1989

CHIGNIK MANAGEMENT AREA SALMON FISHERY

REPORT TO THE BOARD OF FISHERIES

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and

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TABLE OF CONTENTS

Page

CHIGNIK SALMON FISHERIES.....1
Introduction.....1
Overview of the 1989 Salmon Season.....1
Sockeye Salmon.....2
Background.....2
1989 Management.....3
Pink and Chum Salmon.....7
Chinook Salmon.....7
Coho Salmon.....7

LIST OF FIGURES

Figure Page

1. Map of the Alaska Peninsula illustrating the relative location of the Chignik Management Area...10

2. Map of the Chignik Management Area with the statistical fishing districts and some prominent locations.....11

3. Chignik Management Area salmon harvests from 1962-89...12

4. Economic value of Chignik Management Area salmon harvests from 1971-89 and estimated value of 1989 potential harvest.....13

5. Map illustrating the Chignik Lakes System.....14

6. Map illustrating waters of the Eastern District closed during the first Chignik fishing period.....15

7. In-season marker locations used to manage the 1989 Chignik salmon fishery.....16

8. First-run sockeye salmon catch and escapement, 1954-89.....17

9. Second-run sockeye salmon catch and escapement, 1954-89.....18

10. Chignik Management Area sockeye salmon catch and escapement, 1954-89.....19

ACE 9281475

LIST OF FIGURES (continued)

11. Chignik Management Area pink salmon catch and escapement, 1962-89.....20

12. Chignik Management Area chum salmon catch and escapement, 1962-89.....21

13. Chignik Management Area chinook salmon catch and escapement, 1963-89.....22

14. Chignik Management Area coho salmon catch and escapement, 1970-1989.....23

15. Coho salmon harvest, by 1988 stat week, for the Western plus Perryville Districts and Chignik Bay District.....24

16. Pink, chum and coho salmon catches in the Western and Perryville Districts, 1979-88.....25

17. Average percent harvest of coho salmon in the Chignik Area, by district, from 1979-87 and 1979-88.....26

18. Effort, in number of landings, in the Western and Perryville Districts from 1979 to 1988.....27

19. Coho salmon catches in the Western plus Perryville Districts and the Chignik Bay District, 1979-88...28

LIST OF TABLES

Table Page

1. Chignik Management Area salmon catches, 1970-89.....29

2. Chignik River System sockeye salmon escapement goals for Black Lake (early) and Chignik Lake (late) runs, by time period.....30

3. Chignik sockeye run catches, 1964-1989.....31

ACE 9281476

CHIGNIK AREA SALMON REPORT
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1989

Introduction

Description of Area

The Chignik commercial salmon management area encompasses all coastal waters and inland drainages of the northwest Gulf of Alaska between Kilokak Rocks and Kupreanof Point (Figure 1). The area includes the Chignik River system and approximately 90 other salmon producing streams.

The management area is divided into five districts which are, from east to west, the Eastern, Central, Chignik Bay, Western and Perryville Districts (Figure 2). Five species of Pacific Salmon are commercially harvested; they are chinook (*Oncorhynchus tshawytscha*), sockeye (*Oncorhynchus nerka*), pink (*Oncorhynchus gorbuscha*), coho (*Oncorhynchus kisutch*) and chum (*Oncorhynchus keta*) salmon. The Alaska Department of Fish and Game (ADF&G) manages all districts to achieve desired escapement goals for anadromous salmon species while allowing for the orderly harvest of fish surplus to spawning requirements.

Purse seines are the only legal gear type for the Chignik Area commercial salmon fishery. In 1989, 100 permit holders were active in the commercial salmon fisheries.

Overview of the 1989 Salmon Season

The total 1989 commercial salmon harvest was 1.25 million fish (Figure 3). The sockeye and chinook salmon harvests were within

ACE 9281477

predicted ranges while the harvest of pink and chum salmon were well below projections. This was due to the presence of oil in the outside districts of the Chignik Management Area which precluded fishing in these waters. Coho salmon catches were lower than projected for 1989 (Table 1).

The ex-vessel actual value of the 1989 commercial salmon harvest was estimate at 13.6 million dollars based on the average price per pound paid to fishermen. The value of the Chignik commercial salmon fishery, based on harvest of local stocks, had there been no closures due to oil was an estimated 18.8 million dollars (Figure 4).

Sockeye Salmon

Background Information

Economically, sockeye salmon are the most important commercial species in the Chignik Management Area. The local commercial fishery targets on sockeye salmon entering the Chignik Lakes system. Sockeye salmon of Chignik Lakes system origin are also intercepted outside the Chignik area in the Kodiak and Alaska Peninsula management areas.

Sockeye salmon returning to the Chignik Lakes system are comprised of two stocks one returning to Black Lake (early run) and the other to Chignik Lake (late run) (Figure 5). The ADF&G established the sockeye salmon escapement goals for Black Lake and Chignik Lake stocks at 400,000 and 250,000 fish, respectively. Commercial fishing time for sockeye salmon has been predicated on achieving a threshold level of escapement for each run by a specific date. Monitoring escapement with respect to achieving these threshold levels is complicated by an overlap in early and late run time of entry called the transition period. The transition period generally occurs from the last of June through mid-July. Two methods have been developed to estimate

ACE 9281478

daily proportions of each run during the transition period.

The first method is based on tagging studies from 1962-1966. These studies enabled biologists to develop an average time of entry curve (ATOE) to apportion the Chignik sockeye runs into early and late components. This method is currently used for in-season management of the fishery.

The second method, developed in the early 1980's, is based on differences in scale patterns between fry rearing in Black Lake and fry rearing in Chignik Lake. Sockeye fry rearing in Black Lake (early run) emerge earlier and grow at a faster rate than sockeye fry rearing in Chignik Lake (late run). The faster growth rate experienced by Black Lake fry allow the majority to attain smolt length at age I, while sockeye fry rearing in Chignik Lake experience a slower growth rate and generally smolt at age II. Historically, this has been recognized in the adult return. The runs to Black Lake have been characterized by the dominance of age 1.3 fish, while the Chignik Lake returns have been primarily age 2.3 fish. These differences in early life histories are reflected in scale patterns and supply the discriminating variables used in the scale pattern analysis (SPA) program. In-season ATOE run separation results are discarded in preference of final post-season SPA allocations.

1989 Management

The Chignik River weir, located approximately three miles from Chignik Lagoon, was operational on May 27. The first sockeye salmon fishing period is allowed when the cumulative escapement through the weir prior to June 12 is a minimum 40,000 fish and there is indication of a buildup in Chignik Lagoon. Interim escapement goals have been established for June and July to facilitate achieving the 400,000 and 250,000 fish respective escapement goals for Black and Chignik Lakes, (Table 2).

ACE 9281479

The 1989 Chignik sockeye salmon fishery started on June 12. Test fishing on June 11 indicated a moderate buildup in Chignik Lagoon and the escapement of 56,400 sockeye past the weir was within the desired range for this date. The Chignik Bay, Central and Eastern Districts were opened for 24 hours from 11:00 am June 12 to 11:00 am June 13. However, the presence of oil contaminated waters or beaches near Kilokak Rocks and the lack of associated monitoring in the Chignik Management Area dictated that waters of the Eastern District north of 56 degrees 59 minutes N. latitude remain closed to fishing (Figure 6). The harvest for this period was approximately 59,000 sockeye salmon.

Escapement counts lagged after the first fishing period just meeting interim goals. Test fishing on June 15 and 20 indicated that there was not enough buildup in the lagoon to justify a commercial fishery. This is the second year in a row that the Black Lake run has failed to develop as expected. On June 25 test fishing revealed a moderate buildup in the lagoon and the cumulative weir count was 341,600 fish. Age class composition of the test fishery catch samples were predominantly 1.3 fish (early run) therefore a 24 hour fishing period was announced for 9:00 am June 26 until 9:00 am June 27. The fishery was restricted to the Chignik Bay District because the presence of oil contaminated waters or beaches in the Eastern and Central Districts dictated that normal management strategies be altered. For the remainder of the 1989 season commercial salmon fishing was restricted to the vicinity of Chignik Lagoon (Figure 7).

The F/V Marci LeRae, operating under the direction of the ADF&G oil monitoring project leader, entered the Eastern District on June 11. As they moved west, oil and sheen were observed in waters of the Eastern and Central Districts. On June 26, during the commercial fishery in Chignik Lagoon, the F/V Marci LeRae

ACE 9281480

reported sighting oil in Chignik Bay at Anguvik Island. The low level of monitoring in the Chignik Management Area coupled with the approach of darkness resulted in closure of the fishery at 10:00 pm June 26, thirteen hours into the opener. The harvest for the 13 hours fished was 64,600 sockeye salmon.

Although oil was reported in Chignik Bay the amount of contamination (sheen) in Chignik Lagoon did not appear to exceed a level associated with more than 100 vessels operating within a confined area and a fishing period was scheduled for 3:00 pm until 12:00 midnight on June 30 and July 1. Due to the presence of oil contaminated beaches or waters in the immediate vicinity of Chignik Lagoon a policy of fishing in daylight hours only was adopted. The harvest for this period was 54,700 sockeye salmon.

The ATOE curve is used in-season to determine the daily percent composition of early and late run sockeye through the transition period. The 1989 model was completed on July 10 and indicated that by July 7 more than 50 percent of the fish entering the lagoon were late run.

The late run appeared to be coming in as forecast and a total of 13 fishing days in July resulted in a harvest of 472,100 sockeye salmon. The second run continued to show strength into the month of August and in 24 fishing days fishermen harvested 443,100 sockeye salmon.

Scheduled fishing periods were cancelled due to oil on July 27 and August 4. On July 26, a tender load of contaminated fish, approximately 20,000 pounds, was reported to ADF&G staff. While investigating the incident a heavy sheen of what appeared to be diesel oil 175 by 75 yards was observed. There was lighter sheen observed in the peripheral areas. Darkness prevented further surveillance. Due to the extensive nature of the sheen observed and no information as to the full extent of oil contamination the

ACE 9281481

fishery scheduled for July 27 was cancelled. Fishing resumed as scheduled on July 28. On August 4 oil from the Exxon Valdez spill, in the form of mousse, was located inside Chignik Lagoon and scheduled fishing periods on August 5 and 6 were cancelled. The fishery remained closed to allow assessment of total impact and by August 7 the late run escapement totalled 340,300 fish, 90,300 fish above the second run escapement goal. On August 7, in order to prevent potentially damaging over escapement levels, a barrier seine was deployed across Chignik River. On August 9 a co-op fishery in upper lagoon waters harvested approximately 30,000 sockeye salmon.

The fishery was reduced from a five day to a four day per week fishing schedule for the month of September because of a weak coho return. During 17 days of fishing in September fishermen harvested 76,000 sockeye salmon. The last delivery was on September 29.

The management plan for the Cape Igvak interception fishery was not inplemented in 1989 due to oil. The interception harvest at Balboa/Stepovak totalled only 3,000 sockeye prior to July 25 (Table 3). Post July 25 Balboa/Stepovak sockeye catches totalled 167,600 fish, almost twice (1.95 times) the 10 year average of 86,000 fish. This was probaly due to the late run timing of the Chignik Lake stocks. An estimated 80 percent of the post July Balboa/Stepovak sockeye catches or 134,080 fish were from the Chignik Lake run.

The Black Lake escapement totalled 383,200 fish, 16,800 fish below the 400,000 desired level but within the range of 375,000 to 425,000 fish (Figure 8). The Chignik Lake sockeye escapement was 557,900 fish, more than twice the desired 250,000 fish escapement level (Figure 9).

In summary, the total sockeye salmon run for both Chignik and

ACE 9281482

Black Lakes in 1989 was 2.23 million fish. This was within the forecast range of 1.68 to 2.52 million fish and above the point estimate of 2.10 million fish (Figure 10). However, the early run was much weaker than forecast and the late run was much stronger than forecast.

Pink and Chum Salmon

The 1989 pink and chum salmon fishery was severely restricted due to the presence of oil contaminated waters or beaches in the Eastern, Central, Western and Perryville Districts of the Chignik Management Area. Area wide pink salmon escapements totalled 1,434,800 fish, 2.97 times the 1963 to 1987 odd year average. The harvest of 27,700 pink salmon came from the Chignik Bay District (Figure 11).

The area wide chum salmon escapement was only 136,400 fish, 42,000 less than the 1962 to 1988 average. Given that there was no fishery in the outside districts, the 1989 chum run was very weak. A total of 1,600 chum were harvested in the Chignik Bay District (Figure 12).

Chinook Salmon

The chinook salmon harvest in 1989 totalled 3,542 fish. This was an average harvest based on catches from 1979-88 (Figure 13). The chinook escapement count through Chignik River weir was 3,316 fish.

Coho Salmon

The total production of coho salmon in the Chignik Area is unknown, primarily due to the late run timing which continues through November and the associated costs to enumerate coho escapement.

ACE 9281483

The total harvest of coho salmon in 1989 was 66,600 fish, well below the 1979-88 average (Figure 14). The entire 1989 harvest was from the Chignik Bay District. Catches of coho salmon were reported through September 29, the last fishing day.

Coho salmon spawn throughout the Chignik Area. However, most of the coho production comes from the Chignik Lakes system which is the largest producer in the Westward Region. Coho salmon start appearing in the commercial fishery in mid-July and are still present when the commercial fishery ends in October.

Coho normally enter the Chignik commercial fishery in a bimodal pattern (Figure 15). Early coho appear in late July during the targeted pink and chum fishery and late coho appear from the end of August through the remainder of the season. Early coho catches (first mode) occur in outside management areas, primarily the Western and Perryville districts. These coho salmon usually have a smaller average weight than those caught the end of August and September (second mode). Based on timing information and average weights an unknown portion of the early coho catch are considered to be non-local stocks. From mid-August through the end of the season (second mode) coho salmon are harvested primarily in the Chignik Bay District and are considered local stocks.

Coho salmon are not specifically managed for in mid-July. In the Western and Perryville Districts, coho are an incidental catch in a targeted pink and chum salmon fishery (Figure 16). The annual harvest of transient coho salmon is directly related to the strength of local pink and chum runs, the strength of the sockeye run and the abundance of coho. The coho harvest in 1988 was the largest on record. Coho salmon harvested in the Western and Perryville districts from 1979-87 averaged 37.3 percent of the total Chignik coho harvest (Figure 17). The 1988 harvest was an anomaly with 67.0 percent of the harvest coming from the Western

ACE 9281484

and Perryville districts, 22.7 percent more than the 1979-87 average.

Management of the Western and Perryville Districts is based on optimal utilization of local pink and chum stocks. Local processors process exclusively for the fresh frozen market. Fishing outside district capes during July and August allows harvest of fish with the necessary quality for the fresh frozen market. It also provides early assessment of pink and chum run strength for in-season management decisions.

The amount of effort in the outside districts is variable and depends on the strength of the sockeye run, strength of the pink and chum runs and the price paid for pink and chum salmon. Several factors contributed to the high Western and Perryville Districts coho catches in 1988. The early sockeye run failed to develop and the second run was below average. Additionally, a record return of pink salmon coupled with a high price per pound increased the level of effort in the outside districts (Figure 18).

The largest coho salmon producing system in the Chignik Area is the Chignik Lakes system. These fish are primarily harvested from mid-August to the end of the season in the Chignik Bay District (Figure 19). They are managed concurrent to late returning sockeye which have similar run timing. The amount of fishing time is based on the run strength of both coho and sockeye salmon.

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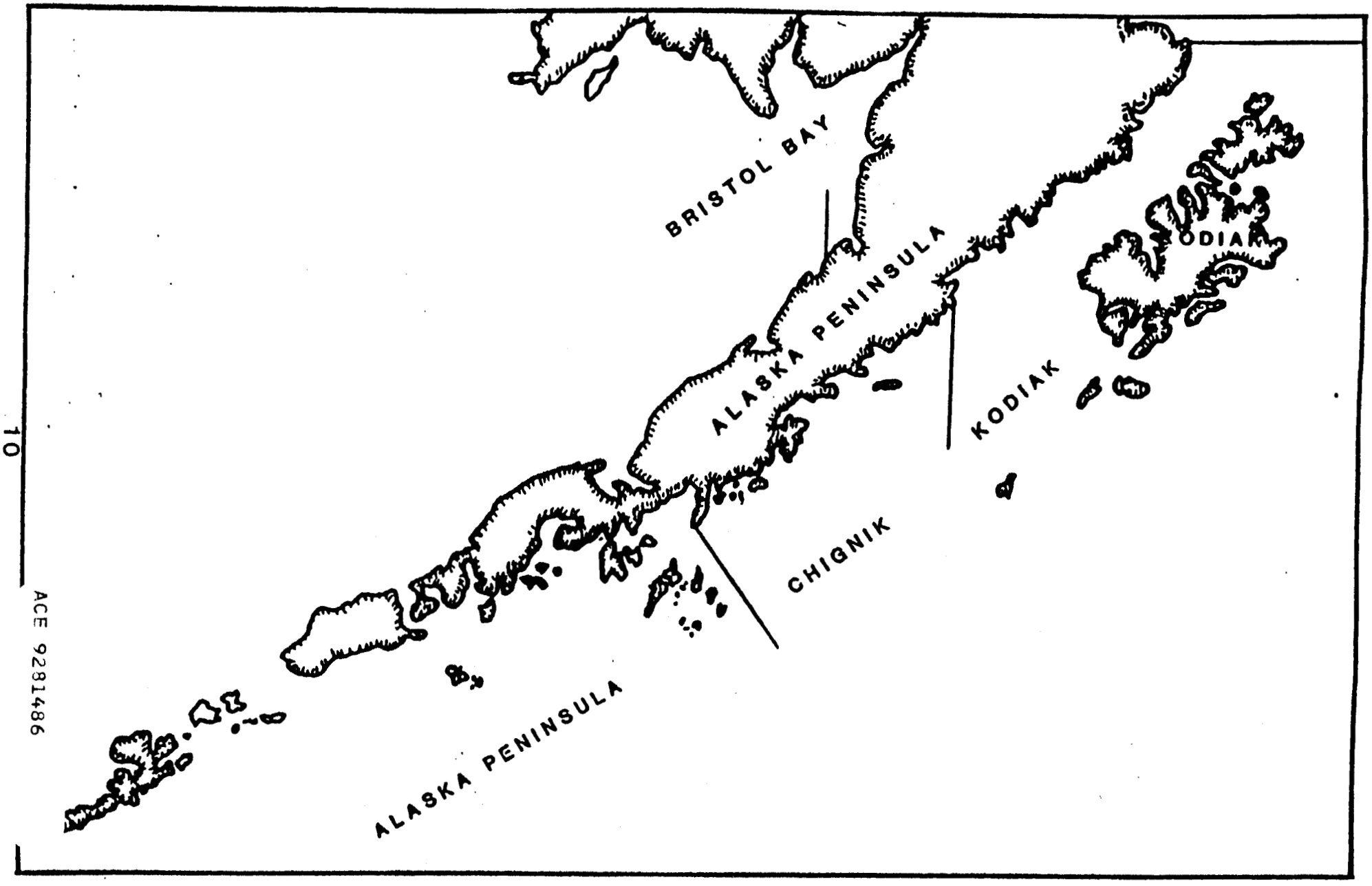

Figure 1. Map of the Alaska Peninsula illustrating the relative location of the Chignik Management Area.

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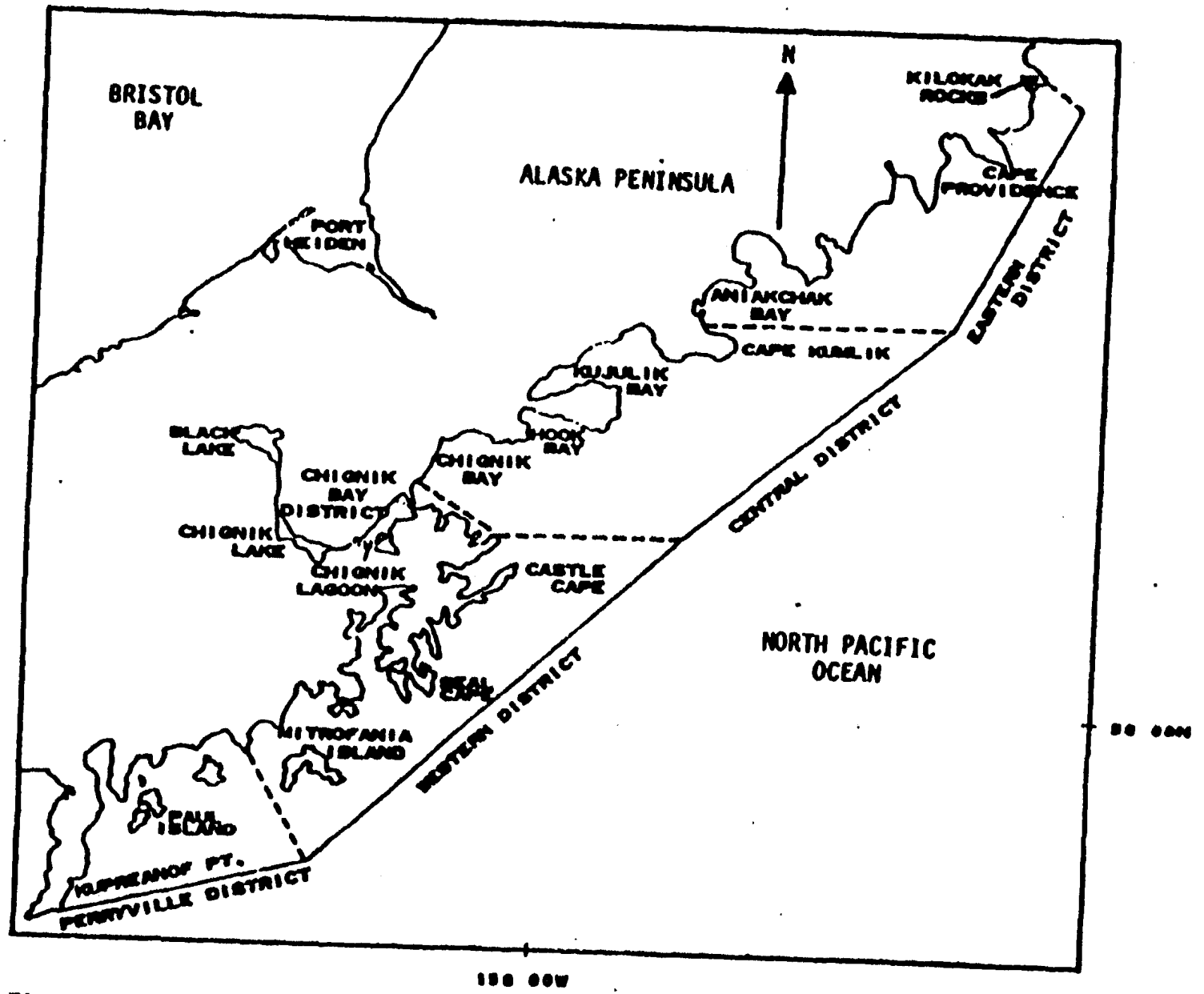

Figure 2. Map of the Chignik Management Area with the statistical fishing districts and some prominent locations identified.

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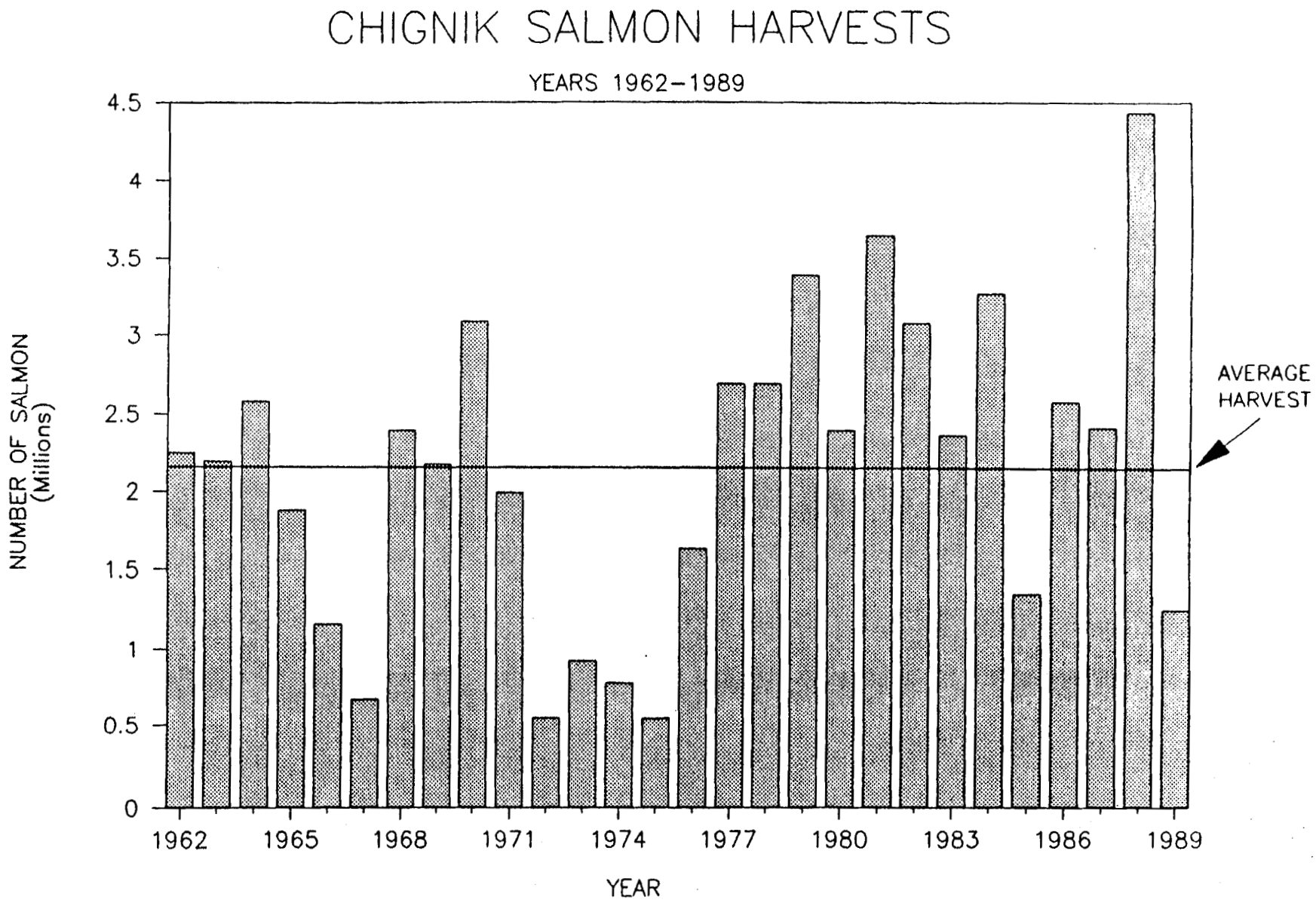

FIGURE 3. CHIGNIK MANAGEMENT AREA SALMON HARVESTS FROM 1962-89.

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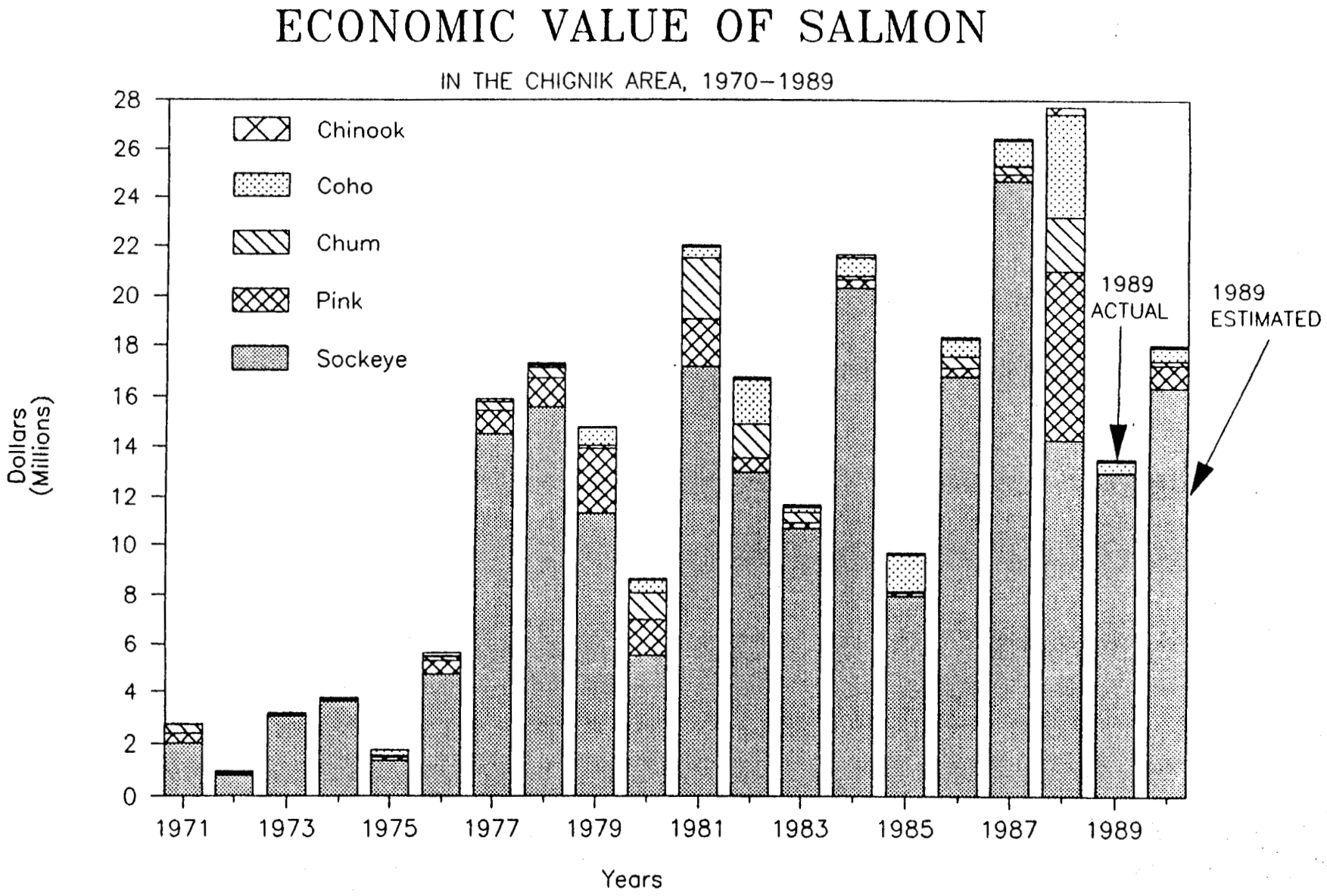

FIGURE 4. ECONOMIC VALUE OF CHIGNIK MANAGEMENT AREA SALMON HARVESTS FROM 1970 TO 1989 AND ESTIMATED VALUE OF 1989 POTENTIAL HARVEST

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CHIGNIK LAKES WATERSHED

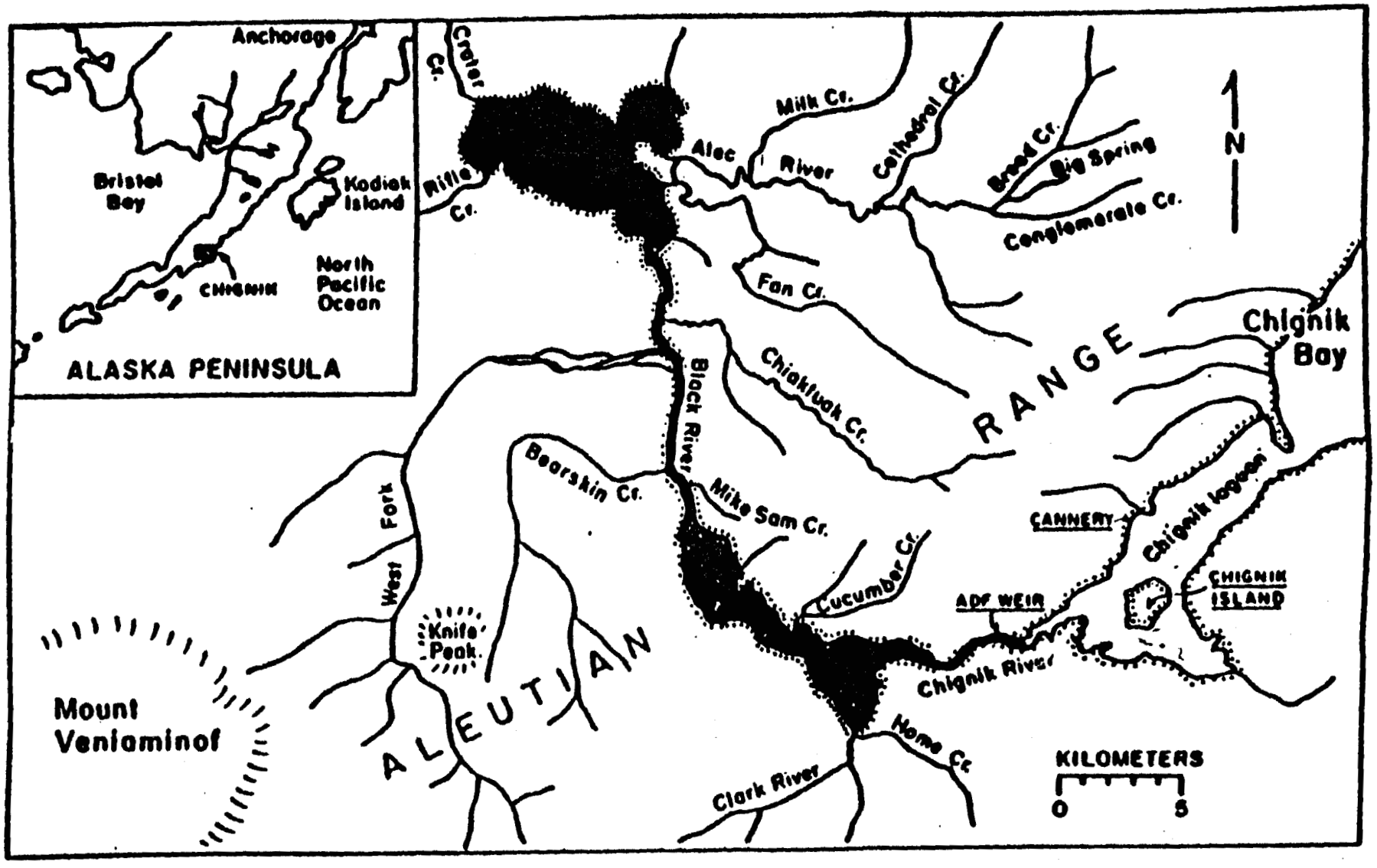

Figure 5. Map illustrating the Chignik Lakes System.

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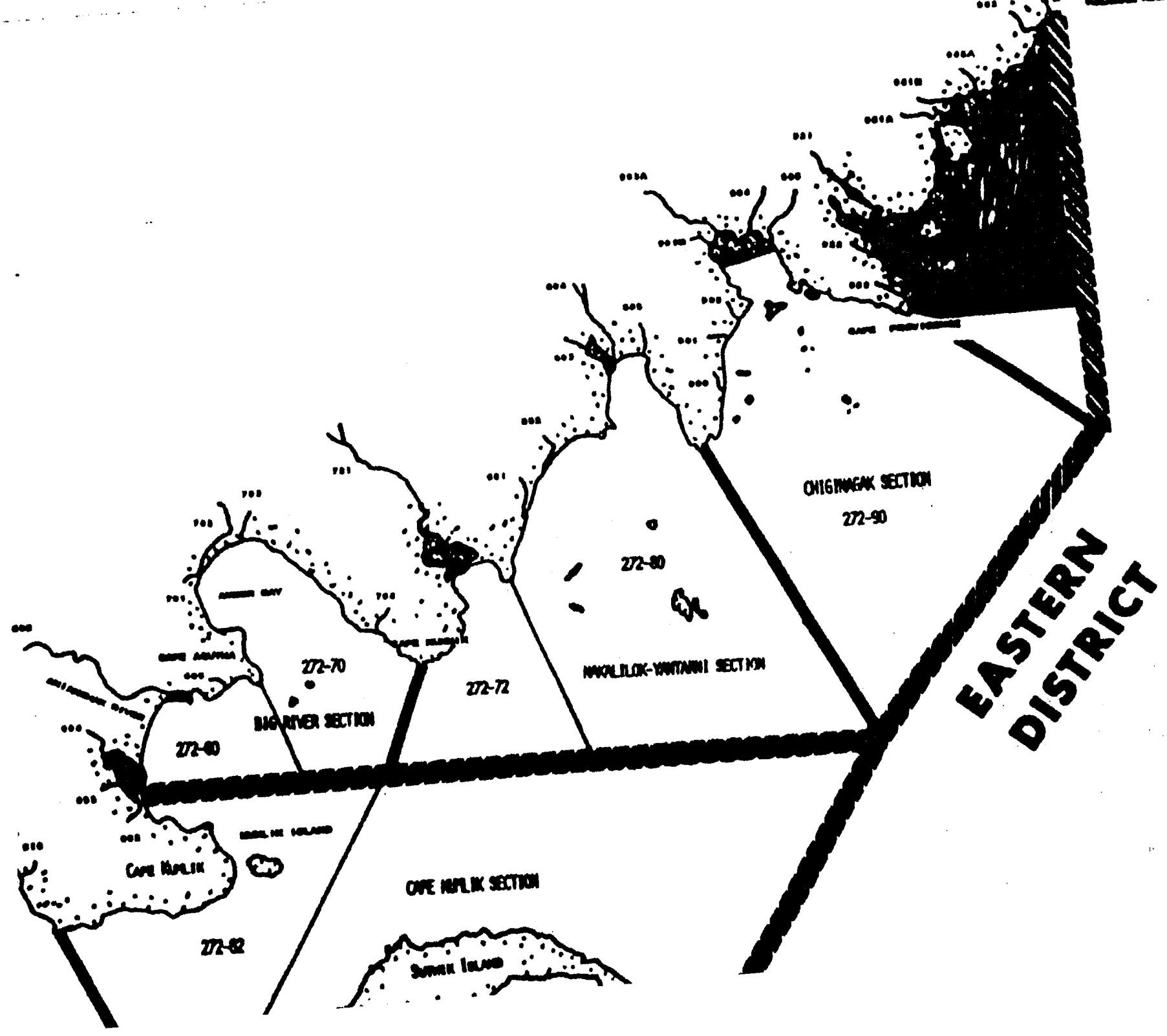
EASTERN DISTRICT
CHIGINAGAK SECTION
272-90
272-80
NAKALILOK-YANTARNI SECTION
272-72
272-70
BIG RIVER SECTION
272-60
CAPE KUPLIK
CAPE KUPLIK SECTION
272-82
SUTWIK ISLAND

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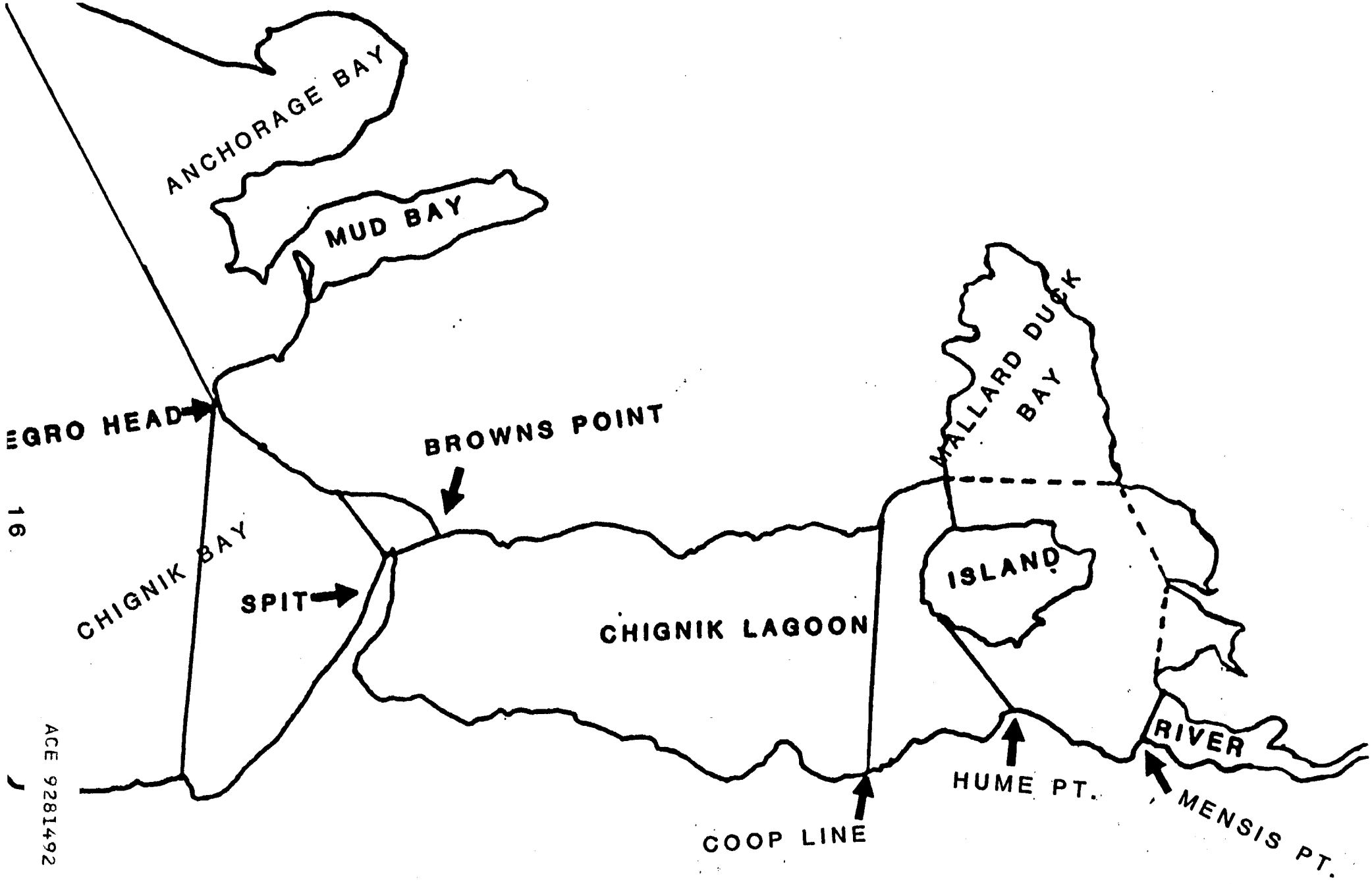

Figure 7. In-season marker locations used to manage the 1989 Chignik Salmon Fishery.

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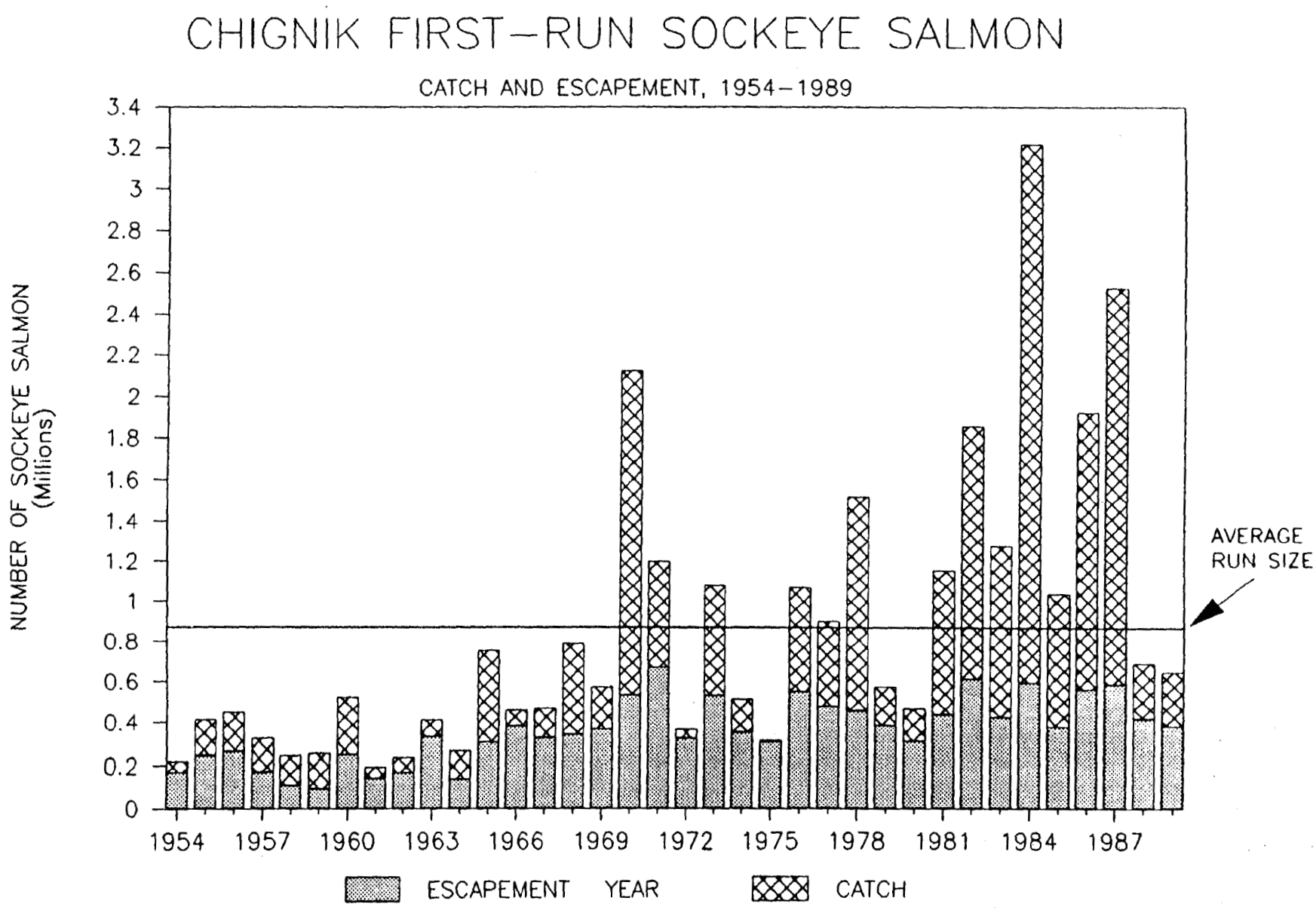

FIGURE 8. FIRST-RUN SOCKEYE SALMON CATCH AND ESCAPEMENT, 1954-89.

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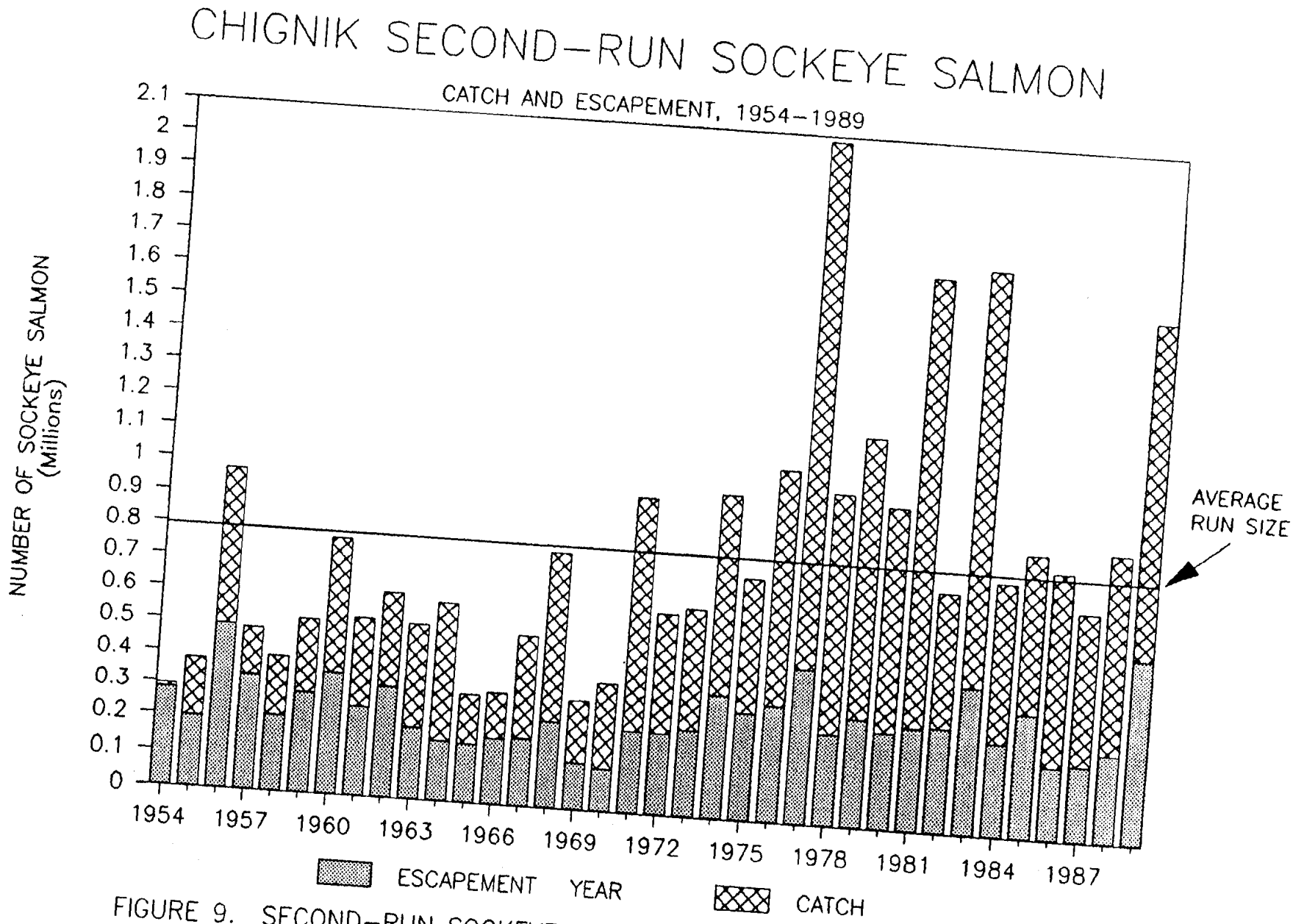

FIGURE 9. SECOND-RUN SOCKEYE SALMON CATCH AND ESCAPEMENT, 1954-89.

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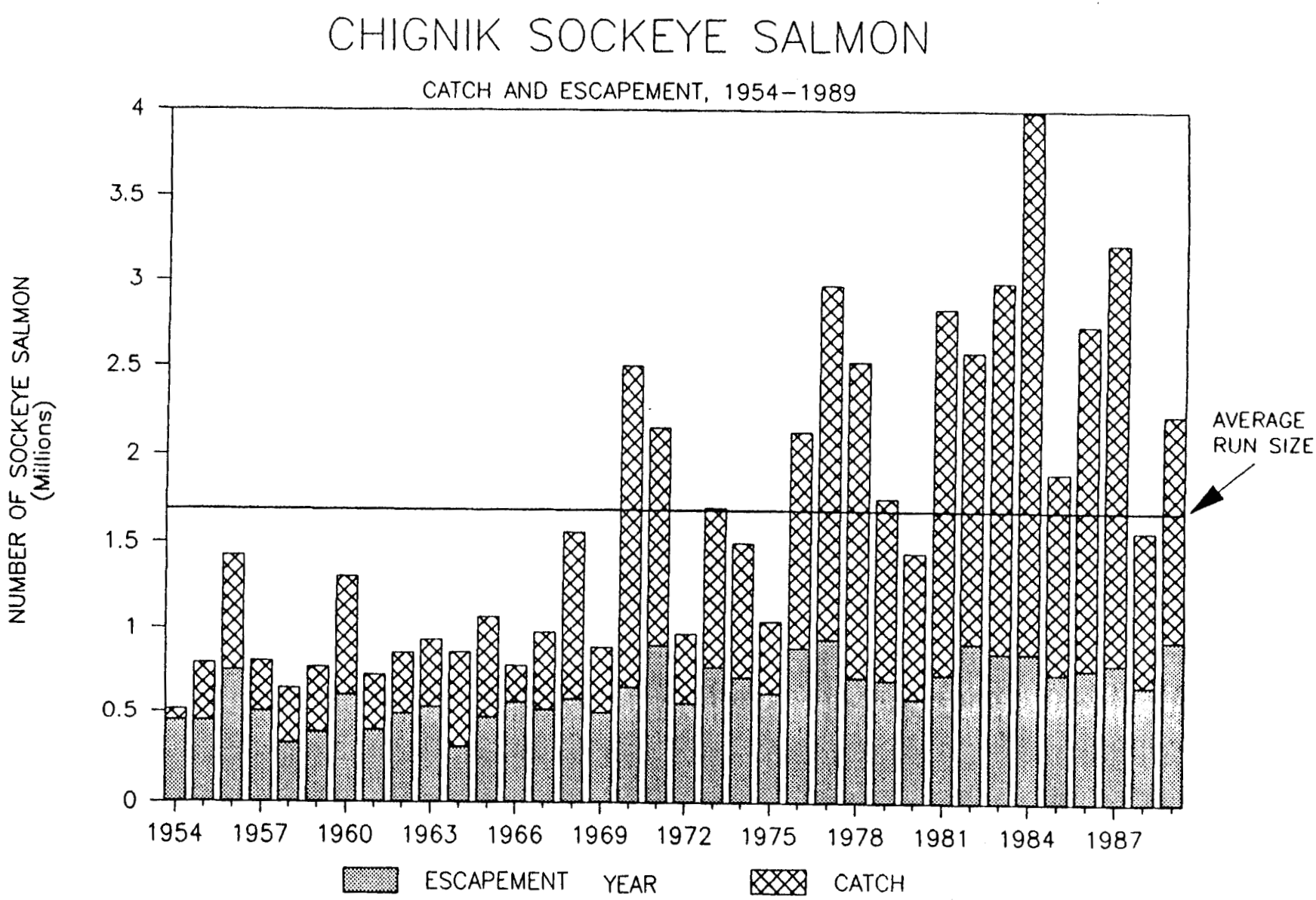

FIGURE 10. CHIGNIK MANAGEMENT AREA SOCKEYE SALMON CATCH & ESCAPEMENT, 1954–89.

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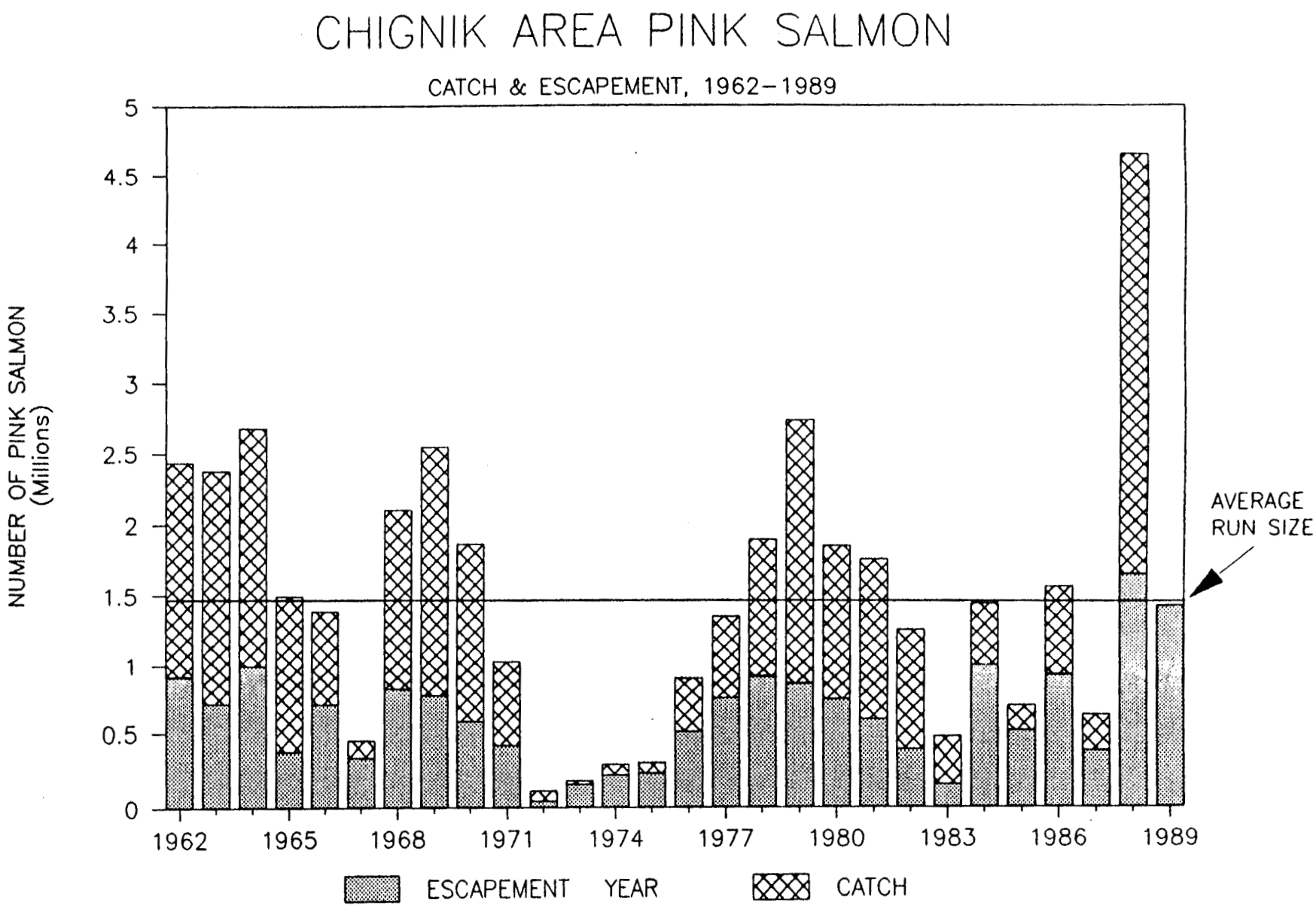

FIGURE 11. CHIGNIK MANAGEMENT AREA PINK SALMON CATCH AND ESCAPEMENT, 1962-89.

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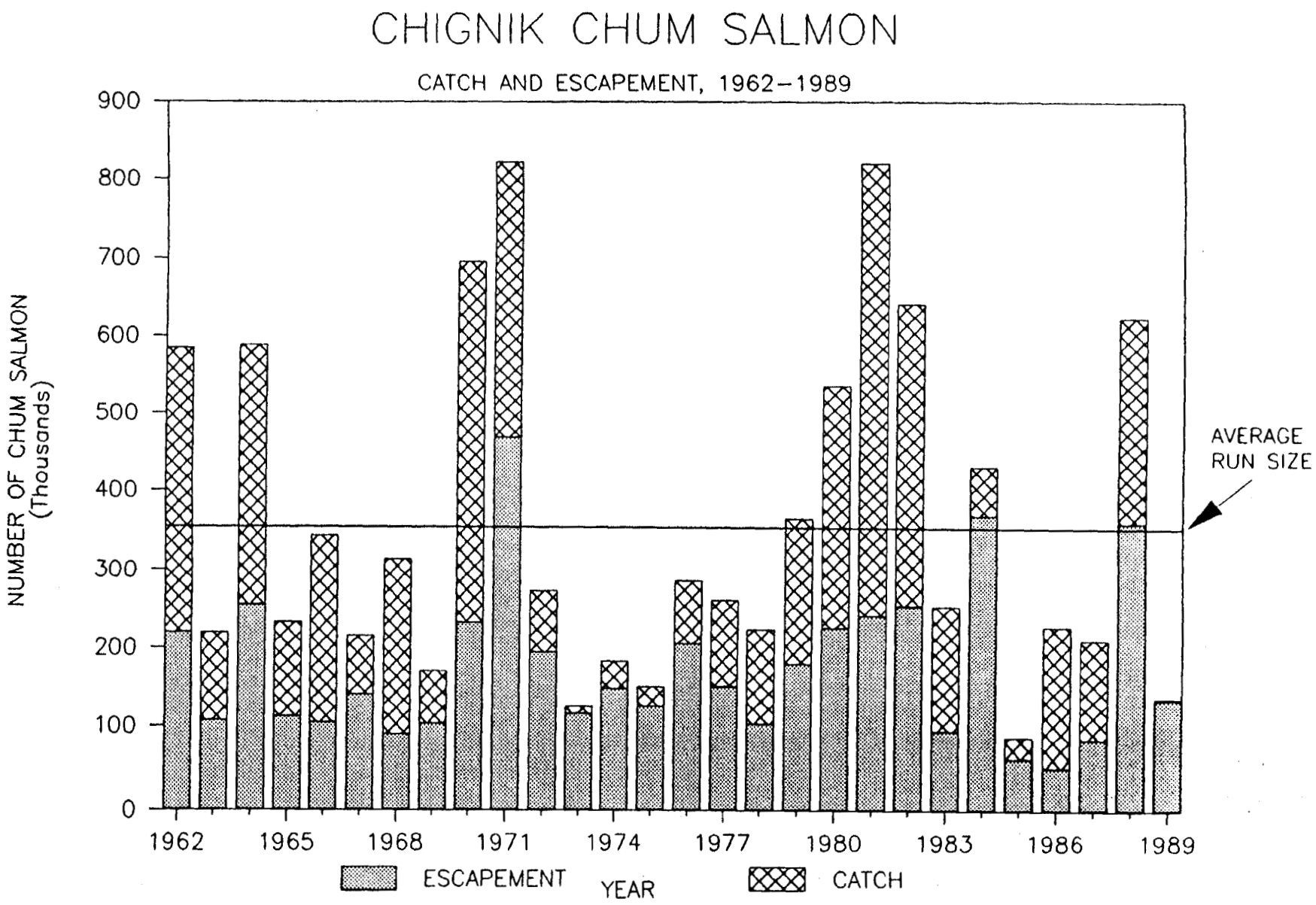

FIGURE 12. CHIGNIK MANAGEMENT AREA CHUM SALMON CATCH AND ESCAPEMENT, 1962-89.

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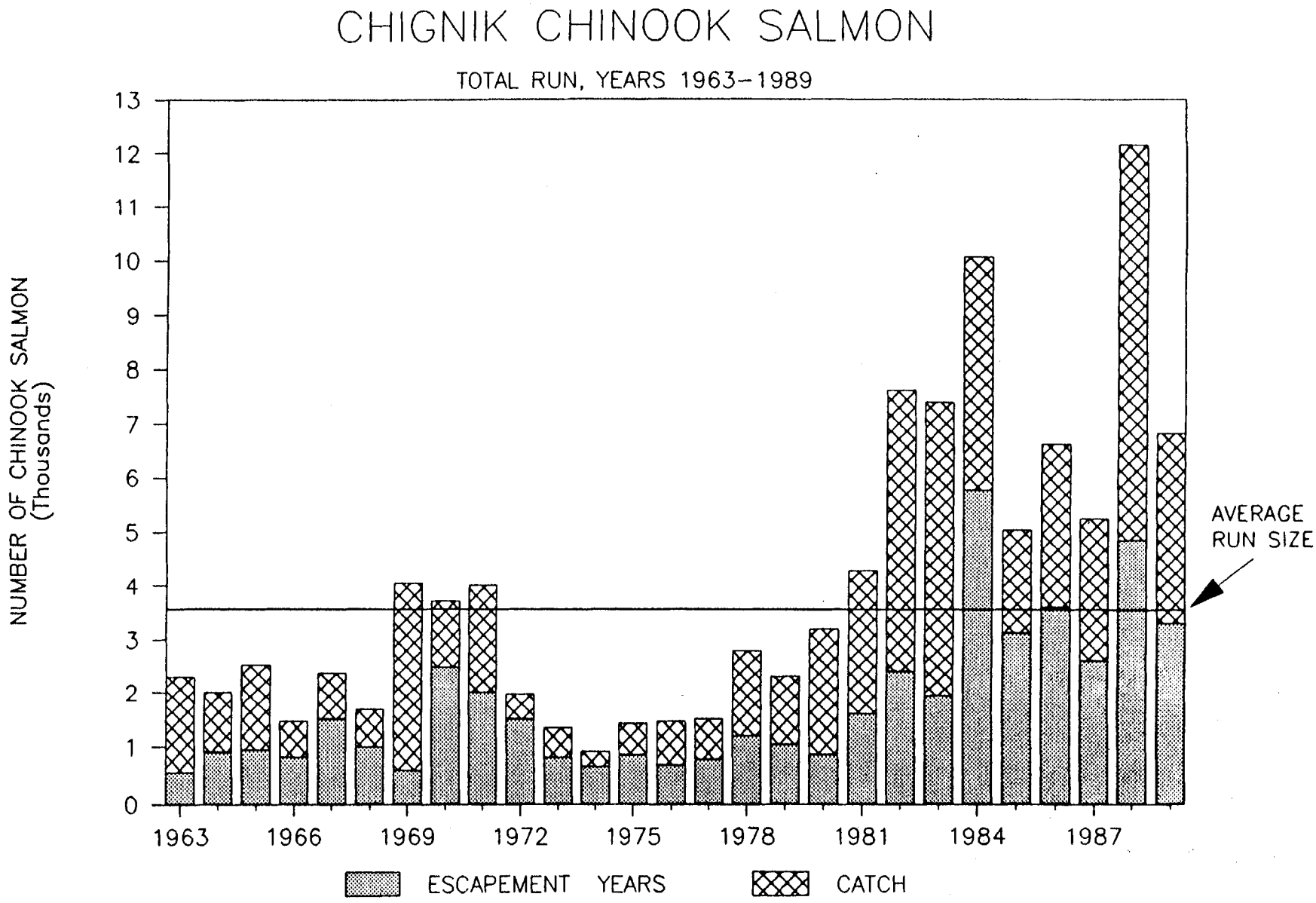

FIGURE 13. CHIGNIK MANAGEMENT AREA CHINOOK SALMON CATCH & ESCAPEMENT, 1963-89.

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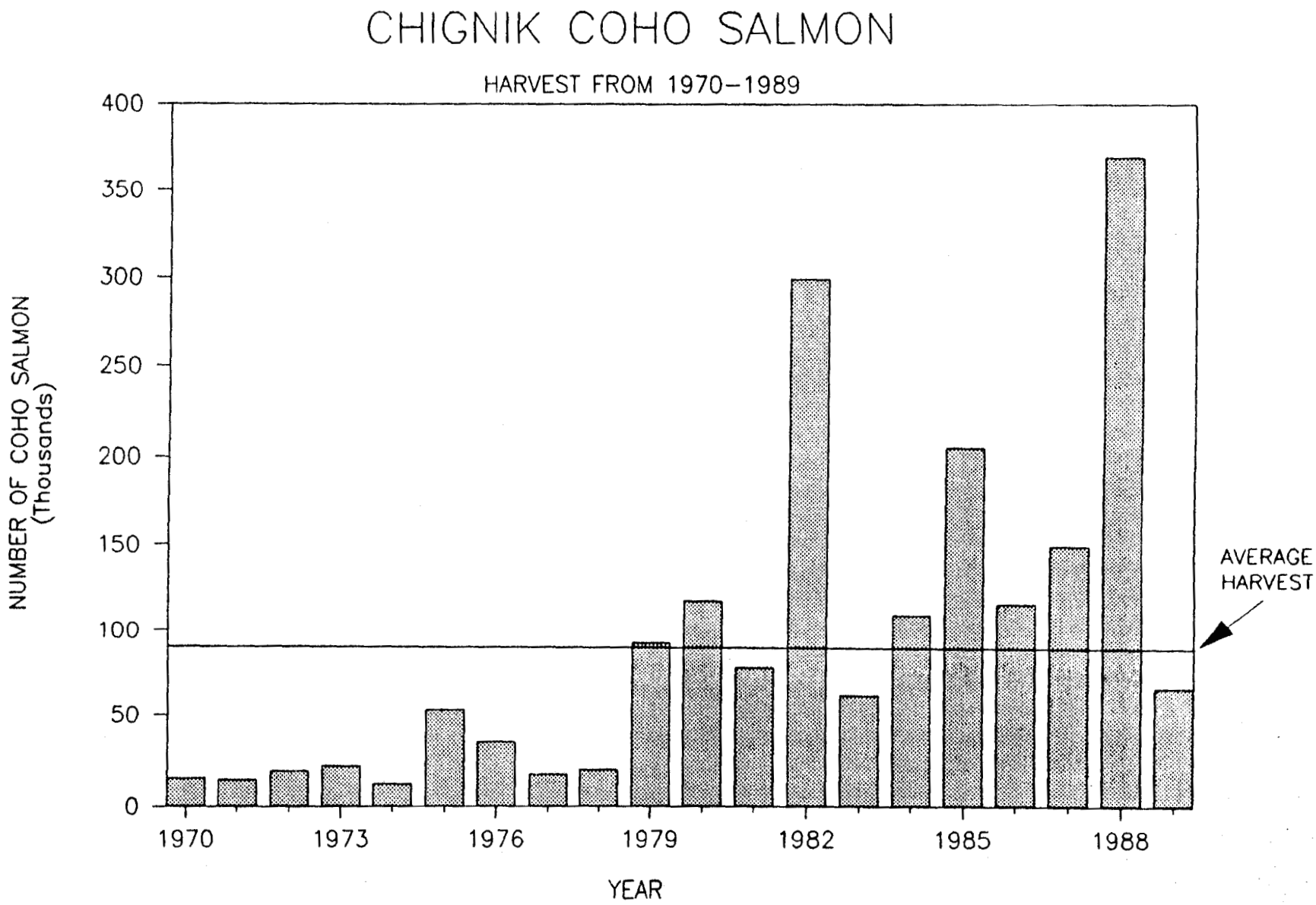

FIGURE 14. CHIGNIK MANAGEMENT AREA COHO SALMON CATCH 1970–1989.

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COHO CATCHES BY STAT WEEK FOR 1988

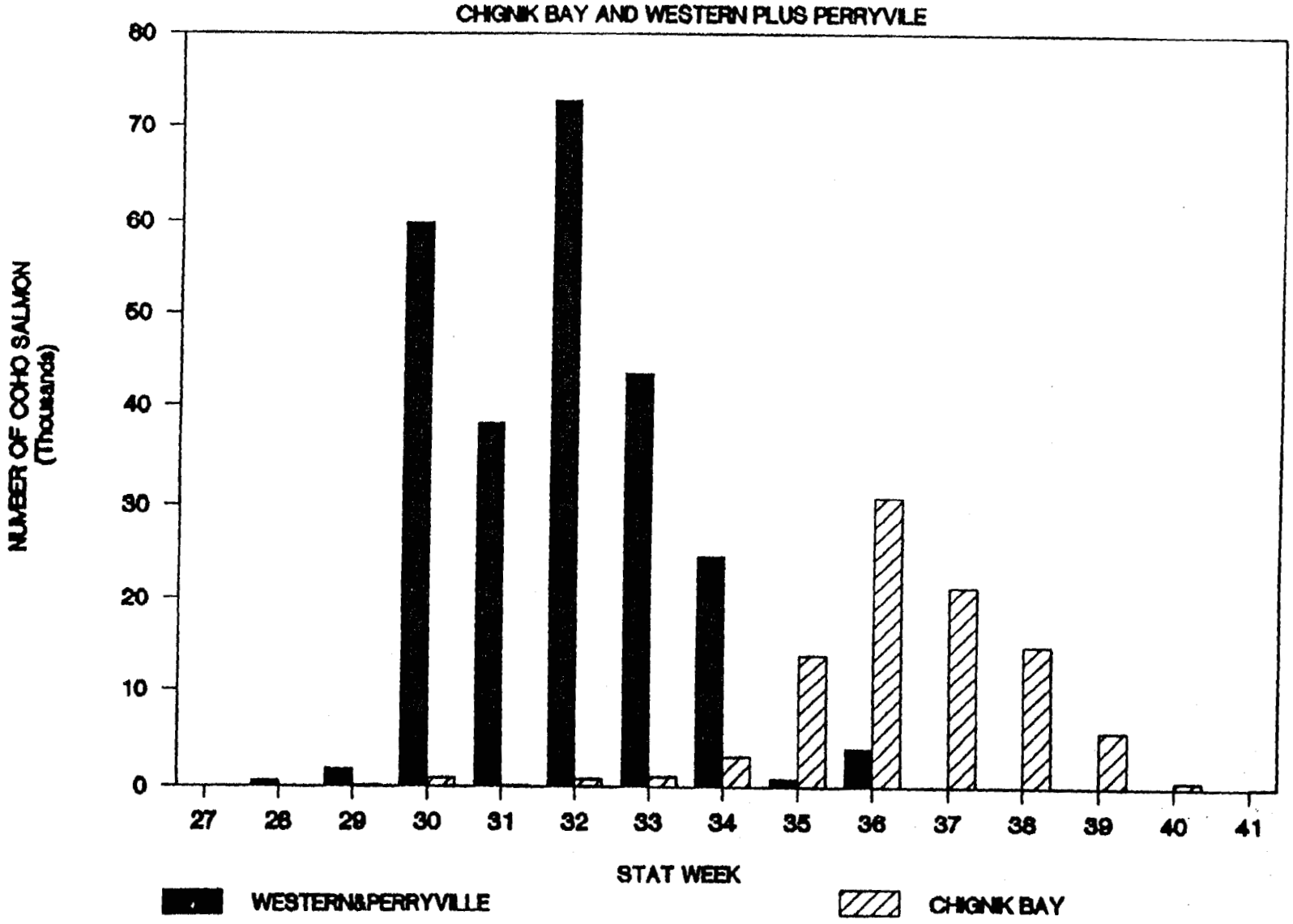

Figure 15. Coho salmon harvest, by 1988 stat week, for Western plus Perryville Districts and Chignik Bay District.

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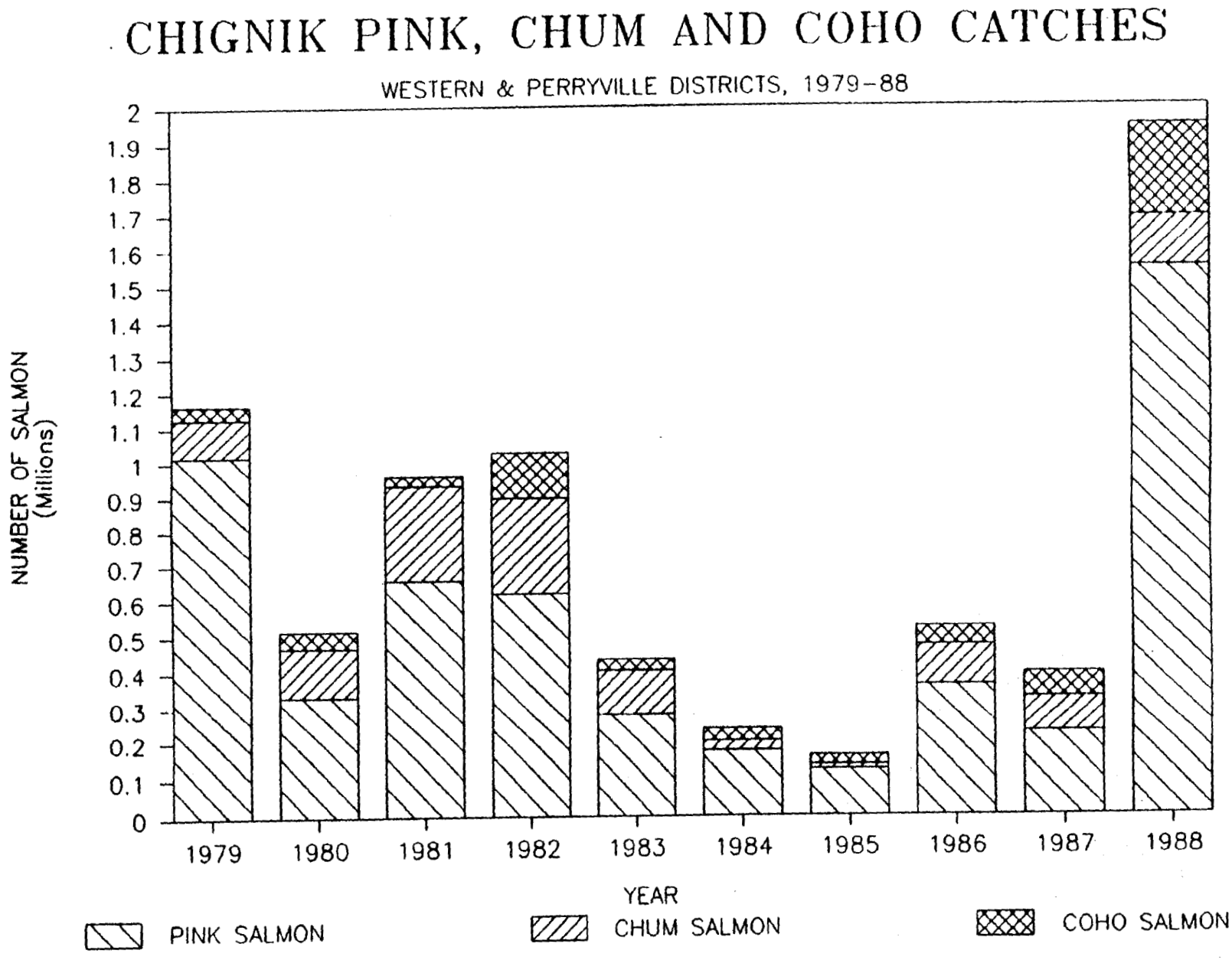

Figure 16. Pink, chum and coho salmon catches in the Western and Perryville Districts, 1979-88.

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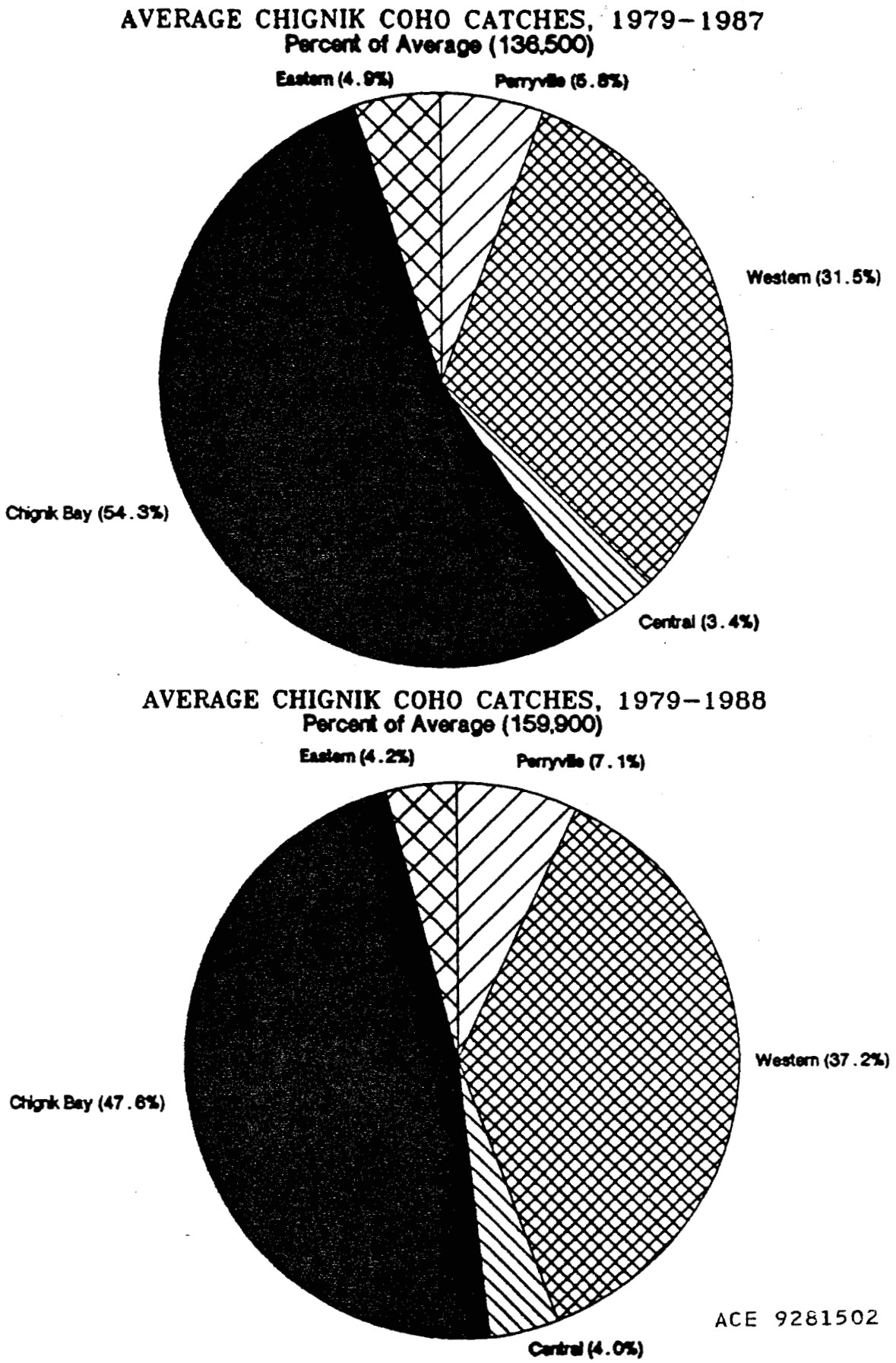

Figure 17. Average percent harvest of coho salmon in the Chignik Area, by district, from 1979-87 and 1979-88.

EFFORT IN NUMBER OF LANDINGS, 1979–1988

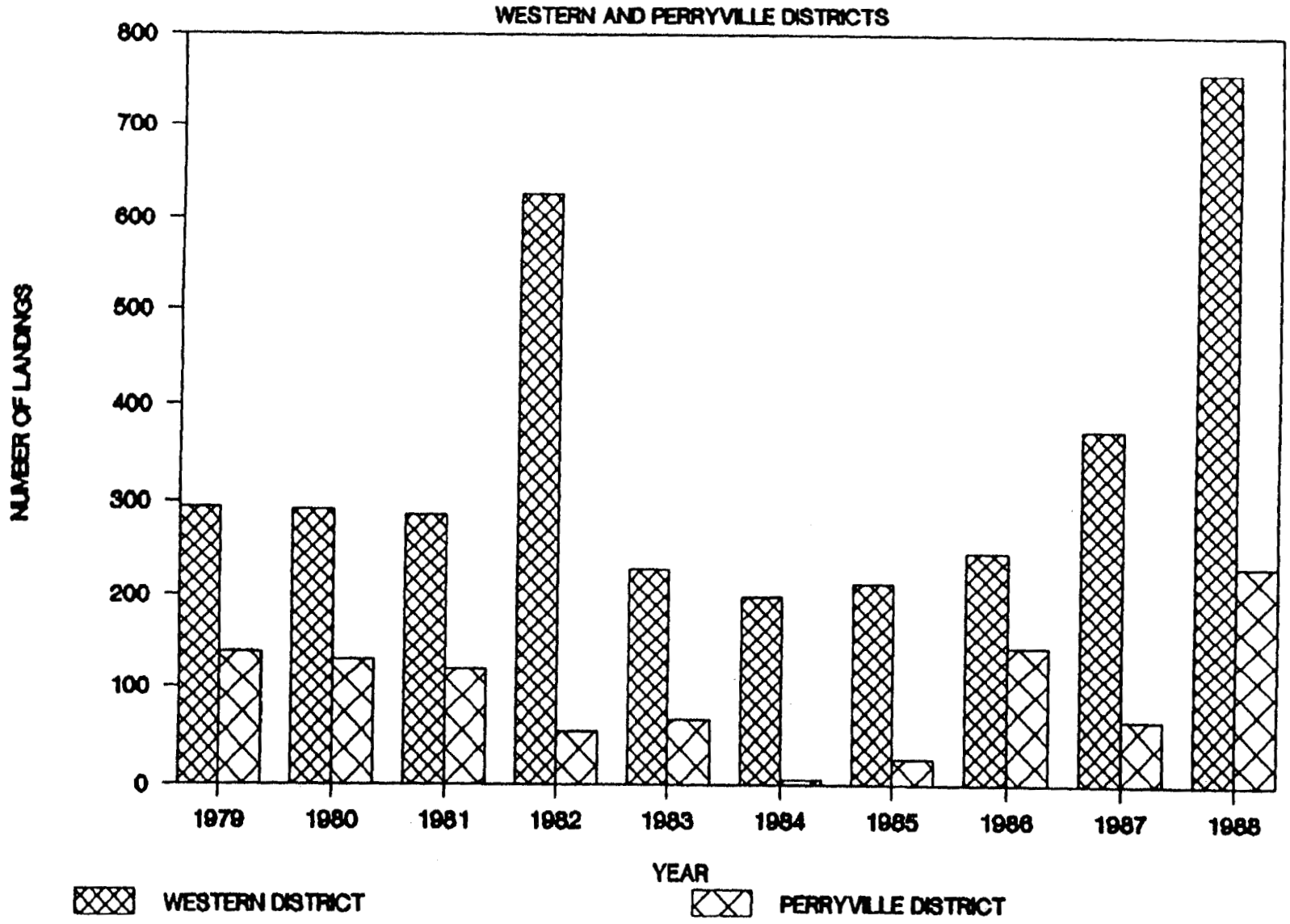

Figure 18. Effort, in number of landings, in the Western and Perryville Districts from 1979 to 1988.

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CHIGNIK COHO SALMON CATCHES, 1979–1988

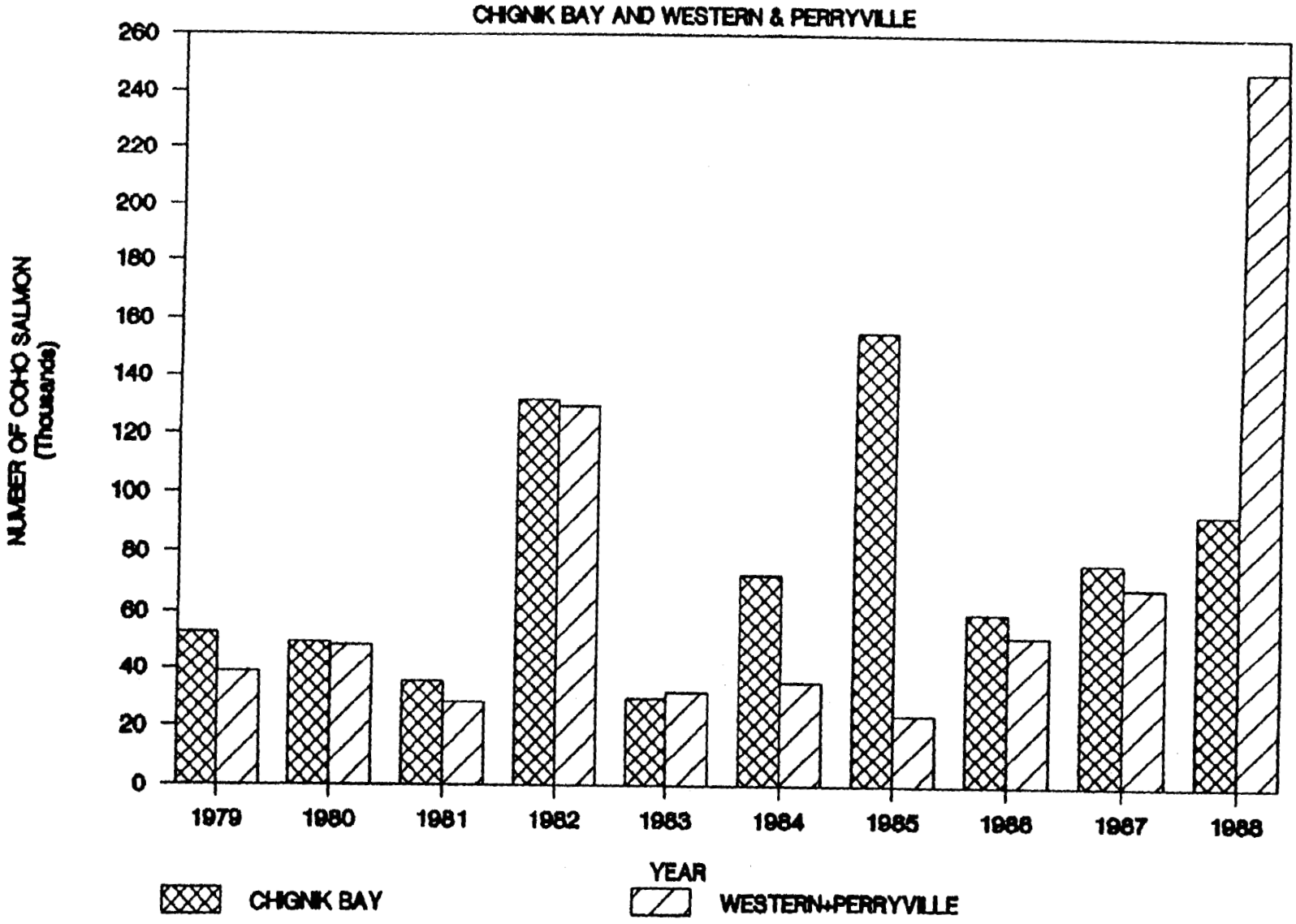

Figure 19. Coho salmon catches in the Western plus Perryville Districts in the Chignik Bay District from 1979 to 1988.

Table 1. Chignik Management Area salmon catches[1] 1970-1989.

YEAR	CHINOOK	SOCKEYE	COHO	PINK	CHUM	TOTAL
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
1989	3,542	1,156,877	66,641	27,712	1,620	1,256,392
Avg (1980-1988)	3,885	1,553,341	168,131	888,315	233,660	2,847,332
1989 Forecast Point Estimate	3,000	1,150,000	100,000	448,000	120,000	1,821,000

/1 Catch does not include Cape Igvak or Balboa-Stepovak catches.

ACE 9281505

Table 2. Chignik River System sockeye salmon escapement goals for Black Lake (early) and Chignik Lake (late runs), by time period.

The numbers of fish presented in the escapement tables below were derived from averages over several years of escapements of various timing and magnitude. It should be noted that daily escapement levels will fluctuate considerably throughout the run. THE TABLES LISTED SERVE ONLY AS A GUIDE FOR ACHIEVING THE TOTAL ESCAPEMENT FOR EACH RUN. In-season variations from the figures listed may be due to variations in actual run timing and/or strength of the run.

EARLY RUN - 400,000 ESCAPEMENT

June 12	40,000
June 14	50 - 65,000
June 16	75 - 100,000
June 18	125 - 150,000
June 20	175 - 200,000
June 22	225 - 250,000
June 25	275 - 325,000
June 30	350 - 400,000

LATE RUN - 250,000 ESCAPEMENT

	EARLY ESCAPEMENT IS ACHIEVED	EARLY ESCAPEMENT IS NOT ACHIEVED
July 6	-	40,000
July 8	-	45 - 50,000
July 10	40,000	55 - 65,000
July 12	50 - 60,000	70 - 75,000
July 14	65 - 75,000	75 - 80,000
July 16	80 - 90,000	80 - 90,000
July 19	100 - 115,000	100 - 115,000
July 21	125 - 135,000	125 - 135,000
July 23	145 - 160,000	150 - 160,000
July 26	170 - 180,000	170 - 180,000
July 29	185 - 195,000	190 - 195,000
July 31	195 - 200,000	195 - 200,000

ACE 9281506

Table 3. CHIGNIK SOCKEYE RUN CATCHES[1] 1964 - 1989 (Numbers of Fish in Thousands)

	Chignik Area		Cape Igvak		Balboa-Stepovak[8]		
	Catch	%	Catch	%	Catch	%	Total Catch
1964[2]	561	90.63	15	2.42	43	6.95	619
1965[2]	635	90.46	11	1.57	56	7.98	702
1966[2]	225	88.24	18	7.06	12	4.71	255
1967[2]	473	91.67	23	4.46	20	3.88	516
1968[2]	878	80.92	136	12.53	71	6.54	1,085
1969[2]	310	74.70	98	23.61	7	1.69	415
1970[2]	1,426	70.04	542	26.62	68	3.34	2,036
1971[2]	1,016	76.97	253	19.17	51	3.86	1,320
1972[2]	379	86.33	42	9.57	18	4.10	439

1964-72 catch and percentage figures are total for the entire season. Catch figures and percentages after 1972 are only through July 25.

1973[3]	768	89.41	53	6.17	38	4.42	859
1974[3]	517	73.12	122	17.26	68	9.62	707
1975[3]	115	81.56	24	17.02	2	1.42	141
1976[3]	760	82.25	118	12.77	46	4.98	924
1977[3]	1,543	90.39	129	7.56	35	2.05	1,707
1978[4/5]	1,452	85.36	227	13.35	22	1.29	1,701
1979[4/6]	799	91.11	15	1.71	63	7.18	877
1980[4/6]	662	91.31	1	0.14	62	8.55	725
1981[4/6]	1,605	79.97	284	14.15	118	5.88	2,007
1982[4/6]	1,251	83.90	172	11.54	68	4.56	1,491
1983[4/6]	1,451	73.06	318	16.01	217	10.93	1,986
1984[4/6]	2,476	74.47	464	13.95	385	11.58	3,325
1985[4/7]	692	79.72	125	14.40	51	5.88	868
1986[4/7]	1,456	82.63	188	10.67	118	6.70	1,762
1987[4/7]	1,660	78.01	322	15.08	147	6.91	2,128
1988[4/7]	675	95.74	11	1.56	19	2.70	705
1989[4/7]	496	99.40	0	0	3	0.60	499

Footnotes are listed on following page.

ACE 9281507

Table 3. (Continued) CHIGNIK SOCKEYE RUN CATCH FOOTNOTES

1/The Cape Igvak and Balboa-Stepovak figures represent 80% of the total sockeye catches for those areas as it is estimated that roughly 80% of the sockeye caught in the Cape Igvak section and Balboa-Stepovak are destined for Chignik.

2/Prior to 1973, Cape Igvak and Balboa-Stepovak fisheries were regulated by set weekly fishing periods in the regulation book, usually 5 days per week. The situation was sometimes modified due to poor escapements at Chignik.

3/During 1973 through 1977 all three fisheries were managed on a day for day basis.

4/Beginning with the 1978 season, the current Cape Igvak Fishery Management Plan still in effect today was implemented. The Cape Igvak fishery was allocated 15 percent of the total Chignik destined sockeye catch.

5/During 1978, seining prior to July 11 was disallowed in Beaver, Balboa, and Stepovak Bays. The set gillnet fishery was allowed to fish 3 days per week thorough July 10 after which the fishery was managed on the basis of local stocks.

6/During 1979-1984, 5 days per week were allowed at Balboa-Stepovak (including Beaver Bay) with a ceiling of 60,000 estimated Chignik destined sockeye, prior to July 11. If the Chignik Area sockeye catch was 1,000,000 or more before July 11, the 60,000 ceiling was to be dropped.

7/Beginning in 1985, Balboa-Stepovak was placed on an allocation of 6.2 percent of the total estimated Chignik sockeye catch through July 25. After July 25, Balboa-Stepovak is managed on a local stock basis. The allocation was changed to an even 6 percent beginning in 1988. Seining is still not allowed prior to July 11.

8/Balboa-Stepovak includes Beaver Bay. This fishery is also referred to as the Southeastern District Mainland fishery.

ACE 9281508-1L1HF

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