882	44,371	7.5	221,516	1,539,709	7.0	5,823	43,640	7.5	193,923	758,204	3.9	82,498	741,937	9.0
Katmai	7	9	115	1,408	12.2	7,395	49,253	6.7	19	156	8.2	731	3,082	4.2	3,120	29,257	9.4
Alinchak	87	524	1,343	15,254	11.4	55,793	357,293	6.4	43,254	331,555	7.7	1,478,589	5,562,451	3.8	123,558	1,106,724	9.0
Subtotal	167	1,149	7,602	63,589	8.4	299,012	2,030,147	6.8	54,721	421,002	7.7	1,721,006	6,504,344	3.8	387,059	3,454,076	8.9
Mainland (Beach)																	
Subtotal	2	13	0	0		2	13	6.5	43	286	6.7	27,414	107,131	3.9	5,095	47,738	9.4
District Total	169	1,162	7,602	63,589	8.4	299,014	2,030,160	6.8	54,764	421,288	7.7	1,748,420	6,611,475	3.8	392,154	3,501,814	8.9
Kodiak Management Area																	
Total		19,062	22,373	294,517	13.2	2,698,861	15,429,747	5.7	303,264	2,484,837	8.4	14,558,680	53,213,524	3.8	1,425,538	12,244,794	8.9

Table 4. Salmon escapements counted through weirs by district and stream, Kodiak Management Area, 1988.

District Stream	Salmon Species					Total
	Chinook	Sockeye	Coho	Pink	Chum	
Afognak						
Afognak	2	39,012	9,772	148,206	11	197,003
Pauls Bay		22,794	5,563	434	3	28,794
Perenosia		26	2,354	56,475		58,855
Thorsheim		4,217	0	0	0	4,217
Carry-Bear	0	0	967	1,241	0	2,208
Big Bay	0	0	2,772	669	0	3,441
Subtotal	2	66,049	21,428	207,025	14	294,518
Southwest Kodiak						
Karluk	13,337	578,816	12,083	711,676	108	1,316,020
Ayakulik	21,370	291,774	19,476	397,409	184	730,213
Subtotal	34,707	870,590	31,559	1,109,085	292	2,046,233
Alitak Bay						
Dog Salmon	303	241,970	3,543	59,489	30,680	335,985
Frazer Lake	212	246,704	0	0	6	246,922
Upper Station	1	306,560	3,813	894	3	311,271
Akalura	1	38,618	6,115	28,010	0	72,744
Silver Salmon	0	0	2,263	75	0	2,338
Subtotal*	305	587,148	15,734	88,468	30,689	722,338
Eastside Kodiak						
Saltery	12	25,654	4,702	7,646	28	38,042
Northeast Kodiak						
Buskin	1	12,144	6,782	203,648	84	222,659
Area Total	35,027	1,561,585	80,205	1,615,872	31,107	3,323,790

* Two weirs exist on the Frazer system (Dog Salmon and Frazer fish pass). The sockeye subtotal excludes the Frazer fish pass counts.

Table 5. Salmon escapement, catch, and total run by district and species, Kodiak Management Area, 1988.

Fishing District	Salmon Species	Escapement			Catch			Total Run
		Surveyed ^a	Weir	Total	Commercial	Sport ^b	Subsistence ^c	
<i>Afognak</i>								
	Chinook		0	0	2,243	36	56	2,335
	Sockeye		66,049	66,049	296,866	346	2,791	366,052
	Coho	13,800	21,428	35,228	79,636	3,420	703	118,987
	Pink	683,620	207,025	890,645	3,030,236	1,765	81	3,922,727
	Chum	645	14	659	87,879		20	88,558
	Subtotal	698,065	294,516	992,581	3,496,860	5,567	3,651	4,498,659
<i>Northwest Kodiak</i>								
	Chinook				6,214		11	6,225
	Sockeye	24,000		24,000	418,130		846	442,976
	Coho				95,000		170	95,170
	Pink	984,595		984,595	7,030,100		116	8,014,811
	Chum	248,271		248,271	536,454		46	784,771
	Subtotal	1,256,866		1,256,866	8,085,898		1,189	9,343,953
<i>Southwest Kodiak</i>								
	Chinook		34,707	34,707	3,913	819	5	39,444
	Sockeye		870,590	870,590	484,477	891	160	1,356,118
	Coho	13,200	31,559	44,759	19,263	309	60	64,391
	Pink	10,165	1,109,085	1,119,250	419,515	36	0	1,538,801
	Chum	82,068	292	82,360	28,670	0	0	111,030
	Subtotal	105,433	2,046,233	2,151,666	955,838	2,055	225	3,109,784
<i>Alitak Bay</i>								
	Chinook		305	305	624		1	930
	Sockeye	24,000	591,395	615,395	1,124,073		1,356	1,740,824
	Coho		15,734	15,734	29,978		46	45,758
	Pink	141,520	88,468	229,988	385,711		19	615,718
	Chum	27,905	30,683	58,588	93,381		19	151,988
	Subtotal	193,425	726,585	920,010	1,633,767		1,441	2,555,218
<i>Eastside Kodiak</i>								
	Chinook	129	0	129	1,642		0	1,771
	Sockeye	42,400	25,654	68,054	75,570		22	143,646
	Coho	6,760	4,702	12,862	20,494		463	33,819
	Pink	253,845	7,645	261,490	1,525,453		400	1,787,343
	Chum	53,957	28	53,985	215,320		37	269,342
	Subtotal	357,091	38,029	396,520	1,838,479		922	2,235,921
<i>Northeast Kodiak</i>								
	Chinook		1	1	135	73	35	244
	Sockeye	7,000	12,144	19,144	731	3,638	4,734	28,247
	Coho	3,084	6,782	9,866	4,129	11,550	2,243	27,788
	Pink	699,018	203,648	902,666	419,245	15,314	511	1,337,736
	Chum	96,468	84	91,452	71,680	1,073	137	164,342
	Subtotal	805,570	222,659	1,023,129	495,920	31,648	7,660	1,558,357

- Continued -

Table 5. (Page 2 of 2).

Fishing District	Salmon Species	Escapement			Catch			Total Run
		Surveyed ^a	Weir	Total	Commercial	Sport ^b	Subsistence ^c	
Mainland								
	Chinook				7,602		0	7,602
	Sockeye	76,000		76,000	299,014		33	375,047
	Coho				54,764		17	54,781
	Pink	231,800		231,800	1,748,420		0	1,980,220
	Chum	239,682		239,682	392,154		0	631,836
	Subtotal	547,482		547,482	2,501,954		50	3,049,486
Total								
	Chinook	129	35,013	35,142	22,373	928	108	58,551
	Sockeye	173,400	1,565,832	1,739,232	2,698,861 ^d	4,875	9,942	4,452,910
	Coho	36,844	80,205	118,449	303,264	15,279	3,702	440,694
	Pink	3,004,563	1,615,871	4,620,434	14,558,680	17,115	1,127	19,197,356
	Chum	748,996	31,101	774,997	1,425,538	1,073	259	2,201,867
All Species Combined		3,963,932	3,328,022	7,288,254	19,008,716	39,270	15,138	25,910,684

^a Survey-derived estimates are aerial and foot survey counts, area-under-the-curve model and 15-day stream life value, or expansion factors cited within text.

^b Sport fisheries catch data from Mills (1989).

^c Subsistence catch data from Malloy and Prokopowich (1992).

^d An estimated 730,000 were destined for Chignik and Cook Inlet systems.

Table 6. Sockeye salmon commercial catch numbers by age and district, Kodiak Management Area, 1988.^a

District Section	Sample Size		Ages										Other ^b	Total
			0.2	0.3	1.2	2.1	1.3	2.2	1.4	2.3	3.2	3.3		
Northwest Kodiak														
Uganik-Viekoda	5,101	Numbers	4,027	5,135	16,264	684	63,084	56,721	1,383	35,617	7,607	1,848	499	192,871
		Percent	2.1	2.7	8.4	0.4	32.7	29.4	0.7	18.5	3.9	1.0	0.3	100.0
Uyak	4,244	Numbers	8,685	9,377	10,326	1,833	36,719	80,816	587	19,878	9,754	496	326	178,795
		Percent	4.9	5.2	5.8	1.0	20.5	45.2	0.3	11.1	5.5	0.3	0.2	100.0
Southwest Kodiak														
Halibut Bay	1,587	Numbers	7,754	11,028	14,552	1,125	97,013	62,239	355	25,041	952	0	0	220,059
		Percent	3.5	5.0	6.6	0.5	44.1	28.3	0.2	11.4	0.4	0.0	0.0	100.0
Ayakulik	1,090	Numbers	728	1,260	12,883	2,874	16,950	86,847		9,489	461	0	712	132,204
		Percent	0.6	1.0	9.7	2.2	12.8	65.7		7.2	0.3	0.0	0.5	100.0
Allak Bay														
Cape Alitak	6,226	Numbers	171,339	31,446	44,245	4,834	44,747	158,694	265	12,153	2,235	0	564	470,522
		Percent	36.4	6.7	9.4	1.0	9.5	33.7	0.1	2.6	0.5	0.0	0.1	100.0
Moser-Olga	6,348	Numbers	131,283	70,913	26,016	2,341	48,506	345,718	187	24,402	3,834	0	344	653,544
		Percent	20.1	10.9	4.0	0.4	7.4	52.9	0.0	3.7	0.6	0.0	0.0	100.0
Mainland														
Cape Igvak	396	Numbers ^c												
		Percent		0.5	15.2	0.5	37.1	15.2		31.6			0.0	100.0
Area Total	24,992	Numbers	308,964	120,734	121,411	13,438	301,409	749,994	2,756	123,689	24,39	2,344	2,407	1,771,537
		Percent	17.4	6.8	6.9	0.8	17.0	42.3	0.2	7.0	1.4	0.1	0.1	100.0

^a Age composition data presented are only for district sections for which commercial catch scale samples were collected during 1988.

^b Other denotes age-1.1, -2.4, and -3.1 fish.

^c Catch numbers were not stratified by age class for these areas owing to the few scale samples collected relative to the commercial harvest.

Table 7. Estimated age composition of selected sockeye salmon escapements by district, Kodiak Management Area, 1988.

District Stream	Sample Size		Ages														Total
			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	
Afognak																	
Thorsheim ^a	33	Percent	0.0	0.0	0.0	0.0	3.0	0.0	6.1	45.5	0.0	0.0	42.4	3.0	0.0	0.0	100
		Numbers	0	0	0	0	128	0	256	1,917	0	0	42.4	3.0	0.0	0.0	4,217
Afognak Early ^b	508	Percent	0.0	0.0	0.4	0.2	59.4	1.6	30.1	7.3	0.0	0.0	1.0	0.0	0.0	0.0	100
		Numbers	0	0	111	55	16,735	443	8,478	2,050	0	0	277	0	0	0	28,150
Late	425	Percent	0.0	0.5	1.4	0.0	58.6	3.5	12.0	22.6	0.0	0.0	1.4	0.0	0.0	0.0	100
		Numbers	0	51	153	0	6,364	383	1,303	2,454	0	0	153	0	0	0	10,862
District Total	966	Percent	0.0	0.0	0.0	0.0	53.7	1.9	23.2	14.9	0.0	0.0	5.1	0.3	0.0	0.0	100.0
		Numbers	0	51	264	55	23,227	826	10,037	6,421	0	0	2,219	128	0	0	43,229
Northwest Kodiak																	
Uganik Lake ^c	418	Percent	0.0	0.7	3.1	0.0	12.9	2.2	47.4	10.3	0.0	0.0	23.4	0.0	0.0	0.0	100
		Numbers	0	172	746	0	3,100	516	11,368	2,468	0	0	5,630	0	0	0	24,000
District Total	418	Percent	0.0	0.7	3.1	0.0	12.9	2.2	47.4	10.3	0.0	0.0	23.4	0.0	0.0	0.0	100
		Numbers	0	172	746	0	3,100	516	11,368	2,468	0	0	5,630	0	0	0	24,000
Southwest Kodiak																	
Little River	456	Percent	0.0	0.0	0.0	0.2	12.1	2.2	6.8	68.2	0.2	0.0	4.2	5.9	0.0	0.2	100
		Numbers															
Karluk Early	1,237	Percent	0.0	0.0	0.0	0.0	1.3	2.8	4.4	45.1	0.5	0.0	27.8	11.1	0.1	6.8	100
		Numbers	0	0	0	0	3,635	8,045	12,637	129,610	1,579	0	79,892	31,980	247	19,543	287,170
Late	1,209	Percent	0.0	0.0	0.0	0.0	0.1	1.9	0.2	58.6	0.4	0.0	26.9	7.4	0.0	4.4	100
		Numbers	0	0	0	0	373	5,654	497	171,016	1,198	0	78,499	21,680	0	12,727	291,646
Ayakulik	1,936	Percent	0.0	0.0	9.2	0.4	22.5	13.0	11.3	29.2	0.0	0.2	12.6	0.9	0.1	0.6	100
		Numbers	0	0	26,957	1,291	65,701	38,019	32,846	85,148	132	461	36,744	2,495	148	1,835	291,774
District Total	4,838	Percent	0.0	0.0	3.1	0.1	8.0	5.9	5.3	44.3	0.3	0.1	22.4	6.5	0.0	3.9	100.0
		Numbers	0	0	26,957	1,291	69,709	51,718	45,980	385,774	2,909	461	195,135	56,155	395	34,105	870,590
Allak Bay																	
Silver Salmon	365	Percent	1.1	24.7	0.5	52.9	9.0	0.5	7.9	0.8	0.0	0.0	2.5	0.0	0.0	0.0	100
		Numbers	66	1,482	30	3,174	540	30	474	48	0	0	156	0	0	0	6,000

- Continued -

Table 7. (Page 2 of 2).

District Stream	Sample Size		Ages														Total
			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	
Allak Bay																	
Akalura																	
Early	346	Percent	0.0	0.0	0.9	0.0	2.6	0.9	88.7	2.0	0.0	0.3	4.6	0.0	0.0	0.0	100
		Numbers	0	0	37	0	110	37	3,743	85	0	12	195	0	0	0	4,219
Late	380	Percent	0.0	0.0	0.0	0.0	3.9	0.5	10.3	81.8	0.0	0.0	3.4	0.0	0.0	0.0	100
		Numbers	0	0	0	0	1,358	181	3,530	28,153	0	0	1,177	0	0	0	34,399
Upper Station																	
Early	1,567	Percent	0.0	1.7	0.0	3.3	1.8	0.1	8.5	70.4	0.0	0.3	13.8	0.1	0.0	0.0	100
		Numbers	0	989	7	1,855	1,009	36	4,804	39,958	0	165	7,841	59	0	0	56,724
Late	1,683	Percent	0.1	56.1	0.2	8.9	18.7	0.5	5.3	9.3	0.0	0.0	0.5	0.2	0.1	0.0	100
		Numbers	361	140,248	488	22,360	46,716	1,262	13,257	23,127	0	0	1,288	509	219	0	249,836
Frazer	1,098	Percent	0.0	0.0	0.0	0.0	1.3	8.4	2.7	82.1	0.5	0.2	2.5	2.2	0.0	0.2	100
		Numbers	0	0	123	0	3,187	20,766	6,540	202,514	1,164	375	6,081	5,495	0	462	246,704
District Total		Percent	0.1	23.9	0.1	4.6	3.7	3.7	5.4	49.2	0.2	0.1	2.8	1.0	0.0	0.1	100.0
		Numbers	427	142,719	685	27,389	52,920	22,312	32,348	293,885	1,164	552	16,738	6,063	219	462	597,882
Eastside Kodiak																	
Saltery	477	Percent	0.0	0.0	0.0	0.0	2.1	0.0	80.9	7.8	0.0	0.0	9.2	0.0	0.0	0.0	100
		Numbers	0	0	0	0	282	0	10,882	1,043	0	0	1,240	0	0	0	13,447
District Total	477	Percent	0.0	0.0	0.0	0.0	2.1	0.0	80.9	7.8	0.0	0.0	9.2	0.0	0.0	0.0	100
		Numbers	0	0	0	0	282	0	10,882	1,043	0	0	1,240	0	0	0	13,447
Northeast Kodiak																	
Buskin	415	Percent	0.0	0.0	0.0	0.2	6.7	1.4	14.9	17.8	0.0	0.0	58.8	0.0	0.0	0.0	100
		Numbers	0	0	0	29	819	176	1,814	2,165	0	0	7,140	0	0	0	12,144
District Total	415	Percent	0.0	0.0	0.0	0.2	6.7	1.4	14.9	17.8	0.0	0.0	58.8	0.0	0.0	0.0	100
		Numbers	0	0	0	29	819	176	1,814	2,165	0	0	7,140	0	0	0	12,144
GRAND TOTAL	19,252	Percent	0.0	9.2	1.8	1.8	9.6	4.8	7.2	44.3	0.3	0.1	14.6	4.0	0.0	2.2	100
		Numbers	427	142,942	28,652	28,764	150,057	75,548	112,429	691,756	4,073	1,013	228,102	62,346	614	34,567	1,561,292

* Age composition was derived from a terminal area commercial catch sample and assumed to represent the escapement.

^b Early and late runs were stratified as through and post 15 July.

^c Uganik Lake escapement numbers were estimated using aerial survey counts.

Table 8. Length composition of selected sockeye escapement samples by district, system, and age, Kodiak Management Area, 1988.

District Section	Ages											Total*	
	0.2	1.1	0.3	1.2	2.1	1.3	2.2	3.1	2.3	3.2	3.3		2.4
Afognak													
<i>Thorsheim</i>													
Mean				489		545	472		530	491			
SE				0		9	5		9	0			
Range				489		536-554	434-499		491	491			
N				1		2	15		14	1			
													434-579
													33
<i>Afognak (Early Run)</i>													
Mean		330	520	473	340	521	474		535				
SE		0	0	2	7	3	5		6				
Range		330	520	410-610	309-370	435-608	400-535		518-550				
N		1	1	297	8	149	37		5				
													309-610
													498
<i>Afognak (Late Run)</i>													
Mean	508	311		479	339	525	480		517				
SE	28	9		2	11	5	3		13				
Range	480-535	280-340		418-570	300-485	436-615	432-593		460-543				
N	2	6		249	15	50	95		6				
													280-615
													423
Northwest Kodiak													
<i>Uganik</i>													
Mean	450	307		451	321	563	445		564				
SE	15	5		4	5	2	4		3				
Range	433-481	270-328		404-508	292-351	473-637	395-510		496-643				
N	3	13		54	9	196	43		98				
													270-643
													416
<i>Little R</i>													
Mean			510	468	313	526	456	322	523	452	524		
SE			0	3	3	3	1	0	4	6	0		
Range			510	400-510	294-331	504-568	388-518	322	505-572	390-516	524		
N			1	55	10	31	311	1	19	27	1		
													294-572
													456
Southwest Kodiak													
<i>Karluk (Early Run)</i>													
Mean			452	356	558	504	363	569	500	573	588		519
SE			8	2	4	1	13	2	3	3	0		
Range			421-502	318-405	492-618	404-584	314-417	482-635	388-585	486-640	588		
N			12	67	51	553	9	354	111	77	1		
													314-640
													1,235

- Continued -

Table 8. (Page 2 of 3).

District Section	Ages												Total ^a
	0.2	1.1	0.3	1.2	2.1	1.3	2.2	3.1	2.3	3.2	3.3	2.4	
<i>Southwest Kodiak</i>													
<i>Karluk (Late Run)</i>													
Mean				533	355	585	533	370	583	527	582		540
SE				6	4	7	1	11	1	4	3		1
Range				512-546	307-406	559-612	432-590	298-412	522-644	444-599	537-652		298-652
N				6	44	8	700	10	309	78	53		1,208
<i>Ayakulik (Red River)</i>													
Mean		336	541	509	390	549	528	397	561	533	564	598	498
SE		2	11	1	2	2	1	0	2	7	8	0	2
Range		294-435	483-582	377-594	308-495	482-654	408-623	397	442-648	488-591	528-654	598	294-654
N		169	9	438	230	242	546	1	265	17	13	1	1,934
<i>Alitak Bay</i>													
<i>Silver Salmon</i>													
Mean	450	325	557	472	334	553	495		544				517
SE	4	0	2	9	6	6	10		7				3
Range	370-540	325	420-630	357-545	328-340	490-633	475-510		500-570				315-633
N	90	2	193	33	2	29	3		9				365
<i>Akalura (Early Run)</i>													
Mean		343		436	363	560	514		563				553
SE		23		11	52	2	9		8				2
Range		320-390		390-505	295-465	430-659	477-550		512-645				295-659
N		3		9	3	305	7		16				344
<i>Akalura (Late Run)</i>													
Mean				494	450	588	548		597				552
SE				8	0	4	1		7				2
Range				440-560	450	520-640	460-615		530-635				440-640
N				15	1	39	311		13				379
<i>Upper Station (Early Run)</i>													
Mean	492	326	576	516	375	564	521		567	555			532
SE	4	0	3	7	10	2	1		2	31			1
Range	402-560	326	495-685	402-603	355-385	461-622	419-616		498-656	524-586			326-685
N	76	1	93	43	3	123	995		224	2			1,564

- Continued -

Table 8. (Page 3 of 3).

District Section	Ages											Total*	
	0.2	1.1	0.3	1.2	2.1	1.3	2.2	3.1	2.3	3.2	3.3		2.4
Alliak Bay													
<i>Upper Station (Late Run)</i>													
Mean	489	342	573	488	393	584	563		610	586		621	507
SE	1	9	3	2	8	3	2		14	14		0	1
Range	372-682	325-355	475-636	417-597	362-434	509-651	420-620		539-655	570-614		621	286-682
N	955	3	140	331	9	84	143		10	3		1	1,682
<i>Frazer L.</i>													
Mean		329		502	364	563	509	372	553	510	530		493
SE		0		4	2	4	1	10	8	4	30		2
Range		329		478-539	314-443	515-603	430-575	340-424	476-621	470-550	500-560		314-621
N		1		16	129	30	858	9	21	28	2		1,095
Eastside Kodiak													
<i>Saltery</i>													
Mean				495		572	479		556				561
SE				10		1	5		5				2
Range				456-529		480-647	409-525		476-630				409-647
N				10		386	37		44				477
Northeast Kodiak													
<i>Buskin</i>													
Mean			542	469	342	534	468		532				514
SE			0	6	12	4	3		2				2
Range			542	391-515	300-380	482-611	420-515		480-600				300-611
N			1	28	6	62	74		244				415

* Age-1.4 sockeye lengths were excluded owing to low frequency of occurrence.

Table 9. Estimated sex composition of selected sockeye escapements by district and system, Kodiak Management Area, 1988.

District System	N	Percent		Escapement		
		Females	Males	Females	Males	Total
<i>Afognak</i>						
Thorsheim	40	65.0	35.0	2,741	1,476	4,217
Afognak (Early Run)	589	55.9	44.1	15,724	12,426	28,150
Afognak (Late Run)	481	51.6	48.4	5,600	5,262	10,862
<i>Northwest Kodiak</i>						
Uganik	489	50.5	49.5	6,065	5,935	12,000
Little R.	598	59.2	40.8			
<i>Southwest Kodiak</i>						
Karluk (Early Run)	1,438	46.4	53.6	133,341	153,829	287,170
Karluk (Late Run)	1,395	32.8	67.2	95,579	196,067	291,646
Ayakulik (Red River)	2,329	31.7	68.3	92,587	199,187	291,774
<i>Alitak Bay</i>						
Silver Salmon	439	41.7	58.3	1,459	2,041	3,500
Akalura (Early Run)	383	66.6	33.4	2,809	1,410	4,219
Akalura (Late Run)	447	50.1	49.9	17,161	17,161	34,399
Upper Station (Early Run)	1,731	40.1	59.9	22,719	34,005	56,724
Upper Station (Late Run)	1,918	54.4	45.6	135,909	113,927	249,836
Frazer	1,200	44.7	55.3	110,223	136,481	246,704
<i>Eastside Kodiak</i>						
Saltery	599	50.4	49.6	6,780	6,667	13,447
<i>Northeast Kodiak</i>						
Buskin	635	56.1	43.9	6,808	5,336	12,144
Total	14,681	42.4	57.6	655,582	891,210	1,546,792

Table 10. Age composition, in percent, of chum salmon samples collected by district and area, Kodiak Management Area, 1988.

District Area	N*	Ages				Total
		0.2	0.3	0.4	0.5	
<i>Northwest Kodiak</i>						
Terror Bay	188	0.0	28.2	69.7	2.1	100.0
Uganik Bay	111	0.0	30.6	65.8	3.6	100.0
Zachar Bay	627	0.0	30.3	67.5	2.2	100.0
<i>Alitak Bay</i>						
Sukhoi Lgn.	359	0.0	56.3	39.3	4.5	100.0
<i>Eastside Kodiak</i>						
Kiliuda Bay	1,378	0.9	30.6	67.6	0.8	100.0
<i>Mainland</i>						
Kukak Bay	133	4.5	51.9	39.8	3.8	100.0

* Numbers of scale samples collected did not allow the commercial catch to be apportioned by age class.

Table 11. Age composition (percent) of Kitoi Bay chum salmon brood stock samples, statistical weeks 27 through 29, 1988.

Statistical Week	Sample Size	Ages			Total
		0.3	0.4	0.5	
27	39	25.6	71.8	2.6	100.0
28	109	23.9	75.2	0.9	100.0
29	109	20.2	78.9	0.9	100.0
Total	257	23.2	75.3	1.5	100.0

Table 12. Length composition (percent) of Kitoi Bay chum salmon brood stock samples, by age and sex, 1988.

	Ages			Total
	0.3	0.4	0.5	
Females				
Mean Length	588	601	566	598
SE	6	3		3
Range	552-662	502-653	566-566	502-662
Sample Size	21	67	1	89
Males				
Mean Length	596	623	683	617
SE	5	3	17	2
Range	540-672	566-682	666-700	540-700
Sample Size	37	129	2	168
All Fish				
Mean Length	593	615	644	611
SE	4	2	40	2
Range	540-672	502-682	566-700	502-700
Sample Size	58	196	3	257

Table 13. Sex composition (percent) of Kitoi Bay chum salmon brood stock samples by statistical week, 1988.

Statistical Week	Numbers			Percent		
	Females	Males	Total	Females	Males	Total
27	15	25	40	37.5	62.5	100.0
28	30	90	120	25.0	75.0	100.0
29	53	67	120	44.2	55.8	100.0
Total	98	182	280	35.6	64.4	100.0

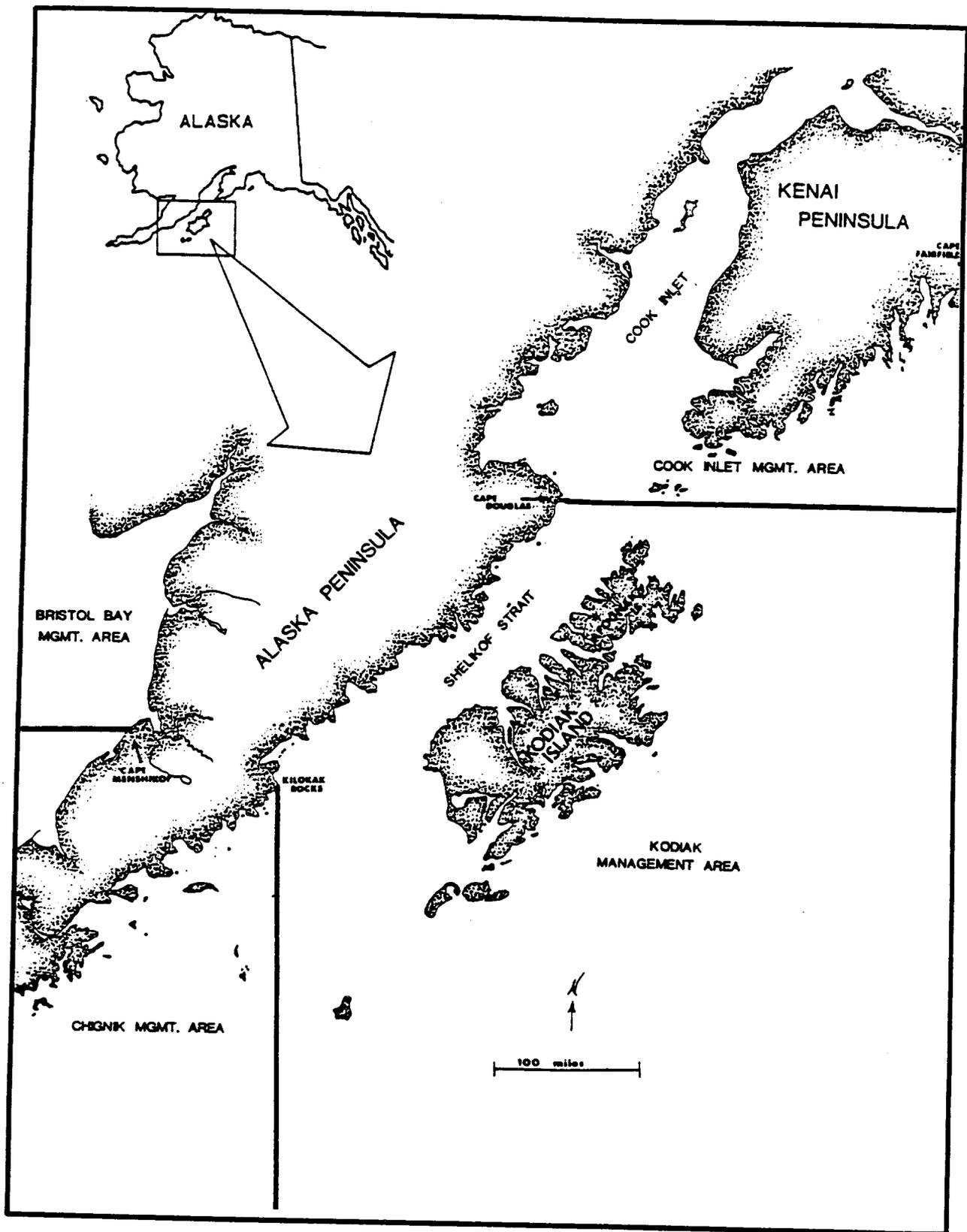
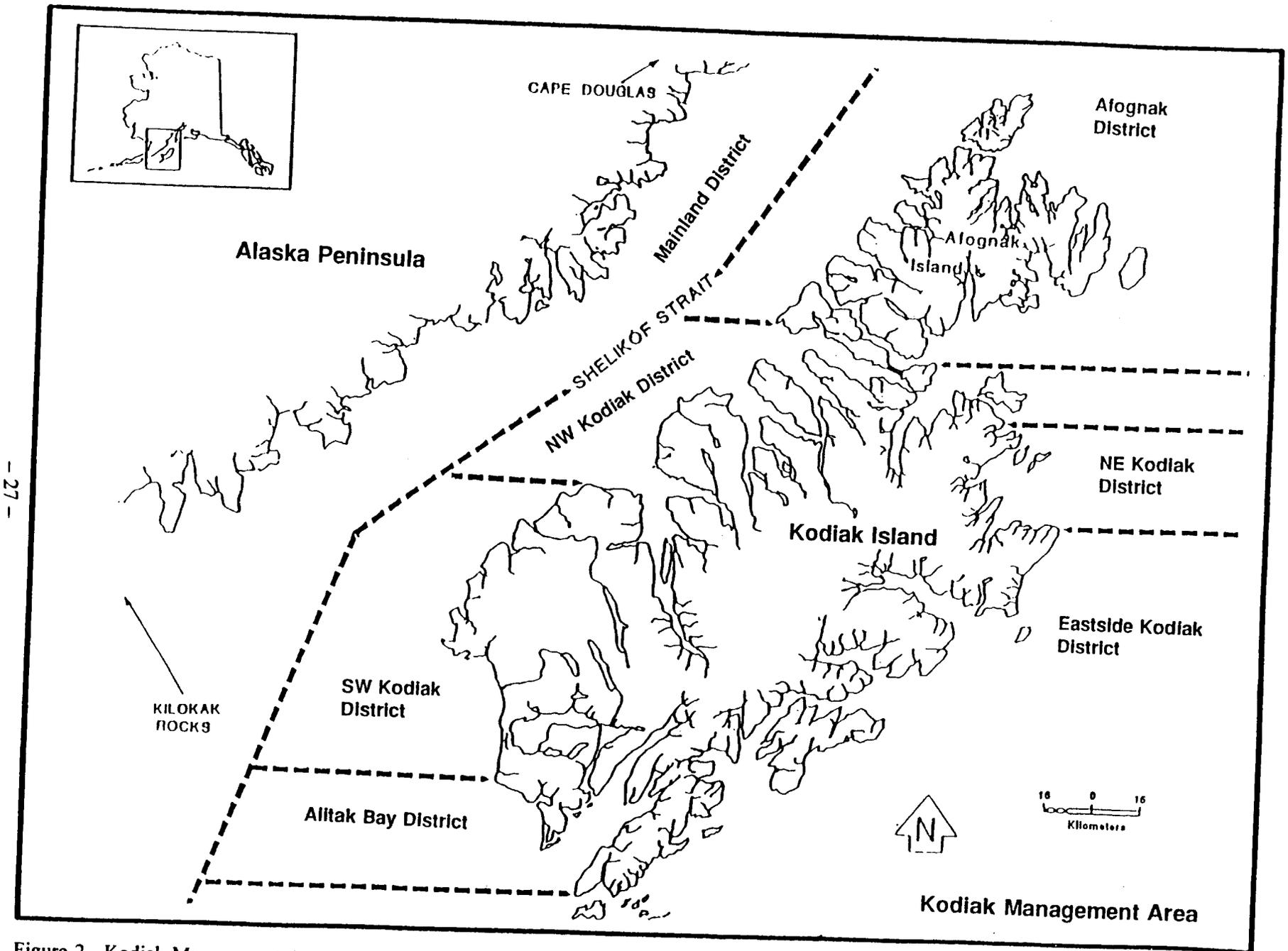


Figure 1. Kodiak and adjacent salmon management areas, 1988.



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Figure 2. Kodiak Management Area salmon fishing districts, 1988.

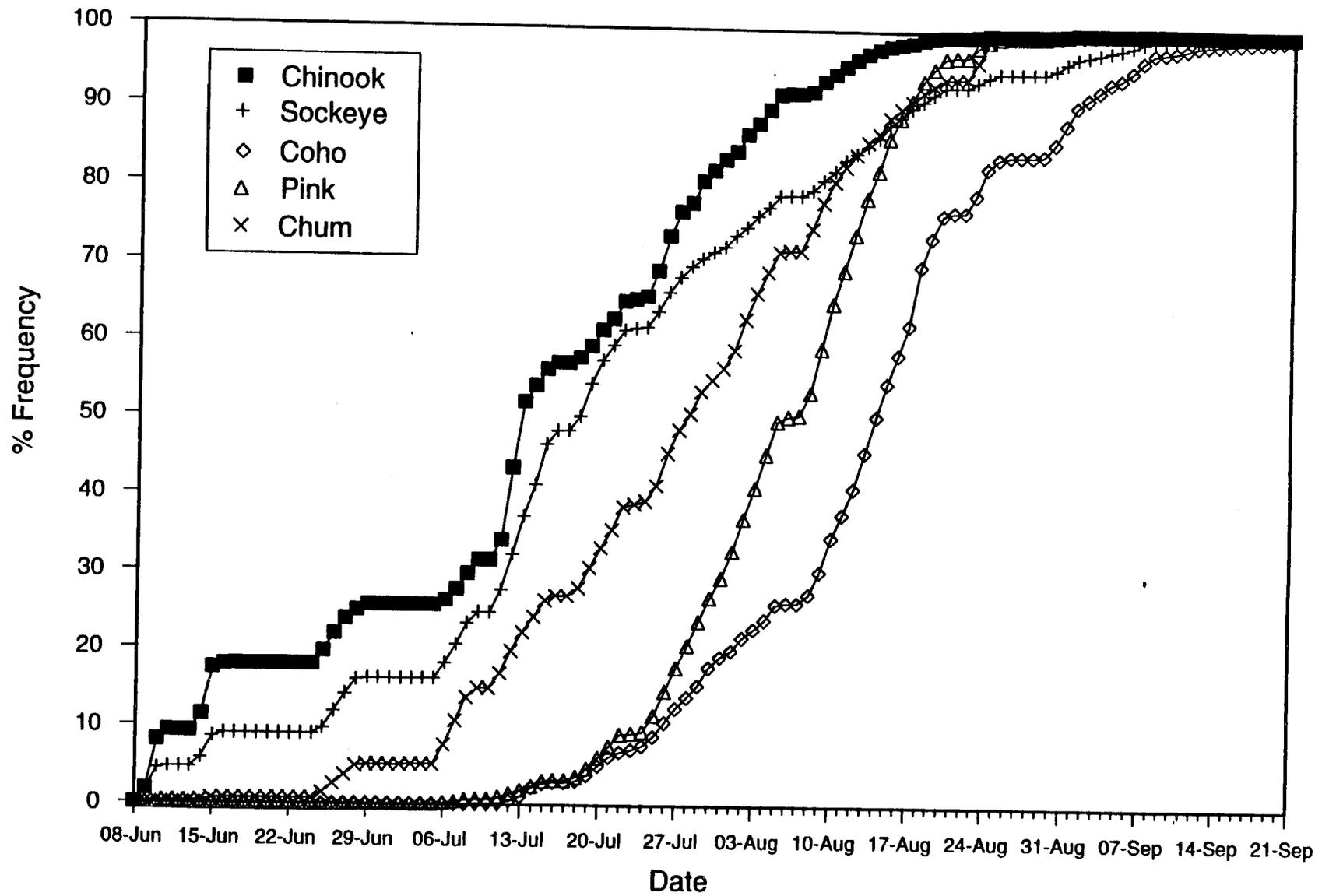


Figure 3. Salmon catch by species presented as cumulative percent by day, Kodiak Management Area, 1988.

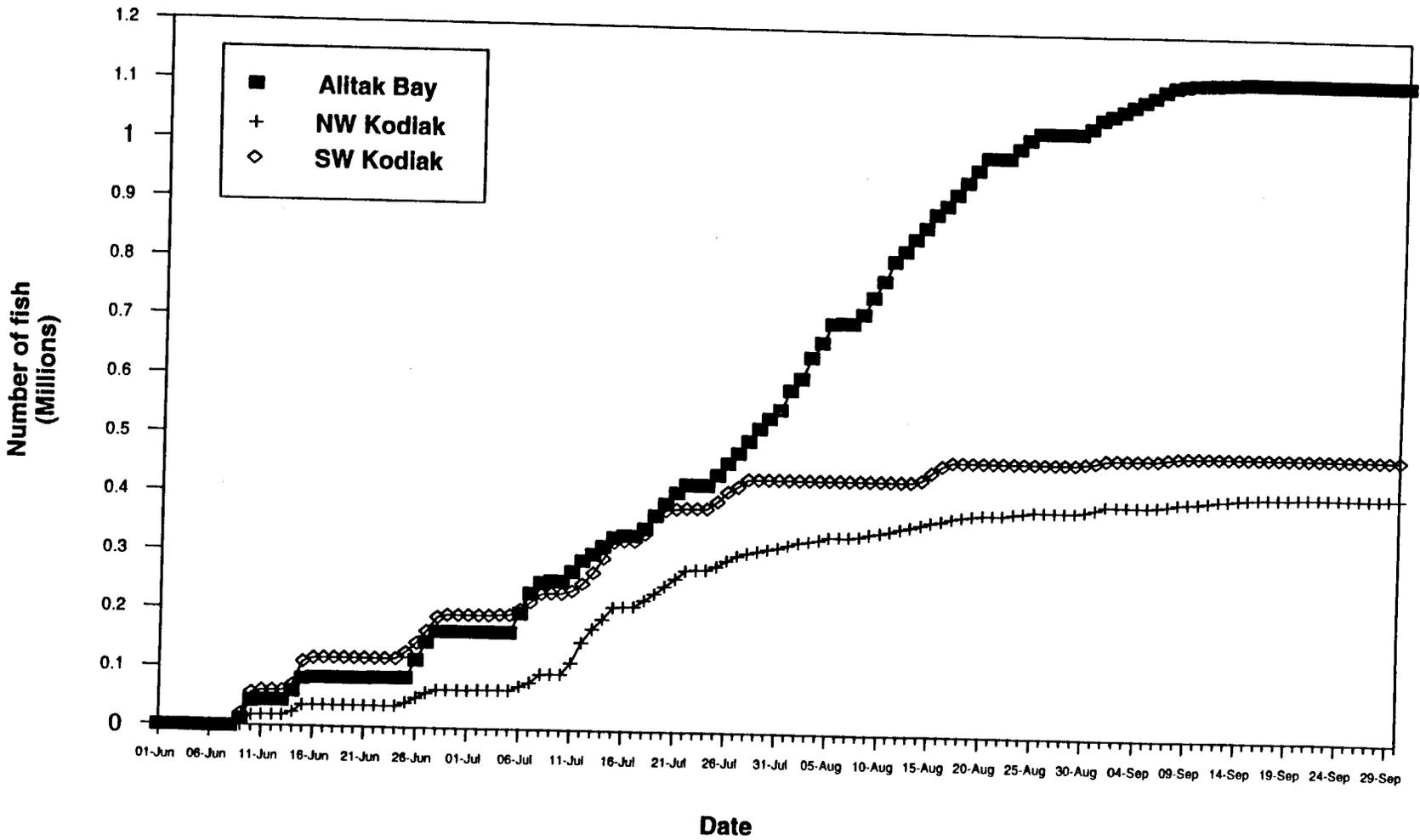


Figure 4. Cumulative sockeye catch numbers by day, Alitak Bay, NW Kodiak, and SW Kodiak Districts, 1988.

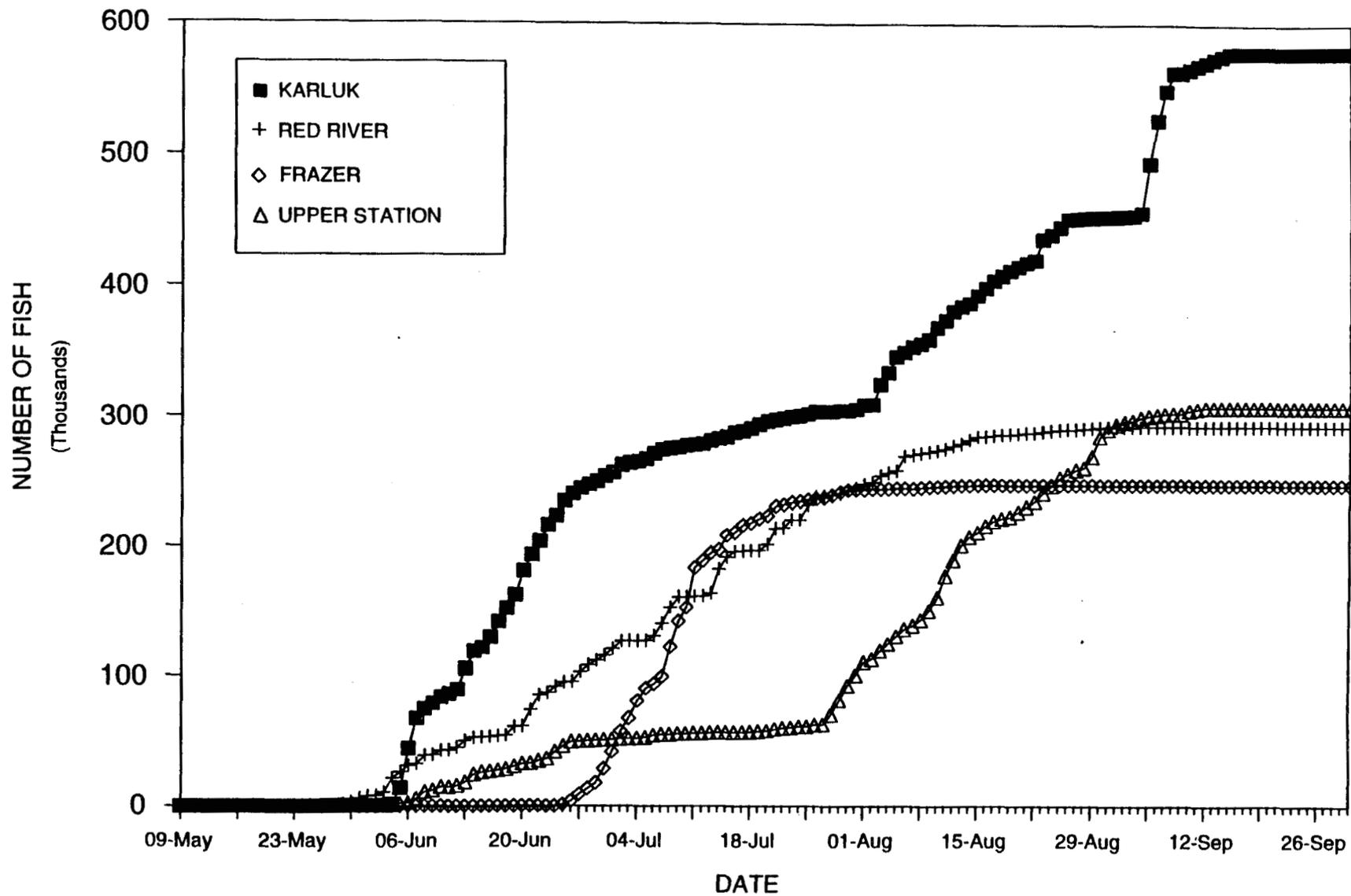


Figure 5. Cumulative sockeye salmon escapements counted by day through the Karluk, Ayakulik, Frazer, and Upper Station weirs, 1988.

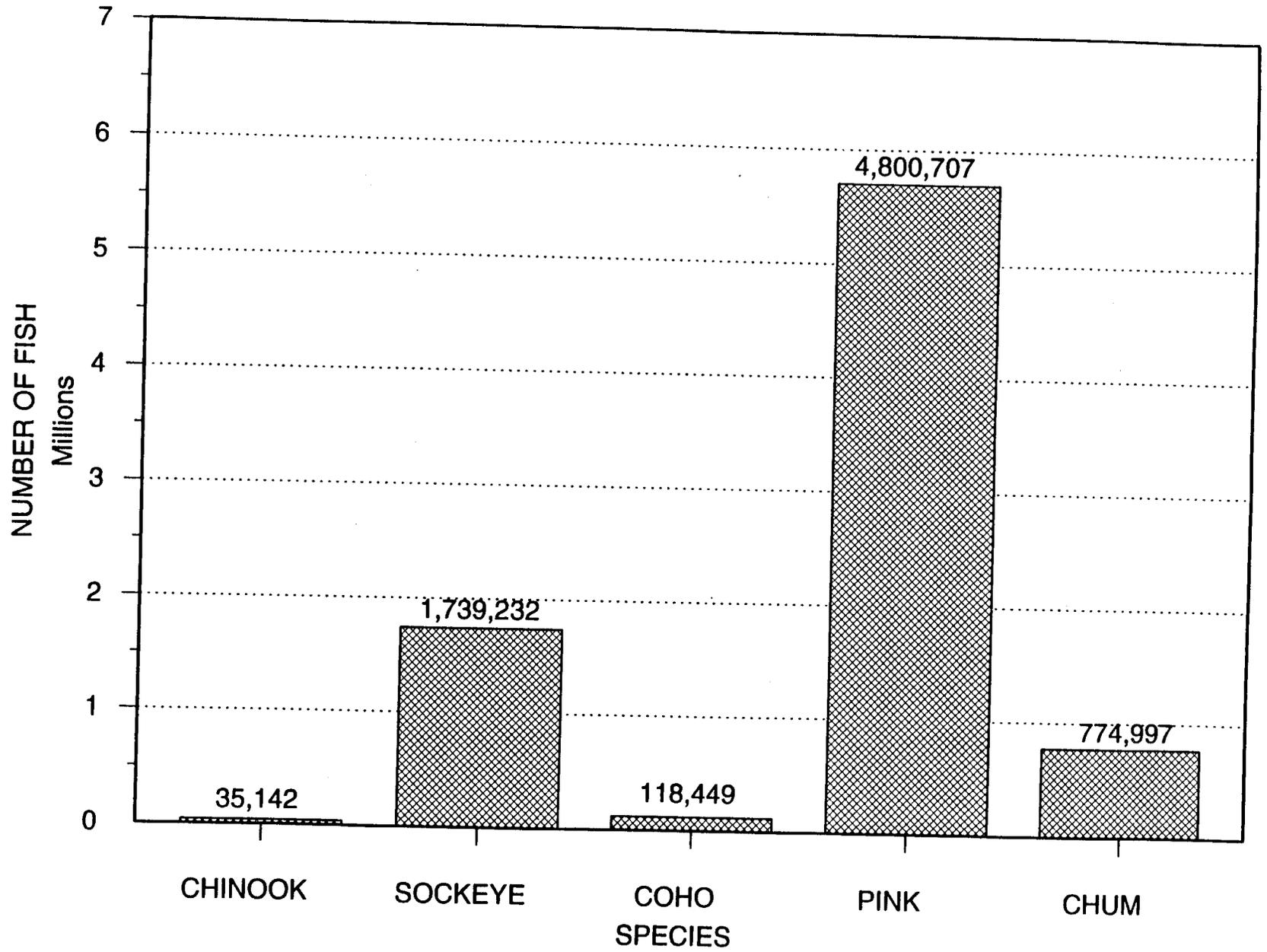


Figure 6. Estimated total salmon escapement numbers by species, Kodiak Management Area, 1988.

APPENDIX

Appendix A. Peak aerial survey, weir, and estimated total escapements by species and district, Kodiak Management Area, 1988.

Stream Number	Sockeye			Coho			Pink			Chum		
	Peak Count	Weir Count	Estimated Total Escapement	Peak Count	Weir Count	Estimated Total Escapement	Peak Count	Weir Count	Estimated Total Escapement	Peak Count	Weir Count	Estimated Total Escapement
<i>Afognak District</i>												
251-101				2,000		4,800	4,000		7,600			
251-105				2,000		4,800	74,500		141,550			
251-201							200		380			
251-202							4,000		7,600			
251-202A							400		760			
251-302		4,217	4,217		0	0		0	0	0	0	0
251-402							75,000		142,500			
251-404							25,000		47,500			
251-504							500		950			
251-601		0	0		2,772	2,772		669	669	0	0	0
251-705		0	0		967	967		1,241	1,241	0	0	0
251-822							11,500		21,850			
251-825							10,000		19,000			
251-830		26	26		2,354	2,354		56,475	56,475	0	0	0
251-831		22,794	22,794		5,563	5,563		434	434	3	3	3
251-901							11,000		20,900			
252-101				500		1,200	2,000		3,800			
252-102				100		240	7,000		13,300			
252-302							3,200		6,080			
252-306							9,800		18,620			
252-307							250		475			
252-309							800		1,520			
252-331				150		360	200		380			
252-332							28,000		53,200	500		645
252-333							2,200		4,180			
252-335							250		475			
252-342		39,012	39,012		9,772	9,772		148,206	148,206	11	11	11
252-343				1,000		2,400	90,000		171,000			
Subtotal		66,049	66,049	5,750	21,428	35,228	359,800	207,025	890,645	500	14	659
<i>Northwest Kodiak District</i>												
253-115							137,500		261,250			
253-121							1,500		2,850			
253-122'	12,000		24,000				84,000		237,000	20,000		44,333
253-331							71,500		197,667	15,000		43,433
253-332							6,000		11,400			

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Appendix A. (Page 2 of 4).

Stream Number	Sockeye			Coho			Pink			Chum		
	Peak Count	Weir Count	Estimated Total Escapement	Peak Count	Weir Count	Estimated Total Escapement	Peak Count	Weir Count	Estimated Total Escapement	Peak Count	Weir Count	Estimated Total Escapement
<i>Northwest Kodiak District (Cont)</i>												
254-103							5,000		9,500			
254-202							85,000		163,833	25,000		44,340
254-203							50		95	50		65
254-204							44,000		44,000			
254-301							30,000		57,000	75,000		96,750
254-401										15,000		19,350
Subtotal	12,000		24,000				464,550		984,595	150,050		248,271
<i>Southwest Kodiak District</i>												
255-101		578,816	578,816		12,083	12,083		711,676	711,676		108	108
256-101							150		285			
256-201		291,774	291,774		19,476	19,476		397,409	397,409		184	184
256-401				5,500		13,200	5,000		9,500			
256-401*										53,200		68,628
256-402							200		380	5,700		13,440
Subtotal		870,590	870,590	5,500	31,559	44,759	5,350	1,109,085	1,119,250	58,900	292	82,360
<i>Alitak Bay District</i>												
257-102										200		258
257-302		38,618	38,618		6,115	6,115		28,010	28,010		0	0
257-303	3,000		6,000		2,263	2,263		75	75		0	0
257-304		306,560	306,560		3,813	3,813		894	894		3	3
257-402 ^b	18,000		18,000				2,200		4,180			
257-403		246,217	246,217		3,543	3,543		59,489	59,489		30,680	30,680
257-404										500		645
257-502							36,000		52,140	10,000		25,840
257-503										500		645
257-601										300		387
257-602										50		65
257-603							200		200	50		65
257-701							85,000		85,000			
Subtotal	21,000	591,395	615,395		15,734	15,734	123,400	88,468	229,988	11,600	30,683	58,588

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- Continued -

Appendix A. (Page 3 of 4).

Stream Number	Sockeye			Coho			Pink			Chum		
	Peak Count	Weir Count	Estimated Total Escapement	Peak Count	Weir Count	Estimated Total Escapement	Peak Count	Weir Count	Estimated Total Escapement	Peak Count	Weir Count	Estimated Total Escapement
<i>Eastside Kodiak District</i>												
258-202							50		95	10		13
258-206										5,000		6,450
258-207							19,000		19,000	20,000		20,000
258-522							20,000		40,223	500		571
258-541							20,000		38,000			
258-542										5,000		6,450
258-602							700		1,330	8,020		10,346
258-701							106,000		106,000			
259-401				400		960	4,800		9,120			
259-404							500		950			
259-410							800		1,520	50		65
259-411	20,000		40,000	2,000		4,800	2,000		3,800			
259-412	1,200		2,400				8,000		10,667	1,500		1,935
259-414							5,600		10,640	300		387
259-415		25,654	25,654	1,000	4,702	5,702	12,500	7,645	20,145		28	28
259-417										1,700		2,193
259-418*										1,800		2,322
259-423										2,000		2,580
259-424										500		645
Subtotal	21,200	25,654	68,054	3,400	4,702	11,462	199,950	7,645	261,490	46,380	28	53,985
<i>Northeast Kodiak District</i>												
259-101							2,000		2,107			
259-102							1,000		1,773			
259-211		12,144	12,144		6,782	6,782		203,648	203,648		84	84
259-221							19,000		36,100			
259-222							12,000		22,800	8,000		10,320
259-223							15,000		28,500	500		645
259-231							500		950	200		258
259-233							80,500		152,950	8,000		10,320
259-235							500		950			
259-242				900		2,160	90,000		189,818	15,000		19,350
259-245							5,600		10,640			
259-251				250		600	42,000		79,800			
259-252							9,000		17,100			
259-253							20,000		38,000			

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Appendix A. (Page 4 of 4).

Stream Number	Sockeye			Coho			Pink			Chum		
	Peak Count	Weir Count	Estimated Total Escapement	Peak Count	Weir Count	Estimated Total Escapement	Peak Count	Weir Count	Estimated Total Escapement	Peak Count	Weir Count	Estimated Total Escapement
Northeast Kodlak District (Cont)												
259-255				20		48						
259-363	3,500		7,000									
259-365				115		276	38,910		98,530	27,500		35,475
259-371							10,000		19,000	15,000		20,100
Subtotal	3,500	12,144	19,144	1,285	6,782	9,866	346,010	203,648	902,666	74,200	84	96,552
Mainland District												
262-151	5,500		11,000									
262-271							8,000		15,200	70,000		90,300
262-272										5,000		6,450
262-301	32,500		65,000									
262-401							4,500		8,550			
262-402							2,500		4,750			
262-451							40,000		76,000	8,000		10,320
262-501							6,500		12,350			
262-551							60,000		114,000	5,000		6,450
262-602										96,000		123,840
262-604							500		950	1,800		2,322
Subtotal	38,000		76,000				122,000		231,800	185,800		239,682
Totals	95,700	1,565,832	1,739,232	15,935	80,205	117,049	1,621,060	1,615,871	4,620,434	527,43	31,101	780,097

^a Uganik sockeye estimated total escapement likely an underestimate owing to lake turbidity.

^b Horse Marine Lake sockeye salmon aerial survey peak count considered to be estimate of total escapement owing to run timing and observations of escapement age, length, and sex sampling crew.

^c Saltery Lake weir and survey counts were added together for pink and coho salmon estimated total escapement.

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