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Chignik Management Area Salmon Catch, Escapement, and Run Statistics, 1988

by

Bruce M. Barrett

and

Frederick M. Thompson

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ABSTRACT

The 1988 Chignik Management Area salmon catch totaled an estimated 4,437,832 fish consisting of 795,841 sockeye *Oncorhynchus nerka*, 2,997,159 pink *O. gorbuscha*, 370,410 coho *O. kisutch*, 267,126 chum *O. keta*, and 7,296 chinook *O. tshawytscha* salmon. The catch was twice the 1978-87 average and 82% above the 1987 level. The highest catches occurred in the Western District, with exception of the sockeye and chinook catches which were the highest in the Chignik Bay District. In the interception fisheries, a combined catch of about 902,624 Chignik origin sockeye salmon occurred in the Cape Igvak Section of the Kodiak Management Area and the Stepovak, Balboa Bay, Beaver Bay Sections of the Alaska Peninsula Management Area. The total Chignik area escapement was estimated to be 679,577 sockeye salmon, 1,657,887 pink salmon, 361,738 chum salmon, and 5,426 chinook salmon. Total coho escapement was not estimated. The Chignik River system sockeye escapement was estimated to be 675,757 fish comprised of 62% Black Lake and 38% Chignik Lake fish. The majority of the pink and chum escapements occurred in the Eastern District and peak spawning occurred in late August. The Chignik area sockeye run was estimated to be 1,578,381 fish comprised of 56% Chignik Lake stock and 44% Black Lake stock. About 57% of the run was harvested by commercial fisheries. The pink run totaled an estimated 4,655,046 fish and the chum run was 628,894 fish. The harvest on these runs was 65% and 42%, respectively. The Chignik River chinook run was about 12,825 fish of which 57% was harvested. The Chingik area sockeye run was predominately age-2.3 fish. Coho salmon in the Chignik Bay District were predominately age 2.1.

KEY WORDS: Pacific salmon, Chignik River, Black Lake, age, escapement, catch, run.

INTRODUCTION

The Chignik Management Area (CMA) encompasses the waters of the North Pacific Ocean between Kilokak Rocks and Kupreanof Point on the Alaska Peninsula (Figure 1). The area includes approximately 300 km of contiguous coastline and 90 designated anadromous fish streams. All five Pacific salmon species spawn and contribute to the commercial purse seine fisheries there. Listed in order of average abundance they are the sockeye salmon *Oncorhynchus nerka*, pink salmon *O. gorbuscha*, chum salmon *O. keta*, coho salmon *O. kisutch*, and chinook salmon *O. tshawytscha*.

The CMA is divided into five fishing districts: the Eastern, Central, Chignik Bay, Western, and Perryville Districts (Figure 2). Within the CMA, commercial salmon fishing is limited to purse seining. Most fishing efforts target on the sockeye salmon returning to the Chignik River system, and the principal effort occurs in Chignik Lagoon within the Chignik Bay District. The Chignik Bay and Central Districts are both generally managed concurrently for the two Chignik River system sockeye runs: the Black Lake run and the Chignik Lake run. The Black Lake run is mainly during June and the escapement goal is 400,000 fish. The Chignik Lake run occurs mainly during July and the escapement goal is 250,000 fish. Both runs are intercepted in fisheries outside the CMA in the Kodiak and Alaska Peninsula Management Areas. The Alaska Board of Fisheries approved management plans permit an annual 15.0% catch of the Chignik River sockeye run, less the escapement through 25 July, to be caught in the Cape Igvak Section of the Kodiak Management Area. Another 6.0% of the Chignik River sockeye run, less the escapement through 25 July, may be caught in the East Stepovak and West Stepovak, Balboa Bay, and Beaver Bay Sections of the Alaska Peninsula Management Area (ADF&G 1988).

Targeted pink and chum fisheries occur in the Perryville, Western, and Eastern Districts of the CMA. All 90 designated anadromous fish streams in the management area are spawning areas for one or both of these species. Although chinook salmon are typically caught in every district, most of the catch occurs during the Chignik Bay District sockeye fishery. Coho salmon are caught in every district, generally incidental to other species. From late August through September coho salmon are managed currently with sockeye salmon in the Chignik Bay District. The Chignik River system is the primary production area for coho and chinook salmon.

Salmon escapement monitoring is an integral component of the CMA fisheries management program. Chignik River sockeye and chinook escapements are counted through a weir located 4 km above Chignik Lagoon. Pink and chum escapements are counted by aerial surveys. Coho escapements are not specifically monitored because of their late timing and budget restrictions.

This report summarizes the available commercial catch, escapement, age, sex, and size data for the CMA 1988 season. The report is intended as a data base document, and therefore interpretation and discussion of the data are limited. This information will provide a basis for analysis of the Chignik salmon resources which includes evaluation of escapement goals, forecasting future run sizes, and management techniques.

METHODS

Catch Estimation

Commercial salmon catches in numbers and pounds of fish were compiled by Division of Commercial Fisheries staff of the Alaska Department of Fish and Game (ADF&G). These catch statistics were generated from sale receipts given to fishermen by buyers at the time of delivery. Because of the volume of sale receipt information entered, the data should be considered accurate but not precise.

Escapement Enumeration

Sockeye and chinook escapements into the Chignik River were counted through a weir located on the river 4 km above Chignik Lagoon. The weir was operational from 27 May through 9 August. During the daylight hours set 10-min counts were made each hour through open weir gates. Each count was expanded into an hourly estimate to determine total daily escapement. During non-daylight period the weir was closed with the exception of a gate which was periodically opened to permit boat passage. When the boat gate was open total counts were made, and these counts were included in the total daily escapement estimate. Chinook salmon smaller than about 650 mm (tip-of-snout to fork-of-tail) were counted through the weir as sockeye salmon due to their size similarity. The number of small chinook salmon was estimated by the proportion of small and large fish in the combined length frequency sample from the catch and escapement. The chinook escapement occurring after the weir was removed on 9 August was estimated by the decline in escapement rate during the last 2 weeks the weir was operated. The post-weir sockeye escapement number was taken from a procedure used by Thompson and Fox (1989) involving a time series analysis of catch and escapement data.

Pink and chum escapements into 82 streams were periodically counted by aerial surveys conducted from early July through early September. For each stream a spawner abundance curve was developed using a computer modeling program. Total escapement was then determined from the area under each curve using an assumed 15-d average stream life for both species (Cousens et al. 1982; Johnson and Barrett 1988). However, peak counts were used for the escapement estimate when the peak count exceeded the estimate obtained by the area under the curve method.

Coho escapement counts were made incidental to aerial counting of pink and chum escapements. Because the counts were incomplete, the coho escapement was not estimated.

Catch and Escapement Sampling

Each fish sampled was measured to the nearest millimeter for mid-eye to fork-of-tail length, a scale was taken, and sex was determined. A meter stick or caliper with 1-mm marks was used for taking the length measurements. Sex was determined by morphological characteristics (snout and abdomen). Age was determined from scales collected from the left side of the fish approximately two rows above the

latteral line in an area crossed by a diagonal from the posterior insertion of the dorsal fin to the anterior insertion of the anal fin (INPFC 1963). One scale was taken from each sockeye salmon and two scales from each chinook and coho salmon sampled. The scales were mounted on gum cards and later impressed in cellulose acetate using a heated hydraulic press (Clutter and Whitsel 1956). A standard microfiche viewer was used to read the scales for age.

The European notation (Koo 1962) was used to report fish age. In this notation the first digit preceded by the decimal refers to the number of freshwater annuli, while the second digit following the decimal is the number of marine annuli. Total age is the sum of the two numbers plus one to account for time of egg incubation. Scale reader accuracy was not tested, but it was assumed that an experienced readers would be 90% or more accurate.

Most of the information within this report was stratified temporally by statistical week. A statistical week is a 7-d period starting at 0000 hours Sunday and ending at 2400 hours Saturday. Each statistical week is sequentially numbered beginning with the first Sunday in January. A list of statistical weeks with the corresponding calendar dates is presented in Appendix A.

Age, length, and sex (ALS) data for sockeye salmon were collected weekly from the Chignik Bay District catch. A sample goal of 600 fish was chosen to provide a simultaneous estimate of the major age classes within 5 percentage points 95% of the time (Thompson 1987).

The ALS sockeye catch sampling was conducted onboard tenders taking catch deliveries in the lagoon. Each weekly sample was obtained from the first two to three seine boats which happened to be making a delivery when the sampling crew was in the lagoon. Because the seine deliveries were unsorted fish, tenders were not discriminating between boats operating in different areas of the lagoon, and likewise, the sampling crew was not targeting any particular group, each ALS sample was assumed to be representative of the catch for the sample date.

About 480 coho salmon were sampled for ALS data from Chignik Bay District catch near the peak of the fishery. ALS data were collected from 40 chinook salmon in the Chignik Bay District catch and from 60 chinook salmon caught in the Chignik River by sport fishermen. Because of limited field staff an ALS sample size goal was not set for coho and chinook salmon.

Two beach seines 15.2m and 30.5m in length were used to sample the sockeye escapement at the outlet of Black Lake. The sample goal was 2,000 fish, which is the level considered necessary to provide 200 or more age-2.3 scales for a stock separation model (Thompson and Fox 1989).

The Black Lake and Chignik Lake sockeye run, catch, and escapement numbers cited in this report were taken from Thompson and Fox (1989) and are based on scale pattern analysis (SPA). The standards used in their SPA models were from early run escapement sampled at the outlet of Black Lake and from the Chignik Bay District catch sampled after 25 July which followed the assumption that the post-25 July catch was all late-run fish to Chignik Lake (Conrad 1984). After the scales were digitized a model was developed from the standards. The model was then used to estimate the stock composition of the Chignik Bay District catch samples. Next, the catch and escapement data were adjusted to the migration time

in the Chignik Bay District. The migration times used were: 5 d Cape Igvak and Stepovak, Balboa, and Beaver Bays; 3 d Perryville and Eastern, excluding the Aniakchak Statistical Area; 1 d for the Western District and the Aniakchak Statistical Area; 1 d for the Central District; and -1 d for the Chignik River weir. The final step was assigning the daily run totals based on the stock composition estimates of the catch samples. The daily run totals prior to the first sample were assigned the stock composition estimate of the first catch sample. The daily run totals coinciding to the sample days were assigned the respective values of those samples, and the daily run totals between sampling days were assigned interpolated values from the known samples. The daily run totals after the last catch sample day were given the stock composition estimate of the last catch sample.

Data presented graphically in this report were smoothed by the von Hann linear/filter method (BMDP 1981). By this method each observation was smoothed by the formula: (Po+(2(Ov))+Fo)/4 where: Ov is the observation; Po is the preceding observation; and Fo is the following observation. Mean lengths were computed from an unweighted composite of the samples collected from each area, and sex compositions were computed by week for each sampled area.

RESULTS

A total of 4,437,832 salmon were caught in the CMA in 1988 (Table 1). Pink salmon predominated (68%) the catch, followed by sockeye (18%), coho (8%), chum (6%), and chinook salmon (<1%). Most of the salmon were caught in the Western (35%), Eastern (25%), and Central (17%) Districts. The 1988 salmon harvest was twice the 20-year (1978-1987) average and 82% higher than the 1987 catch. Catches of all species in 1988 were well above the 1987 catch levels, except sockeye salmon which was well below the 1987 catch.

In 1988 all 102 salmon limited entry permits available for the CMA were used. There were 3,895 landings and 54% were in the Chignik Bay District (Table 2). Thirteen salmon buyers purchased raw salmon caught in the CMA (Thompson and Fox 1989).

Chinook Salmon

The 1988 chinook catch was 7,296 fish which is more than twice the 1978-1987 average (Table 1). The catch occurred from 30 June through 24 August with most of the fish being taken in July (Table 2). The Chignik Bay District supported 59% of the area catch. The peak catch there was on 7 July. Age-1.4 fish were dominant (39%) in a catch sample of 33 fish (Table 3). Based on fish ticket receipts the average chinook weight was 17.7 lb (Thompson and Fox 1989).

The chinook escapement through the Chignik River weir was estimated to be 4,958 large fish (>650 mm) and 818 small fish (<650 mm) for a total of 5,776 fish which is about three times the 1963-1987 average (Table 4). The sport fishery removed

approximately 201 of the chinook salmon from the estimated escapement above the weir (P. Murray, ADF&G, Kodiak, personal communication). Approximately 90% of the chinook escapement went through the weir between 27 June and 5 August. The peak daily passage of chinook salmon through the weir occurred on 9 July.

A sport fishery sample of 58 fish was 76% age 1.4, 12% age 1.3, and 9% age 1.2 (Table 5). In this sample the male to female ratio was 1:1.1, and the average fish length was 871mm (Table 6). A composite commercial catch sample from Chignik Lagoon was 39% age 1.4, 21% age 1.3, 24% age 1.2 and 15% age 1.1 (Table 3). The chinook sport fish sample may be biased. Although not tested, sport fishermen probably tend to select the larger and thus older fish.

Based on 82 CMA streams surveyed for salmon escapement from aircraft, all chinook spawning was limited to the Chignik River system in 1988 (Thompson and Fox 1989). This finding was
consistent with historical escapement survey data (Barrett 1989).
An updated brood table for the Chignik River chinook run is provided in Table 7. In the brood table the 1988 run age composition was estimated using the average composition of the commercial catch and inriver sport fish sample.

Sockeye Salmon

In 1988 a total of 795,841 sockeye salmon were caught in the CMA (Table 1). In the interception fishery 27,682 sockeye salmon were caught in the Cape Igvak Section, and 79,101 were caught in the East Stepovak and West Stepovak, Balboa Bay, and Beaver Bay Sections (Table 8). The combined sockeye catch for the CMA and interception fisheries was 902,624 fish. Of these, about 30% were from the Black Lake run and about 70% from the Chignik Lake run (Thompson and Fox 1989).

Within the CMA, the Chignik Bay District accounted for 67% of the sockeye catch, followed by the Central District with 15%, the Western District with 12%, the Eastern District with 3%, and the Perryville District with 3% (Table 2).

The Chignik Bay sockeye catch was mainly age-2.3, age-2.2, and age-1.3 fish (Table 9). Age-1.3 fish were dominate in statistical weeks 24 through 26 (5-25 June), and age-2.3 fish were dominate in statistical weeks 27 through 36 (26 June - 3 September). The Black Lake component of the catch was mostly age 2.3 (73.8%), as was the Chignik Lake component (69.5%; Thompson and Fox 1989). Overall the 1988 catch was dominated by the Chignik Lake stock, ages 2.3, 2.2, and 1.3 (Table 10).

The average sockeye length in the Chignik Bay District catch was 572 mm (Table 11). Male average length was 576 mm, while the female average was 568 mm. Among the age-.2 fish, males averaged larger than the females, but among the age-.3 fish females were larger than the males. The male to female ratio for the season was 1:1.4 (Table 11).

Total escapement into the Chignik River system was 675,757 sockeye salmon (Table 10). The Black Lake and the Chignik Lake escapement goals of 400,000 and 250,000 fish, respectively, were slightly exceeded in 1988 with the Black Lake escapement at 420,577 fish and the Chignik Lake escapement at 255,180 fish.

Based on peak aerial counts the non-Chignik River system sockeye escapement was at least 3,100 fish in Aniakchak River, 700 fish in Port Wrangell Creek, 10 fish in Cape Providence Creek, and 10 fish in unnamed stream 272-802 (Thompson and Fox 1989).

A total of 1,937 legible scales were collected from the escapement at the outlet of Black Lake from 24-29 June (Table 12). The age composition varied between daily samples, indicating heterogeneity in the schooled fish at the lake outlet (chi-square test, 3 df, a=0.05). In a composite of the samples age-1.3 fish were dominant (49%) followed by age-2.3 fish (36%). The average fish length was 574 mm; the male to female ratio was 1:0.7 (Table 13).

The 1988 combined Black Lake and Chignik Lake sockeye run was estimated to be 1,578,381 fish comprised of 44% Black Lake stock and 56% Chignik Lake stock (Table 10). Approximately 39% of the Black Lake run and 71% of the Chignik Lake run was taken in the commercial catch. For both runs combined the catch rate was 57%.

Pink Salmon

The 1988 CMA pink catch was 2,997,159 fish, which is the largest catch of recent record (Table 1). The majority of the catch occurred in the Eastern (34%) and Western (38%) Districts. In both districts the peak period was in statistical week 32 (31 July-6 August).

The estimated total pink escapement for the 82 monitored streams was an 1,657,887 fish, more than twice the management goal of 700,000 (Probasco et al. 1987) (Table 14). Most of the escapement was in the Eastern District (61%). The peak of the escapement was in late August (Thompson and Fox 1989).

The CMA pink run was 4,655,046 fish with 65% as catch and 35% as escapement (Tables 2 and 14). Eastern District pink salmon dominated the run with 43% of the fish.

Chum Salmon

The 1988 CMA chum catch was 267,126 fish which is 36% above the 1960-87 average and about twice the 1987 level (Table 1). The Western and Eastern Districts had the highest catches at 102,081 fish and 77,511 fish, respectively (Table 2).

CMA escapement was an estimated 361,738 fish. The Eastern District accounted for about 61% of the CMA chum escapement (Table 14). Based on aerial survey counts, the CMA escapement peak occurred in late August (Thompson and Fox 1989).

The CMA chum run was 628,864 fish with 42% catch and 58% escapement (Tables 2 and 14). The Eastern District had nearly half (48%) of the run.

Coho Salmon

The CMA coho catch was 370,410 fish which is the highest annual catch of record (1960-88; Table 1). The bulk (56%) of the catch occurred in the Western District (Table 2). Catches peaked there in statistical week 30 (17-23 July) and in statistical week 32 (31 July-6 August). In the Chignik Bay District where about 25% of the CMA total coho catch occurred, the coho catches peaked in statistical week 36 (28 August-03 September).

The Chignik Bay District is a terminal catch area for coho salmon returning to the Chignik River system. If the run timing of the Chignik River coho salmon is similar to the timing of other CMA coho stocks, then the July Western District coho catch is mainly nonlocal fish (Table 2 and Figure 3). In July the Western District is managed for the local pink and chum runs, resulting in the coho catch being incidental to the harvest of these species.

Based on a composite sample of 456 ageable scales, the Chignik Bay District catch was 55% age 2.1 and 44% age 1.1 (Table 15). In the sample male and female coho salmon both averaged 598mm in length, and their ratio was 1:0.6 (Table 16).

Although not specifically monitored, some coho escapement was observed during the late August pink and chum aerial surveys particularly in the Eastern District (Thompson and Fox 1989).

DISCUSSION

The sockeye runs to Black and Chignik Lakes are economically the most important segment of the CMA commercial salmon fisheries. As such they have been the focus of research studies by the University of Washington, U.S. Bureau of Fisheries and the Alaska Department of Fish and Game. Many of these studies have been directed towards assigning catch and escapement to the Black Lake and Chignik Lake stocks. Initially, researchers developed an average time of entry (ATOE) curve to describe the entry pattern and percent composition of each run on a daily basis (Marshall et al. 1980). This method of assessing catch and escapement was replaced by SPA in 1984 by Conrad (1984) who improved on work initiated by Marshall et al. (1980). The SPA method is considered superior to the ATOE curve because it provides year-specific time of entry curves for the major age classes of each stock (Marshall et al. 1980). The SPA estimate of the Black Lake escapement age composition has been noticeably different from the Black Lake escapement samples of age composition for years 1986 to 1988 (Table 17). Conrad (1984) speculates that the sockeye schools at the outlet of Black Lake may be segregated by time of arrival and age composition. This hypothesis is further supported (1) by 1985-88 escapement samples collected at the outlet of Black

Lake in which between-day age composition samples were found to be statistically different (Barrett 1989), and (2) by the obvious absence of the late Black Lake escapement component as effected by the timing of the sampling conducted there. Based on this information, the Black Lake escapement age composition appears to change with respect to time, and a single composite sample collected near the peak of the escapement is not representative of the entire Black Lake escapement.

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Table 1. Chignik Management Area salmon catch by species, 1960-1988[a].

YEAR	CHINOOK	SOCKEYE	COHO	PINK	CHUM	TOTAL
1960	643	715,969	8,933	557,327	486,699	1,769,571
1961	409	322,890	3,088	443,510	178,760	948,657
1962	435	364,753	1,292	1,519,305	364,335	2,250,120
1963	1,744	408,606	9,933	1,662,363	112,697	2,195,343
1964	1,099	560,703	2,735	1,682,365	333,336	2,580,238
1965	1,592	635,078	9,602	1,118,158	120,589	1,885,019
1966	636	224,615	16,050	683,215	238,883	1,163,399
1967	882	472,874	13,150	108,981	75,543	671,430
1968	674	878,449	2,200	1,290,660	223,861	2,395,844
1969	3,448	310,087	18,103	1,779,736	67,721	2,179,095
1970	1,225	1,327,664	15,348	1,287,605	464,674	3,096,516
1971	2,010	1,016,136	14,557	612,290	353,952	1,998,945
1972	464	378,669	19,615	72,240	78,356	549,344
1973	525	870,706	22,322	25,445	8,701	927,699
1974	255	662,905	12,245	70,017	34,454	779,876
1975	549	400,193	53,283	66,165	25,161	545,351
1976	763	1,135,572	35,301	388,917	80,221	1,640,774
1977	711	1,972,219	17,429	604,824	110,452	2,705,635
1978	1,603	1,576,283	20,212	985,114	120,889	2,704,101
1979	1,266	1,063,742	93,146	2,056,999	188,169	3,403,322
1980	2,325	846,356	117,862	1,125,465	312,572	2,404,580
1981	2,694	1,839,469	78,805	1,162,613	580,332	3,663,913
1982	5,236	1,521,857	300,384	873,390	390,096	3,090,963
1983	5,488	1,823,057	61,915	321,160	159,362	2,370,982
1984	4,318	2,662,449	110,128	446,184	63,408	3,286,487
1985	1,919	946,369	206,624	174,966	26,146	1,356,024
1986	3,037	1,645,834	116,633	647,125	176,640	2,589,269
1987	2,651	1,898,838	150,414	246,775	127,261	2,425,939
1988	7,296	795,841	370,410	2,997,159	267,126	4,437,832
Avg (1960-1987)	1,736	1,017,227	54,690	786,176	196,545	2,056,373
Avg (1978-1987)	3,054	1,582,425	125,612	803,979	214,488	2,729,558

[a]Catch does not include Cape Igvak or Balboa-Stepovak catches.

Table 2. Chignik Management Area commercial salmon catch and effort by district and statistical week, 1988.

District	Date Stat. Week	Date Calendar	Permits Fished	Landings	Catch (Number of Fish) Chinook	Sockeye	Pink	Chum	Coho	Total
CHIGNIK BAY										
	24	6/05-6/11	1	2	0	801	0	0	0	801
	25	6/12-6/18	1	1	0	832	0	0	0	832
	26	6/19-6/25	1	2	0	1,375	0	0	0	1,375
	27	6/26-7/02	86	242	1,334	73,346	96	215	1	74,992
	28	7/03-7/09	76	273	2,203	117,148	139	1,451	13	120,954
	29	7/10-7/16	84	260	371	121,031	509	366	150	122,427
	30	7/17-7/23	75	295	292	99,835	2,875	1,200	910	105,112
	31	7/24-7/30	60	89	50	24,035	1,811	338	109	26,343
	32	7/31-8/06	48	117	41	18,176	35,899	1,766	762	56,644
	33	8/07-8/13	47	84	15	8,263	34,469	854	1,051	44,652
	34	8/14-8/20	57	117	13	10,866	32,091	556	3,160	46,686
	35	8/21-8/27	65	188	6	19,614	10,683	212	14,052	44,567
	36	8/28-9/03	65	160	5	13,251	1,175	41	31,090	45,562
	37	9/04-9/10	56	132	1	5,303	46	10	21,381	26,741
	38	9/11-9/17	30	94	0	6,573	1	3	15,039	21,616
	39	9/18-9/24	14	47	0	7,393	0	1	5,812	13,206
	40	9/25-10/1	8	12	0	1,287	0	0	668	1,955
	41	10/2-10/8	2	2	0	411	0	0	94	505
Total			96	2,112	4,331	529,540	119,794	7,013	94,292	754,970
CENTRAL										
	26	6/19-6/25	1	2	0	417	0	0	0	417
	27	6/26-7/02	21	47	46	15,404	443	1,830	3	17,726
	28	7/03-7/09	21	46	86	23,997	1,003	4,604	100	29,790
	29	7/10-7/16	42	91	221	32,437	8,784	8,855	1,572	51,869
	30	7/17-7/23	44	128	504	40,479	36,158	9,809	5,488	92,438
	31	7/24-7/30	27	33	163	5,622	43,553	7,673	1,238	58,249
	32	7/31-8/06	20	29	21	782	128,855	2,546	752	132,956
	33	8/07-8/13	35	54	43	2,034	69,335	2,859	3,812	78,083
	34	8/14-8/20	27	37	4	1,255	21,522	755	2,454	25,990
	35	8/21-8/27	18	31	6	1,436	8,593	372	2,768	13,175
	36	8/28-9/03	9	11	0	240	124	13	3,431	3,808
Total			75	508	1,094	124,103	318,370	39,316	21,618	504,501
EASTERN										
	27	6/26-7/02	3	7	21	3,438	61	251	0	3,771
	28	7/03-7/09	6	18	64	14,503	971	2,891	10	18,439
	29	7/10-7/16	8	16	18	4,690	10,691	6,148	65	21,612
	31	7/24-7/30	4	6	20	239	2,585	2,802	3	5,649
	32	7/31-8/06	26	89	34	1,375	461,904	53,933	211	517,457
	33	8/07-8/13	32	83	15	921	308,866	8,673	1,882	320,357
	34	8/14-8/20	9	22	12	487	90,817	1,498	1,753	94,567
	35	8/21-8/27	24	40	6	46	130,471	1,315	2,179	134,017
	37	9/04-9/10	1	1	0	0	0	0	64	64
Total			54	282	190	25,699	1,006,366	77,511	6,167	1,115,933
WESTERN										
	28	7/03-7/09	25	39	216	28,006	8,078	7,505	394	44,199
	29	7/10-7/16	51	75	447	20,767	3,027	5,828	1,281	31,350
	30	7/17-7/23	47	87	143	29,208	89,771	26,367	48,448	193,937
	31	7/24-7/30	57	89	77	6,121	67,240	11,375	28,222	113,035
	32	7/31-8/06	52	172	216	3,289	426,472	34,451	61,165	525,593
	33	8/07-8/13	55	157	69	2,315	420,939	9,782	37,524	470,629
	34	8/14-8/20	52	111	45	1,232	122,032	6,552	24,034	153,895
	35	8/21-8/27	5	5	0	32	2,297	133	799	3,261
	36	8/28-9/03	10	18	1	1,897	1,520	87	4,025	7,530
	37	9/04-9/10	4	8	2	203	6	1	1,194	1,406
Total			80	760	1,216	93,070	1,141,382	102,081	207,086	1,544,835
PERRYVILLE										
	28	7/03-7/09	3	9	302	6,359	811	1,599	177	9,248
	29	7/10-7/16	27	36	64	7,025	1,328	3,272	521	12,210
	30	7/17-7/23	8	12	39	3,767	12,870	5,362	11,658	33,696
	31	7/24-7/30	16	24	9	2,492	33,773	4,465	10,145	50,884
	32	7/31-8/06	19	76	30	2,255	237,627	19,874	11,763	271,549
	33	8/07-8/13	21	61	17	1,285	107,608	5,745	6,233	120,888
	34	8/14-8/20	10	15	4	246	17,230	888	750	19,118
Total			46	233	465	23,429	411,247	41,205	41,247	517,593
ALL DISTRICTS			102	3,895	7,296	795,841	2,997,159	267,126	370,410	4,437,832

Table 3. Age composition of chinook salmon from the Chignik Bay District catch, 1988.

Date			Ages				
Stat. Week	Sample		1.1	1.2	1.3	1.4	All
27	07/02	N	0	0	1	6	7
		%	0.0	0.0	14.3	85.7	100
28	07/07	N	5	4	4	4	17
		%	29.4	23.5	23.5	23.5	100
29	07/14	N	0	3	1	1	5
		%	0.0	60.0	20.0	20.0	100
30	07/18	N	0	1	1	0	2
		%	0.0	50.0	50.0	0.0	100
32	08/02	N	0	0	0	2	2
		%	0.0	0.0	0.0	100.0	100
Composite		N	5	8	7	13	33
		%	15.2	24.2	21.2	39.4	100

Table 4. Chinook catch, escapement, and run in number of fish and exploitation rates for the Chignik River stock, 1960-1988.

Year	Catch					Escapement[b]				
						Length				
	Commercial	Subsistence	Personal[a]	Sport (Freshwater)	Total	<650 mm (Weir Count)	>650 mm (Weir Count)	Total[c]	Run	Percent Harvest
1960	643	75	100	50	868					
1961	409	75	100	50	634					
1962	435	75	100	50	660					
1963	1,744	75	100	50	1,969	145	564	659	2,628	75%
1964	1,099	75	100	50	1,324	236	914	1,100	2,424	55%
1965	1,592	75	100	50	1,817	243	942	1,135	2,952	62%
1966	636	75	100	50	861	212	822	984	1,845	47%
1967	882	75	100	50	1,107	387	1,500	1,837	2,944	38%
1968	674	75	100	50	899	258	1,000	1,208	2,107	43%
1969	3,448	75	100	50	3,673	155	600	705	4,378	84%
1970	1,225	75	100	50	1,450	645	2,500	3,095	4,545	32%
1971	2,010	75	100	50	2,235	516	2,000	2,466	4,701	48%
1972	464	75	100	100	739	453	1,500	1,853	2,592	29%
1973	525	75	100	50	750	212	822	984	1,734	43%
1974	255	75	100	50	480	173	672	795	1,275	38%
1975	549	75	100	50	774	226	877	1,053	1,827	42%
1976	763	100	100	50	1,013	181	700	831	1,844	55%
1977	711	50	100	50	911	206	798	954	1,865	49%
1978	1,603	50	100	69	1,822	309	1,197	1,437	3,259	56%
1979	1,266	9	100	45	1,420	271	1,050	1,276	2,696	53%
1980	2,325	6	100	55	2,486	506	876	1,327	3,813	65%
1981	2,694	100	100	80	2,974	413	1,603	1,936	4,910	61%
1982	5,236	2	100	120	5,458	622	2,412	2,914	8,372	65%
1983	5,488	0	100	180	5,768	501	1,943	2,264	8,032	72%
1984	4,318	26	100	270	4,714	1497	5,806	7,033	11,747	40%
1985	1,919	1	100	400	2,420	594	3,144	3,338	5,758	42%
1986	3,037	6	100	450	3,593	245	3,651	3,446	7,039	51%
1987	2,651	10	100	300	3,061	285	2,695	2,680	5,741	53%
1988	7,296	3	100	201	7,600	818	4,958	5,575	13,175	58%
Average 1963-1987	1,885	53	100	111	2,149	380	1,624	1,892	4,041	53%

-Continued-

Table 4. (page 2 of 2)

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[a] Subjective estimates by area biologist of the catch.

[b] Weir counts of chinook salmon do not include fish less than approximately 650 mm. Chinook salmon less than approximately 650 mm are counted as sockeye salmon due to the similarity in length. The number of chinook salmon smaller than 650 mm for 1986 through 1988 were estimated from length frequency data. The values for the other years were determined from relationship of marine age and length presented by Barrett (1988) were essentially all chinook salmon smaller than 650 mm in the Chignik River system are marine age .2 or younger.

[c] The sport catch has been deducted from the escapement estimates as the sport fishery occurs above the Chignik River weir.

Table 5. Age composition of chinook salmon from the Chignik River sport fish catch, 1988.

Sex		Ages 1.1	1.2	1.3	1.4	1.5	All
Female	N	0	0	0	30	1	31
	%	0.0	0.0	0.0	96.8	3.2	100.0
Male	N	0	5	7	14	1	27
	%	0.0	18.5	25.9	51.9	3.7	100.0
Combined	N	0	5	7	44	2	58
	%	0.0	8.6	12.1	75.9	3.4	100.0

Table 6. Mean length (mm) of chinook salmon sport caught in the Chignik River, 1988.

	Ages				
Sex	1.2	1.3	1.4	1.5	All
Female					
Mean			905	944	906
SE			7		
N	0	0	30	1	31
Male					
Mean	651	779	912	935	830
SE	11	7	17		
N	5	7	14	1	27

Table 7. Chignik River chinook salmon returns from parent year escapements by age, 1966-1988.

Year	Escap.	Ages								Total Return	Return per Spawner
		1.0	1.1	1.2	1.3	2.2	1.4	2.3	1.5		
1966	984	0	229	694	1,497	0	764	0	20	3,203	3.3
1967	1,837	0	238	717	1,228	0	788	18	14	3,004	1.6
1968	1,208	0	246	409	552	0	580	13	21	1,822	1.5
1969	705	0	191	265	406	0	831	19	21	1,733	2.5
1970	3,095	0	91	195	582	0	838	19	21	1,746	0.6
1971	2,466	0	67	279	587	0	848	20	37	1,837	0.7
1972	1,853	0	96	281	594	0	1,482	34	31	2,517	1.4
1973	984	0	97	285	1,038	0	1,226	28	93	2,766	2.8
1974	795	0	98	497	858	0	1,302	0	56	2,811	3.5
1975	1,053	0	171	411	1,023	0	2,233	52	95	3,984	3.8
1976	831	0	141	1,209	1,564	0	3,807	88	91	6,900	8.3
1977	954	0	186	749	2,666	0	3,652	84	133	7,472	7.8
1978	1,437	0	257	1,278	2,558	0	5,342	123	0	9,558	6.7
1979	1,276	0	438	1,226	3,741	0	3,338	0	148	8,891	7.0
1980	1,327	0	421	1,793	1,502	0	4,245	296	0	8,255	6.2
1981	1,936	0	615	417	1,908	0	2,486	0	227	5,426	2.8
1982	2,914	0	501	443	2,663	118	7,592	0			
1983	2,264	0	0	473	2,192	0					
1984	7,033	0	0	2165						average	3.8
1985	3,338	0	0								
1986	3,446	0									
1987	2,680										
1988	5,575										

Table 8. Escapement, catch by district and interception fisheries, and run numbers by week of Chignik Management Area sockeye salmon, 1988.

Stat. Week	Date Calendar	Chignik Escapement Weekly	Chignik Escapement Cum.	Catch: Chignik Management Area Districts: Chignik Bay	Central	Eastern	Western	Perryville	Totals	Interception Areas[a]: Stepovak/ Beaver	Cape Igvak	Total Catch	Run
22	5/22-5/28	0	0	0	0	0	0	0	0	0	0	0	0
23	5/29-6/04	609	609	0	0	0	0	0	0	0	0	0	609
24	6/05-6/11	17,723	18,332	801	0	0	0	0	801	0	0	801	18,524
25	6/12-6/18	99,485	117,817	832	0	0	0	0	832	0	0	832	100,317
26	6/19-6/25	206,852	324,669	1,375	417	0	0	0	1,792	0	0	1,792	208,644
27	6/26-7/02	103,552	428,221	73,346	15,404	3,438	0	0	92,188	0	0	92,188	195,740
28	7/03-7/09	42,435	470,656	117,148	23,997	14,503	28,006	6,359	190,013	0	0	190,013	232,448
29	7/10-7/16	66,699	537,355	121,031	32,437	4,690	20,767	7,025	185,950	2,367	0	188,317	255,016
30	7/17-7/23	52,592	589,947	99,835	40,479	0	29,208	3,767	173,289	3,010	0	176,299	228,891
31	7/24-7/30	34,043	623,990	24,035	5,622	239	6,121	2,492	38,509	32,914	20,286	91,709	125,752
32	7/31-8/06	23,082	647,072	18,176	782	1,375	3,289	2,255	25,877	21,802	2,885	50,563	73,645
33	8/07-8/13	28,685	675,757[b]	8,263	2,034	921	2,315	1,285	14,818	4,133	2,780	21,731	50,416
34	8/14-8/20			10,866	1,255	487	1,232	246	14,086	0	1,715	15,801	15,801
35	8/21-8/27			19,614	1,436	46	32	0	21,128	0	14	21,142	21,142
36	8/28-9/03			13,251	240	0	1,897	0	15,388	1,417	0	16,805	16,805
37	9/04-9/10			5,303	0	0	203	0	5,506	8,614	0	14,120	14,120
38	9/11-9/17			6,573	0	0	0	0	6,573	4,229	0	10,802	10,802
39	9/18-9/24			7,393	0	0	0	0	7,393	254	0	7,647	7,647
40	9/25-10/1			1,287	0	0	0	0	1,287	362	0	1,649	1,649
41	10/2-10/8			411	0	0	0	0	411	0	0	411	411
Totals		675,757		529,540	124,103	25,699	93,070	23,429	795,841	79,101	27,682	902,624	1,578,381

[a] In the intercepetion fisheries an assumed 80% of the sockeye salmon caught are CMA fish. The numbers presented are the 80% levels.

[b] Chignik weir was removed on 9 August; the post weir escapement was an estimated 21,133 fish which is included in the week 33 count.

Table 9. Age composition of sockeye catch samples from the Chignik Bay District, 1988.

Stat. Week	Date Calendar		Ages 0.1	0.2	0.3	0.4	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	3.2	3.3	Total
24	11-Jun	N	0	0	3	0	0	34	340	2	0	10	181	0	0	0	570
		%	0.0	0.0	0.5	0.0	0.0	6.0	59.6	0.4	0.0	1.8	31.8	0.0	0.0	0.0	100.0
25	14-Jun	N	0	0	2	0	0	34	321	3	0	6	191	0	0	0	557
		%	0.0	0.0	0.4	0.0	0.0	6.1	57.6	0.5	0.0	1.1	34.3	0.0	0.0	0.0	100.0
26	20-Jun	N	0	0	1	0	0	59	298	2	0	11	190	1	0	0	562
		%	0.0	0.0	0.2	0.0	0.0	10.5	53.0	0.4	0.0	2.0	33.8	0.2	0.0	0.0	100.0
26	25-Jun	N	0	0	0	0	0	56	227	1	0	39	198	0	0	0	521
		%	0.0	0.0	0.0	0.0	0.0	10.7	43.6	0.2	0.0	7.5	38.0	0.0	0.0	0.0	100.0
27	30-Jun	N	0	0	1	0	1	17	55	3	0	12	100	1	0	1	191
		%	0.0	0.0	0.5	0.0	0.5	8.9	28.8	1.6	0.0	6.3	52.4	0.5	0.0	0.5	100.0
27	01-Jul	N	2	1	2	1	1	30	113	1	1	26	166	4	0	0	348
		%	0.6	0.3	0.6	0.3	0.3	8.6	32.5	0.3	0.3	7.5	47.7	1.1	0.0	0.0	100.0
28	07-Jul	N	0	0	0	0	0	21	61	0	7	44	415	0	0	0	548
		%	0.0	0.0	0.0	0.0	0.0	3.8	11.1	0.0	1.3	8.0	75.7	0.0	0.0	0.0	100.0
28	09-Jul	N	0	0	0	0	1	11	82	0	7	39	415	0	0	0	555
		%	0.0	0.0	0.0	0.0	0.2	2.0	14.8	0.0	1.3	7.0	74.8	0.0	0.0	0.0	100.0
29	14-Jul	N	0	0	0	0	0	17	89	0	1	44	366	0	0	0	517
		%	0.0	0.0	0.0	0.0	0.0	3.3	17.2	0.0	0.2	8.5	70.8	0.0	0.0	0.0	100.0
30	18-Jul	N	0	0	0	0	0	14	81	0	5	42	372	0	0	0	514
		%	0.0	0.0	0.0	0.0	0.0	2.7	15.8	0.0	1.0	8.2	72.4	0.0	0.0	0.0	100.0
30	22-Jul	N	0	0	0	0	0	13	36	0	2	46	442	0	0	0	539
		%	0.0	0.0	0.0	0.0	0.0	2.4	6.7	0.0	0.4	8.5	82.0	0.0	0.0	0.0	100.0
31	25-Jul	N	0	0	0	0	0	6	35	1	2	50	441	0	0	0	535
		%	0.0	0.0	0.0	0.0	0.0	1.1	6.5	0.2	0.4	9.3	82.4	0.0	0.0	0.0	100.0
32	02-Aug	N	0	0	0	0	1	13	25	0	15	73	295	1	0	0	423
		%	0.0	0.0	0.0	0.0	0.2	3.1	5.9	0.0	3.5	17.3	69.7	0.2	0.0	0.0	100.0
32	04-Aug	N	0	0	0	0	0	6	31	0	30	144	501	0	0	0	712
		%	0.0	0.0	0.0	0.0	0.0	0.8	4.4	0.0	4.2	20.2	70.4	0.0	0.0	0.0	100.0
33	12-Aug	N	0	0	0	0	1	13	11	0	10	53	118	0	0	0	206
		%	0.0	0.0	0.0	0.0	0.5	6.3	5.3	0.0	4.9	25.7	57.3	0.0	0.0	0.0	100.0
34	14-Aug	N	0	0	0	0	0	6	12	0	4	64	209	0	0	0	295
		%	0.0	0.0	0.0	0.0	0.0	2.0	4.1	0.0	1.4	21.7	70.8	0.0	0.0	0.0	100.0
34	20-Aug	N	0	0	0	0	0	1	2	0	2	16	55	0	0	0	76
		%	0.0	0.0	0.0	0.0	0.0	1.3	2.6	0.0	2.6	21.1	72.4	0.0	0.0	0.0	100.0
35	25-Aug	N	0	0	0	0	2	7	24	0	12	142	362	0	0	0	549
		%	0.0	0.0	0.0	0.0	0.4	1.3	4.4	0.0	2.2	25.9	65.9	0.0	0.0	0.0	100.0
36	01-Sep	N	0	0	1	0	0	3	13	0	1	91	191	0	1	0	301
		%	0.0	0.0	0.3	0.0	0.0	1.0	4.3	0.0	0.3	30.2	63.5	0.0	0.3	0.0	100.0
	Totals	N	2	1	10	1	7	361	1,856	13	99	952	5,208	7	1	1	8,519
		%	0.0	0.0	0.1	0.0	0.1	4.2	21.8	0.2	1.2	11.2	61.1	0.1	0.0	0.0	100.0

Table 10. Estimated escapement, catch, and run numbers of sockeye salmon by age class for the Black Lake and Chignik Lake stocks based on scale pattern analysis, 1988.

Stock	Ages													Total
	0.2	1.1	0.3	1.2	2.1	1.3	2.2	1.4	2.3	3.2	2.4	3.3	Other	
Black Lake														
Escap.														
No.	35	220	888	35,394	456	172,232	18,181	1,708	190,609	0	576	171	107	420,577
%	0.0	0.1	0.2	8.4	0.1	41.0	4.3	0.4	45.3	0.0	0.1	0.0	0.0	100.0
Catch														
No.	121	281	337	10,754	1,738	37,540	19,294	425	201,081	0	536	88	359	272,554
%	0.0	0.1	0.1	3.9	0.6	13.8	7.1	0.2	73.8	0.0	0.2	0.0	0.1	100.0
Run														
No.	156	501	1,225	46,148	2,194	209,772	37,475	2,133	391,690	0	1,112	259	466	693,131
%	0.0	0.1	0.2	6.7	0.3	30.3	5.4	0.3	56.5	0.0	0.2	0.0	0.1	100.0
Chignik Lake														
Escap.														
No.	25	186	221	12,300	2,554	68,862	25,416	446	144,790	6	251	47	76	255,180
%	0.0	0.1	0.1	4.8	1.0	27.0	10.0	0.2	56.7	0.0	0.1	0.0	0.0	100.0
Catch														
No.	73	503	331	18,109	8,170	79,281	84,391	294	438,114	154	398	27	225	630,070
%	0.0	0.1	0.1	2.9	1.3	12.6	13.4	0.0	69.5	0.0	0.1	0.0	0.0	100.0
Run														
No.	98	689	552	30,409	10,724	148,143	109,807	740	582,904	160	649	74	301	885,250
%	0.0	0.1	0.1	3.4	1.2	16.7	12.4	0.1	65.8	0.0	0.1	0.0	0.0	100.0
Combined														
Escap.														
No.	60	406	1,109	47,694	3,010	241,094	43,597	2,154	335,399	6	827	218	183	675,757
%	0.0	0.1	0.2	7.1	0.4	35.7	6.5	0.3	49.6	0.0	0.1	0.0	0.0	100.0
Catch														
No.	194	784	668	28,863	9,908	116,821	103,685	719	639,195	154	934	115	584	902,624
%	0.0	0.1	0.1	3.2	1.1	12.9	11.5	0.1	70.8	0.0	0.1	0.0	0.1	100.0
Run														
No.	254	1,190	1,777	76,557	12,918	357,915	147,282	2,873	974,594	160	1,761	333	767	1,578,381
%	0.0	0.1	0.1	4.9	0.8	22.7	9.3	0.2	61.7	0.0	0.1	0.0	0.0	100.0

Table 11. Length composition of sockeye salmon from the Chignik Bay District catch, by age and sex, 1988.

	Ages														
	0.1	0.2	1.1	0.3	1.2	2.1	0.4	1.3	2.2	1.4	2.3	3.2	2.4	3.3	Total
Females															
Mean Length	0	0	0	575	516	0	0	572	516	607	576	0	578	595	568
SE	-	-	-	12	3	-	-	1	2	10	0	-	8	-	0
Range	0-0	0-0	0-0	542-613	392-598	0-0	0-0	470-648	430-599	572-639	460-671	0-0	563-591	595-595	392-671
Sample Size	0	0	0	5	137	0	0	1,111	320	6	2,701	0	3	1	4,284
Males															
Mean Length	386	560	339	557	486	341	644	600	505	612	604	523	606	0	576
SE	4	-	10	41	3	3	-	1	2	11	1	-	13	-	1
Range	382-390	560-560	315-375	436-605	380-635	308-390	644-644	415-695	400-643	565-641	410-683	523-523	567-624	0-0	308-695
Sample Size	2	1	5	4	213	63	1	681	418	7	1,774	1	4	0	3,174
All Fish															
Mean Length	386	560	339	567	498	341	644	583	510	609	587	523	594	595	572
SE	4	-	10	18	2	3	-	1	2	7	0	-	10	-	1
Range	382-390	560-560	315-375	436-613	380-635	308-390	644-644	415-695	400-643	565-641	410-683	523-523	563-624	595-595	308-695
Sample Size	2	1	5	9	350	63	1	1,792	738	13	4,475	1	7	1	7,458

Table 12. Age composition of the Black Lake sockeye salmon escapement samples by sample date, 1988.

DATE		Ages 0.2	0.3	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	Total
06-24-88	N	0	0	0	4	19	0	0	0	13	0	36
	%	0.0	0.0	0.0	11.1	52.8	0.0	0.0	0.0	36.1	0.0	100.0
06-25-88	N	0	2	0	18	84	1	0	3	86	0	194
	%	0.0	1.0	0.0	9.3	43.3	0.5	0.0	1.5	44.3	0.0	100.0
06-27-88	N	0	4	1	46	302	4	1	10	163	0	531
	%	0.0	0.8	0.2	8.7	56.9	0.8	0.2	1.9	30.7	0.0	100.0
06-28-88	N	0	8	3	39	289	17	3	25	215	1	600
	%	0.0	1.3	0.5	6.5	48.2	2.8	0.5	4.2	35.8	0.2	100.0
06-29-88	N	1	6	0	61	260	6	0	31	210	1	576
	%	0.2	1.0	0.0	10.6	45.1	1.0	0.0	5.4	36.5	0.2	100.0
Composite		1	20	4	168	954	28	4	69	687	2	1937
		0.1	1.0	0.2	8.7	49.3	1.4	0.2	3.6	35.5	0.1	100.0

Table 13. Length composition of the Black Lake sockeye salmon escapement by age and sex, 1988.

	Ages										
	0.2	1.1	0.3	1.2	2.1	1.3	2.2	1.4	2.3	2.4	Total
Females											
Mean Length	0	0	568	518	0	574	536	597	573	552	571
SE	-	-	6	5	-	1	12	6	1	-	1
Range	0-0	0-0	535-620	461-610	0-0	350-662	428-586	550-631	485-694	552-552	350-694
Sample Size	0	0	15	38	0	597	14	15	428	1	1,108
Males											
Mean Length	521	342	587	475	334	601	560	614	605	648	577
SE	-	23	43	5	13	2	10	8	2	-	2
Range	521-521	307-411	418-652	400-625	306-365	460-688	435-695	561-665	473-675	648-648	306-695
Sample Size	1	4	5	129	4	350	54	13	256	1	817
All Fish											
Mean Length	521	342	573	485	334	584	555	605	585	600	574
SE	-	23	11	4	13	1	8	5	1	48	1
Range	521-521	307-411	418-652	400-625	306-365	350-688	428-695	550-665	473-694	552-648	306-695
Sample Size	1	4	20	167	4	947	69	28	684	2	1,926

Table 14. Estimated total sockeye, pink, and chum salmon escapement by district and stream, Chignik Management Area, 1988.

District Stream	Number of fish Sockeye	 Pink	 Chum
Chignik Bay District			
271-100	675,757[a]		
271-101a			
271-101b		20,000	13,483
271-102a			
271-102b		78	
271-102c		227	
271-103			
271-104		1,173	917
271-105		11	
271-106		928	853
Subtotal	675,757	22,417	15,253
Central District			
272-201			
272-202			
272-202a			
272-202b			
272-204		9,600	3,307
272-205		8,533	3,093
272-206		1,280	53
272-302		26,397	720
272-501		18,000	
272-502			
272-502a			
272-503			
272-504			
272-505			773
272-506		180	12,000
272-507		2,020	
272-508		7,189	
272-509		34,947	16,633
272-510		7,240	0
272-511			
272-511a		15,833	0
272-511b		0	0
272-512		637	0

-Continued-

Table 14. (page 2 of 4)

District Stream	Number of fish Sockeye	Pink	Chum
Central District (continued)			
272-514		48,540	16,990
272-516		35,959	2,280
Subtotal	0	216,355	55,849
Eastern District			
272-602		17,633	2,667
272-604		23,020	1,100
272-605	6,200	95,100	17,425
272-606		109,000	0
272-701		13,880	17,600
272-702		43,617	5,500
272-703		41,401	10,587
272-704			
272-720			
272-721		33,703	30,267
272-801		32,840	12,848
272-802	20	9,707	11,947
272-803		68,000	14,967
272-804		16,794	8,000
272-805		23,000	8,000
272-900		15,380	1,000
272-901		14,470	0
272-902		33,683	0
272-903		12,600	13,177
272-903a			
272-903b			
272-904		40,000	30,000
272-905		52,897	14,387
272-906			
272-921		75,000	1,527
272-922		0	0
272-923	20	807	257
272-961		17,000	
272-961a			
272-961b		78,000	20,613
272-961c			
272-962			
272-962a		0	0

-Continued-

Table 14. (page 3 of 4)

District Stream	Number of fish Sockeye	 Pink	 Chum
Eastern District (continued)			
272-962b		45	0
272-963		137,828	
Subtotal	6,240	1,005,405	221,869
Western District			
273-702		135,593	10,600
273-720			
273-722		57,000	5,576
273-723		6,000	800
273-802		13,000	903
273-821		0	200
273-822		0	1,100
273-823		150	309
273-842		4,000	6,110
273-843		0	760
273-844		0	500
273-845		0	500
273-941		16,700	20
Subtotal	0	232,443	27,378
Perryville District			
275-401		5,100	
275-402		900	1,025
275-403			
275-404		14,000	1,100
275-405		0	1,300
275-406		126,000	30,564
275-408			
275-502		30,767	400
275-503			
275-504			3,000
275-505		4,500	0
275-506			

-Continued-

Table 14. (page 4 of 4)

District Stream	Number of fish Sockeye	Pink	Chum
275-600			
275-601		0	4,000
Subtotal	0	181,267	41,389
Grand Total	681,997	1,657,887	361,738

[a] Escapement enumerated at the Chignik River weir from 27 May through 8 August including the post 8 August estimated escapement of 166,202 fish.

Table 15. Age composition of coho salmon catch samples from the Chignik Bay District, 1988.

Date Stat. Wk.	Calendar		Ages 1.1	2.1	3.1	Total
34	08/20	N	6	9	0	15
		%	40.0	60.0	0.0	100.0
35	08/25	N	65	75	4	144
		%	45.1	52.1	2.8	100.0
36	09/01	N	128	165	4	297
		%	43.1	55.6	1.3	100.0
	Composite	N	199	249	8	456
		%	43.6	54.6	1.8	100.0

Table 16. Length composition of coho salmon from the Chignik Bay District catch, by age and sex, 1988.

	Ages			
	1.1	2.1	3.1	Total
Females				
Mean Length	586	606	612	598
SE	5	4	-	3
Range	447-664	495-674	612-612	447-674
Sample Size	67	95	1	163
Males				
Mean Length	587	607	596	598
SE	4	3	17	2
Range	472-682	474-692	520-650	472-692
Sample Size	131	154	7	292
All Fish				
Mean Length	587	606	598	598
SE	3	3	15	2
Range	447-682	474-692	520-650	447-692
Sample Size	198	249	8	455

Table 17. Percent age composition of the Black Lake sockeye salmon escapement based on scale pattern analysis and escapement sampled at the outlet of Black Lake, 1986-88.

Year	Method	Ages												
		0.2	0.3	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	3.2	3.3	Other
1986														
	SPA	0.0	0.0	0.0	9.4	51.7	0.1	0.1	3.5	35.0	0.0	0.1	0.0	0.1
	Black L. Outlet	0.1	1.6	0.1	11.4	67.3	0.4	0.1	2.2	16.9	0.0	0.0	0.0	0.0
1987														
	SPA	0.0	0.8	0.1	3.4	65.1	0.2	0.1	5.2	25.0	0.0	0.0	0.1	0.0
	Black L. Outlet	0.0	1.0	0.0	4.8	74.7	0.1	0.0	2.2	17.0	0.0	0.0	0.0	0.0
1988														
	SPA	0.0	0.2	0.1	8.4	41.0	0.4	0.1	4.3	45.3	0.1	0.0	0.0	0.0
	Black L. Outlet	0.1	1.0	0.2	8.7	49.3	1.5	0.2	3.6	35.5	0.1	0.0	0.0	0.0

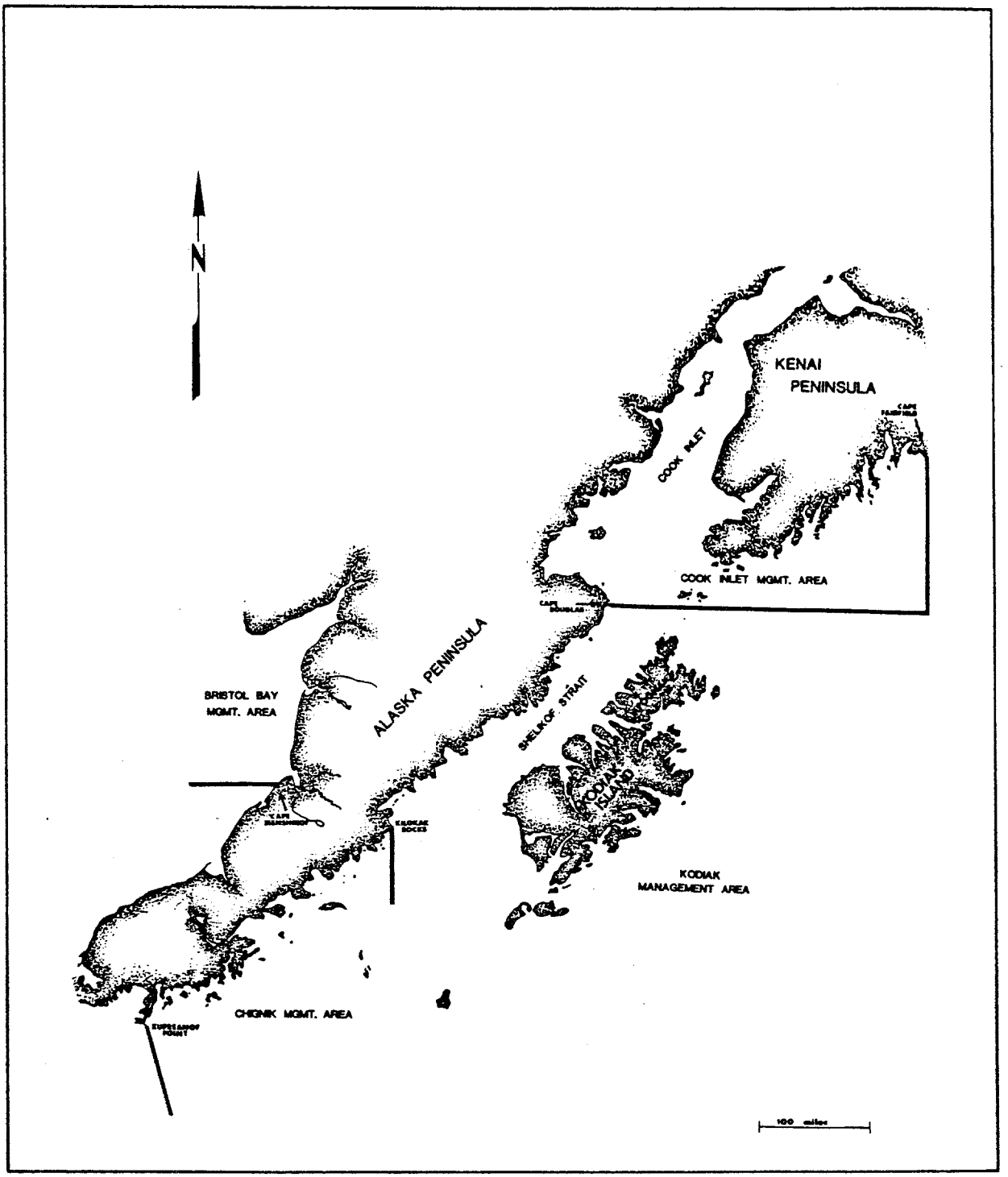

Figure 1. Map showing the location of the Chignik Management Area in relation to neighboring management areas.

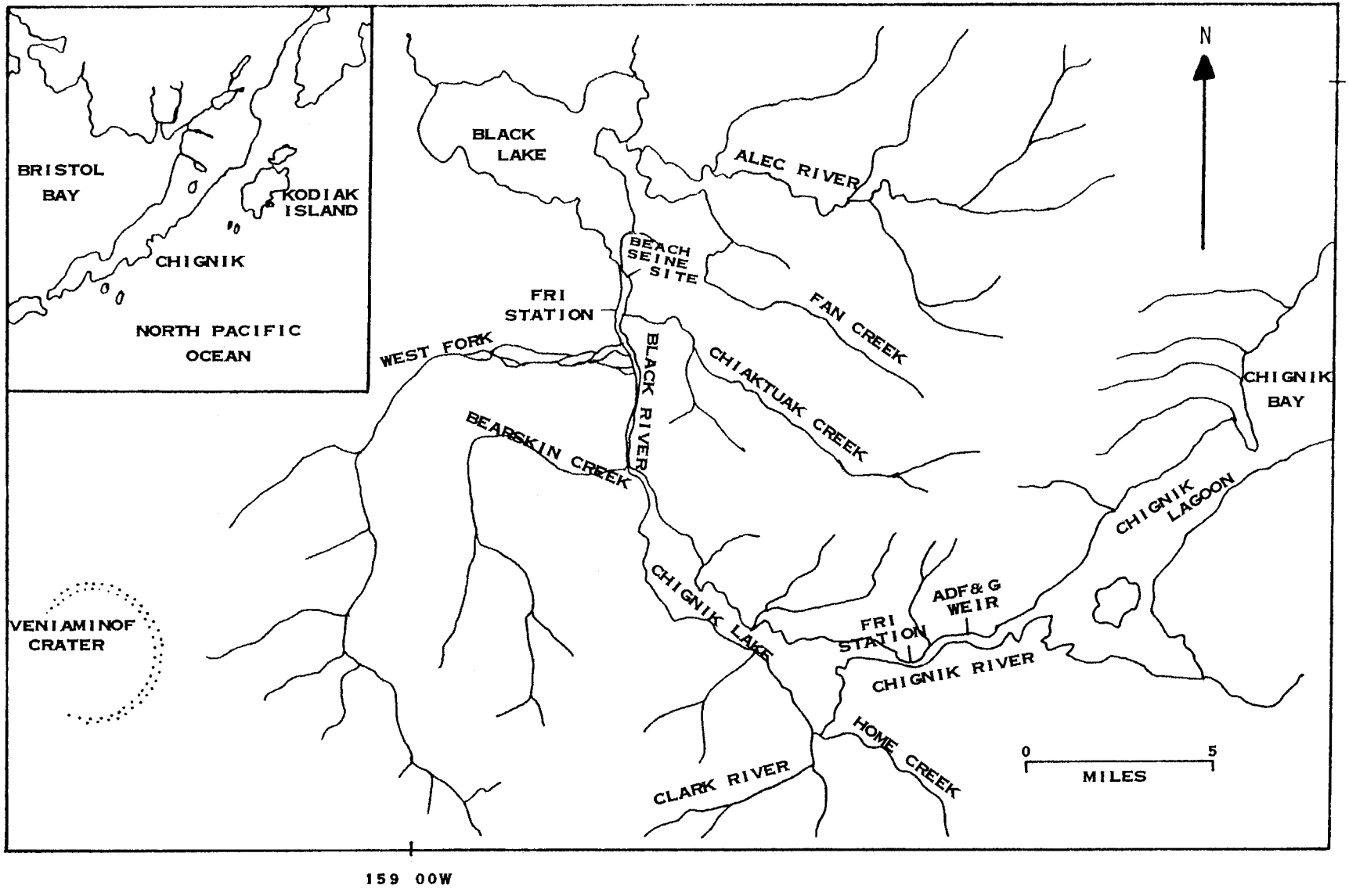

Figure 2. Map of the Chignik River drainage.

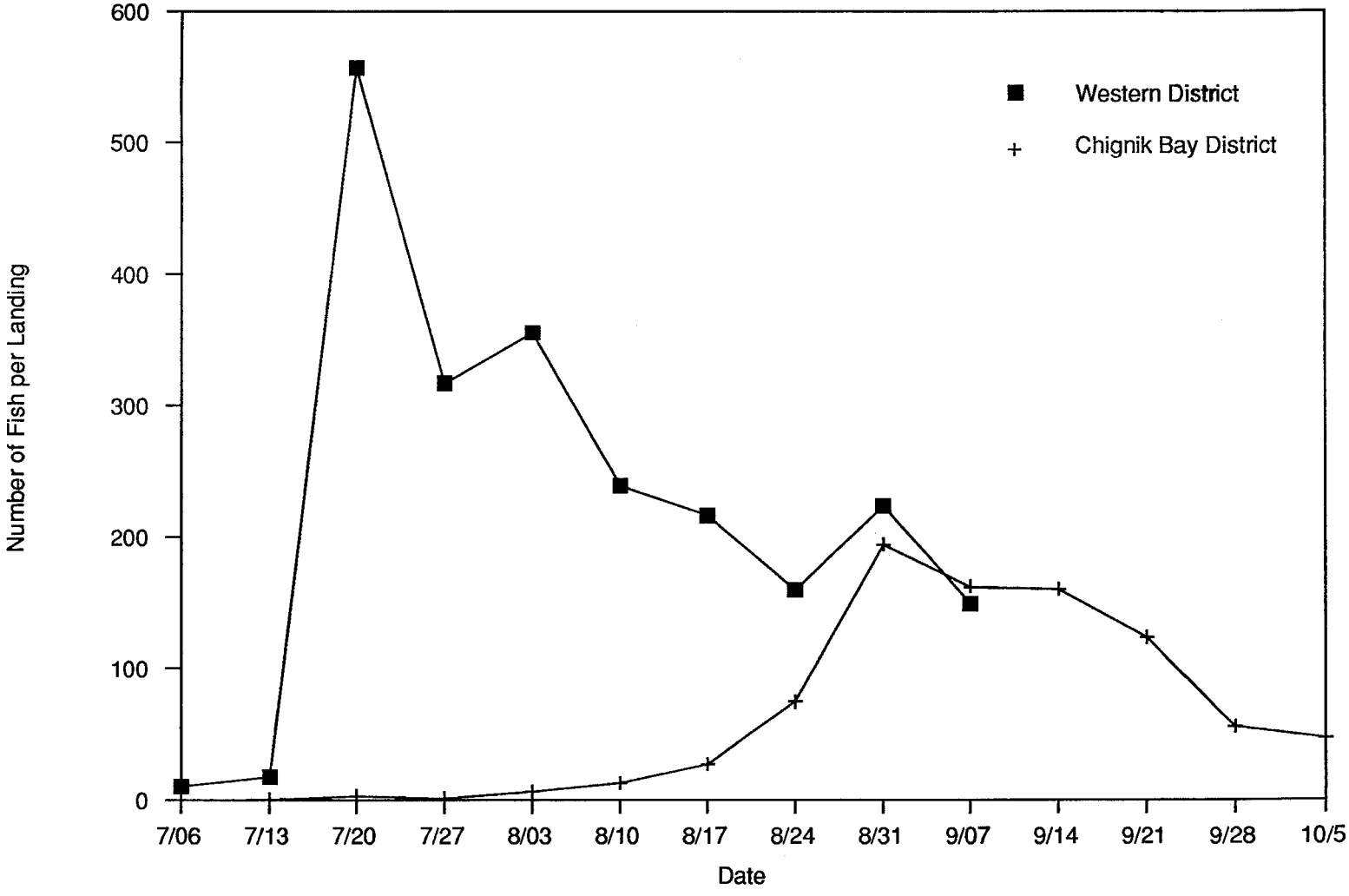

Figure 3. Average number of coho salmon caught per landing by week in the Western and Chignik Bay Districts of the Chignik Management Area, 1988.

Appendix A. 1988 statistical weeks.

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