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Kotzebue District Fisheries Report, 1995

to the

Alaska Board of Fisheries

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1995 KOTZEBUE SOUND SALMON SEASON SUMMARY

General Information

The Commercial harvest in the Kotzebue District (Figure 1, Figure 2) during 1995 consisted of 290,730 chum salmon, 5 chinook salmon, and 2,090 Dolly Varden (Table 1). This commercial chum harvest was near the mid-range of the projected 250,000-350,000 salmon. This catch was just above the 16 year (1979-1994) average of 282,000. There were 92 permits that fished this year. This is the lowest number of participants in the fishery since 1971 (91). The low fishing effort is attributed to construction opportunities available in the region and the lowest salmon prices since 1967 ($0.11/lb).

Gear is limited to set nets with an aggregate of no more than 150 fathoms per fisherman. Fishermen generally operate with one end on or near shore and with all three shackles connected. Fishermen also set in deeper channels in the mud flats further out from shore. Most gear used in the district is 5-7/8 in (14.9 cm) or 6 in (15.2 cm) stretch multifillament gill net.

From July 10 to July 17 the season began normally with bi-weekly 24 hour fishing periods. After period 3, the hours were reduced at the buyers request. Because of a poor chum salmon market, processors held the buyers to a limited poundage for each commercial period. For the remainder of the season, openings were coordinated with buyers so that fish in excess of their limitations would not be taken and the harvest could be shipped for processing in a timely manner. This procedure kept salmon at a high quality which enabled processors to market Kotzebue chum salmon. Both processors indicated that they were working with a thin margin of profit and a delivery of poor quality fish could end the commercial fishery. A total of thirty openings were fished in 1995 for a total of 232 hours. Since the fisheries inception in 1962, only 1993 (168) had fewer hours fished. This was about half of the recent 16 year (1979-1994) average (433). Commercial fishing period lengths varied from 2 hours to 24 hours in length during the 1995 season.

Two buyers purchased a total of 2,329,898 pounds of chum salmon (average weight 8.0) at $.13 per pound, 93 pounds of chinook salmon (average weight 18.6) at an average of $1.00 per pound, and 13,195 pounds of Dolly Varden (average weight 6.3) at an average of $.20 per pound. The total ex-vessel value was $316,031 to Kotzebue area fishermen with an average of $3,435 for each participating permit holder (Table 2). Both buyers ice packed their fish and flew them out in the round for processing.

Inseason Management

Primary fishery management objectives were to provide adequate chum salmon escapement through the commercial fishery: (1) to ensure sustained runs by allowing adequate natural escapement, and (2) to meet subsistence harvest needs. Fishery management depended on comparing period and cumulative season catch rates to that of previous years. A comparison of catch rates over the history of the fishery has shown a close relationship to the total run strength.

Because of a lack of experienced sonar project leaders, the Noatak River sonar was not in operation in 1995. Noatak River sonar escapement counts had been used in past seasons during the management of the final third of the season. Managers relied on comparisons of historic and inseason catches and catch rates to judge the strength of the chum return.

Age composition of catches were also closely monitored to determine the strength of age classes in the return. Older salmon tend to migrate into freshwater first; a fact that affects catch rate as the season progresses and affects the fishery managers evaluation of the catch statistics. Weak 3 and 4 year old age classes will tend to depress mid-season catches (Table 6).

A preseason meeting was held with fishermen to discuss inseason management. A processor representative was also present. Both the processor and the department warned fishermen of the poor market conditions for chum salmon. Fishermen were told that periods would be shorter but could be more frequent as long as escapements were being achieved. This would ensure a marketable quality that would allow the fishery to continue. The processors representative warned that a single period of poor quality fish could end the fishery in Kotzebue because processors were working with narrow profit margins. As a result of the strong runs and the continued weak market conditions which governed the management of the fishery, no other meetings were held by the department to explain inseason fisheries management.

Contact with the Kobuk River subsistence fishermen was maintained during the season. 0 A test fishery occurred for the second year on the Kobuk River, however, test fish indices were not used for management purposes because of the lack of historical data. Information from the Kobuk River test fishery will be available in report form on a later date. A Noatak River test fish project was also operated and those results will also be available in a separate report at a later time.

Commercial Season Summary

The Kotzebue Sound commercial salmon season was opened July 10 by emergency order as established by regulation. The first three periods are 24 hours in length to assess the early portion of the run

as there are no other early indicators of run strength. Commercial catch for the first 3 periods nearly mirrored the recent 16 year average while catch per unit effort (CPUE) was 3-4 times the average (Table 3, Figure 3). Catch and catch rates for the first 3 periods indicated the chum salmon run to be above average in strength. With this information, processors were concerned the harvest might exceed what they could market and requested a reduction in period length.

The next two periods (4 and 5) were 12 hours in length. Even with shorter than normal hours and few fishermen, catch was above normal and catch rates were still several times greater than the historical average. This high harvest rate prompted processors to limit their buyers to purchase a limited poundage. The purchasing cap changed throughout the season based on the current processing capacity, ice, tote and airlift availability. Buyers were in contact daily with the department. The number of hours to be fished was negotiated between the two buyers by the department and announced to fishermen via KOTZ Radio and citizens band radio by 11:00 a.m. The fishing periods usually began in the early evening.

As the coho salmon run picked up in other areas of state, one buyer left the fishery leaving only one buyer to purchase Kotzebue chum salmon. This also coincided with the peak of the chum salmon run during the first week of August. The remaining buyer, fearful of quantities more than he or his processor could market, decided to develop a plan to control the quantity of salmon to be purchased if his processors market became limited. An announcement was made by the buyer that if the market dropped off, he would only buy from 10 fishermen. This way he could essentially control the quantity harvested. To be fair to his fishermen and to "non-loyal" fishermen, he would pick 5 of his fishermen and draw names of 5 more active fishermen. The buyer held a meeting on August 5 when the drawing took place. This limitation of fishermen was then a possibility at anytime and could be announced prior to any commercial opening. The processor continued to find viable markets and the fishery was never limited to the 10 fishermen but fishing time remained an essential tool in limiting the harvest.

The remaining buyer contacted the department concerning the possibility of using an average weight for all chum salmon to be purchased. Because of the quantities of salmon being delivered and the high rate of turn-over in the dock crew, he wanted to count the number of fish and use an average weight so that each individual fish did not have to be weighed. According to Alaska Statute 16.10.270 (a), averaging the individual salmon can be done if the "primary fish buyer and the seller agree in writing upon a sample weighing technique that will fairly determine the average weight of the fish purchased". Fishermen agreed to this and the buyer began using the season average weight of 8 pounds for each fish sold on August 8. He continued purchasing fish in this manner for the remainder of the season. As the salmon diminished, hours were increased. The last 5 openings (26-30) were all 12 hours in length and were announced the afternoon prior to the openings.

Age-5 salmon tend to dominate the earlier commercial openings with the younger age classes moving through during the middle and latter part of the fishery. This was also true for 1995. A higher than average number of age-5 fish were found compared to historical averages. Age-3 salmon were in normal abundance during the first half of the season but declined to roughly half of average in the latter portion of the season. This may be the result of a recent trend of fish being older at the time of maturity. This has been the trend throughout the region in the last several years (Table 5, Figure 4).

For the second year, there was no Fish and Wildlife Protection Officer in Kotzebue. Work load prevented the Nome protection officer from patrolling the fishery. Reports of fishing after the closure began as early as the third week of the fishery and continued until the end of the season when fishing late seemed more of the norm than pulling out on time. With the buyer restricted to a limited poundage, excess catches due to fishermen fishing late could have easily exceeded the holding capacity of the buyer and ended the commercial fishery. As a preventative measure, the buyer began giving fishermen a limited time frame to deliver fish at the end of each period.

Sikusuilaq Hatchery

The total predicted return of hatchery salmon was 82,000. The estimated commercial harvest from the hatchery was 57,000 chum salmon. All but two periods after August 15 were thought to have had harvests composed of between 20% - 35% hatchery stocks. Because of the poor market conditions, there was no interest in harvesting the excess salmon at the hatchery.

The 1995 spring release of fry may be the last from Sikusuilaq Hatchery as the state has ceased operations due to budget cuts. Currently the state is in the process of turning over the hatchery to the Northwest Arctic Borough. At the time of this report, there are no known plans to re-open the hatchery.

Escapement

A test fishing project located in Kiana monitored salmon run strength and timing into the Kobuk River. The test fish crews in Kiana also visited with subsistence fishermen to monitor subsistence catches. Even though a sonar project did not operate this year on the Noatak River, a reduced crew continued test fishing to monitor escapements into the Noatak River.

The test fish index from the Kobuk River was similar to last year's strong run, though the project did not operate as long (Table 7, Figure 5). Even with the clear water conditions, catch rates did not seem to be significantly affected. Most likely, catch rates would

have been higher if water had been more turbid. However, affects of clear water net avoidance were significantly buffered because of the tannic stained water of the Kobuk River. The last two years has proven the Kobuk River test fish project is feasible in extreme high and dirty water years like 1994, or low and clear water years like 1995.

As mentioned previously, only the test fishing portion of the Noatak River sonar project operated this year. A two person crew operated a test fish project, identical to the test fishery used for species apportionment when the sonar is in operation. This methodology maintained a continuation of the apportionment data base while monitoring escapement into the Noatak. This year's data was compared to the previous two years (1993 & 1994) test fish data from the right bank. The results was that the 1995 cumulative CPUE was the lowest of the three years (Table 8, Figure 6). This is attributed to net avoidance due to extremely clear water. Only a few days of high catch rates occurred and those were during periods of higher turbidity. This year's poor performance is identical to 1991 when the test net project indicated a poor chum salmon run while aerial surveys indicated escapements were met. If management in 1991 and 1995 were dependent on test fishing, the commercial fishery would have been severely restricted, even though escapements were average to well above average as indicated by catch rates and the aerial survey index. Both 1991 and 1995 demonstrate that test net catches are not an indices of salmon escapement into the Noatak River.

This year's aerial survey conditions were some of the best in recent history. Of the ten scheduled surveys, nine were flown and were considered fair or better. One survey was not flown due to the lack of a survey pilot, rather than poor weather. Aerial escapement goals on all tributaries, with the exception of the Squirrel River, were roughly doubled (Figure 7). The Squirrel River escapement goal was essentially met. Run timing, by aerial survey, was normal with two exceptions, the Salmon River and the Upper Kobuk area. These two index areas indicated an earlier than normal run. The department missed a tremendous opportunity to compare aerial survey counts to sonar counts on the Noatak River. The surveys of only two other years (1976 and 1982) in the last twenty-five equaled or exceeded this years aerial survey flights.

Dolly Varden

During previous years, the incidental catch of Dolly Varden (locally called trout) was virtually non-existent because of closed periods or shorter openings late in the season. This year, commercial fishing occurred during what is normally the time period when the Dolly Varden migrate through the district. The incidental harvest was higher than normal at 2,090. Spawners and wintering Dolly Varden normally migrate through the district during the third week of August. The Dolly Varden were larger and more numerous this season, making them vulnerable to commercial gear. The lowest prices in

nearly 30 years for chum salmon caused fishermen to operate near town and not fish where the bulk of the trout migration occurs (Table 4).

Freshwater Fisheries

Limited commercial harvest of miscellaneous finfish has been allowed since statehood, normally under the auspices of a permit which delineates harvest levels, open areas, legal gear, etc. There was no reported commercial harvest of whitefish, pike, or burbot during the 1995 commercial salmon season. Sheefish are caught and sold predominantly between mid-November and late March. Only one fishermen reported sales of sheefish in the 1994-95 season, 161 fish with a weight of 1,840 pounds (Table 9).

1996 Outlook

The outlook for the 1996 season is based on the returning age classes of the 1994 season. During the 1996 season, the four year old age component of the run is expected to be near average, while the five year old component is expected to be above average. The three year old component is generally small, and it too is likely to be near average. The commercial harvest is expected to fall within the range from 250,000 to 350,000 chum salmon, assuming an adequate market.

Table 1. Commercial catches of chum salmon, chinook salmon, and Dolly Varden by period in the Kotzebue District, 1995.

Period	Date	Hours Fished	Number of Fishermen	Chum [a]			Chinook			Dolly Varden		
				Number	Pounds	Avg. Wt.	Number	Pounds	Avg. Wt.	Number	Pounds	Avg. Wt.
1	July 10–11	24	9	2,483	20,075	8.1	1	31	31.0	1	4	4.0
2	July 13–14	24	19	8,834	70,089	7.9						
3	July 17–18	24	34	17,239	138,259	8.0						
4	July 19–20	12	36	10,329	82,703	8.0				5	26	5.2
5	July 20–21	12	42	11,193	91,394	8.2	1	21	21.0	4	26	6.5
6	July 21–22	4	13	3,002	23,844	7.9						
7	July 24	4	30	7,625	59,945	7.9						
8	July 25	6	33	12,017	96,214	8.0						
9	July 26	3	29	7,827	62,158	7.9						
10	July 28	4	44	18,281	147,103	8.0				5	43	8.6
11	July 31	3	48	11,207	89,901	8.0				34	25	0.7
12	August 1	3	47	7,967	65,609	8.2						
13	August 2	2	41	10,313	83,350	8.1						
14	August 4	2	37	6,322	50,212	7.9						
15	August 7	2	41	10,970	87,469	8.0						
16	August 8	3	44	12,972	103,779	8.0 [b]						
17	August 9	3	40	11,290	90,320	8.0 [b]						
18	August 10	3	48	13,723	109,784	8.0 [b]				3	45	15.0
19	August 11	3	37	13,083	104,664	8.0 [b]						
20	August 14	2	19	3,212	25,696	8.0 [b]				10	70	7.0
21	August 15	4	29	5,726	45,768	8.0 [b]	1	6	6.0	183	1,078	5.9
22	August 16	6	36	11,824	94,592	8.0 [b]				238	1,483	6.2
23	August 17	8	39	19,223	153,784	8.0 [b]				259	1,469	5.7
24	August 18	4	23	4,899	39,192	8.0 [b]				157	931	5.9
25	August 21	7	33	6,775	54,235	8.0 [b]				298	1,954	6.6
26	August 22	12	37	8,676	69,488	8.0 [b]				304	1,993	6.6
27	August 23	12	27	8,366	66,928	8.0 [b]				191	1,290	6.8
28	August 24	12	28	9,717	78,216	8.0 [b]				241	1,701	7.1
29	August 25	12	28	8,226	65,808	8.0 [b]				101	631	6.2
30	August 28	12	22	7,409	59,319	8.0 [b]	2	35	17.5	56	426	7.6
Totals		232	92	290,730	2,329,898	8.0	5	93	18.6	2,090	13,195	6.3

[a] Does not include 125 chum salmon at 1,005 pounds from test fish sales.

[b] Commercial fishermen and the lone buyer have agreed to average the weight of the fish so each individual catch does not need to be weighed. The average weight is based on the previous commercial catches, an average of 8.0 pounds.

Table 2. Kotzebue District chum salmon fishery information, 1981–1995.

Commercial Catch	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Chum (in thousands)	677.2	417.8	175.8	320.2	521.4	261.4	109.5	352.9	254.6	163.3	239.9	289.2	71.1	149.5	290.7
Number of permits	187	199	189	181	189	187	160	193	165	153	143	149	114	109	92
Average catch per permit	3,621	2,099	930	1,769	2,759	1,398	684	1,828	1,543	1,067	1,678	1,941	623	1,371	3,160
Est. value (x 1,000)	$3,247	$1,962	$421	$1,149	$2,137	$933	$515	$2,605	$614	$438	$429	$527	$231	$234	$316
Est. value per fisherman (x 1,000)	$17.4	$9.9	$2.2	$6.3	$11.3	$5.0	$3.2	$13.5	$3.7	$2.9	$3.0	$3.5	$2.0	$2.1	$3.4
Escapement [a]															
Noatak	106,513	20,682 [c]	78,900	67,800	43,526 [c]	37,277 [c]	5,565 [c]	45,930 [c]	[b]	23,345 [c]	80,750	34,335 [c]	30,210 [c]	[b]	155,920
Upper Kobuk	8,648	14,674	33,746	10,621	6,200 [c]	6,015 [c]	8,210	11,895		14,935 [c]	24,645	10,935 [c]	11,334		32,361
Squirrel	9,854	7,690	6,075	5,473	6,145	4,982 [c]	2,708	4,848 [c]		5,500 [c]	4,606	2,765	4,463		10,605
Salmon	4,709	1,871 [d]	1,677	1,471	2,816	1,971 [c]	3,333	6,208		6,335 [c]	5,845	1,345	13,880		13,988
Tutuksuk	1,114	1,322	2,637	1,132	5,100	4,257	206 [c]	3,122		2,275 [c]	744	1,162	1,996		3,901
Total	130,838	46,239	123,035	86,497	63,787	54,502	20,022	72,003		52,390	116,590	50,542	61,883		216,775

Escapement Goals

Noatak River (mouth to Kelly Bar)	80,000
Upper Kobuk (Kobuk Village to Beaver Creek)	10,000
Squirrel River	11,500
Salmon River	7,000
Tutuksuk River	2,000
Total	110,500

[a] Peak aerial survey
[b] Aerial surveys not feasible due to unfavorable weather and water conditions.
[c] Poor aerial survey conditions.
[d] Foot surveys.

Table 3. Kotzebue Sound chum salmon 1995 commercial and 16 year average catch statistics (1979–1994). [a]

Average (1979–1994)						Cumulative		
Period	Hours	Number Permits	Catch (x 1,000)	CPUE	Prop. Catch	Catch (x 1,000)	CPUE	Prop. Catch
1	24	41	3.1	3.1	0.011	2.9	3.1	0.011
2	24	67	5.2	3.1	0.018	8.1	3.1	0.032
3	24	93	10.1	4.7	0.036	18.2	3.8	0.074
4	25	113	18.5	6.4	0.066	36.7	4.8	0.142
5	27	125	22.9	6.5	0.081	59.7	5.3	0.226
6	30	134	31.5	7.8	0.112	87.3	5.9	0.320
7	35	135	37.5	8.8	0.133	122.4	6.3	0.461
8	38	142	41.0	9.2	0.145	160.9	6.6	0.589
9	40	133	38.5	7.3	0.136	199.3	6.8	0.739
10	38	136	43.8	10.6	0.155	237.7	6.9	0.838
11	41	126	25.0	5.9	0.089	258.0	6.8	0.916
12	42	110	14.7	3.8	0.052	269.9	6.5	0.958
13	41	83	9.4	3.1	0.033	277.5	6.3	0.984
14	39	64	6.0	2.4	0.021	280.9	6.2	0.995
15	41	39	2.8	1.8	0.010	282.3	6.2	1.000

Year:	1995					Cumulative		
Period	Hours	Number Permits	Catch [a] (x 1,000)	CPUE	Prop. Catch	Catch (x 1,000)	CPUE	Prop. Catch
1	24	9	2.5	11.5	0.009	2.5	11.5	0.009
2	24	19	8.8	19.4	0.030	11.3	16.8	0.039
3	24	34	17.2	21.1	0.059	28.6	19.2	0.098
4	28	51	24.5	17.2	0.084	53.1	18.2	0.183
5	13	47	27.5	45.0	0.094	80.5	22.8	0.277
6	4	44	18.3	103.9	0.063	98.8	26.7	0.340
7	8	64	29.5	57.6	0.101	128.3	30.4	0.441
8	2	37	6.3	85.4	0.022	134.6	35.6	0.463
9	8	53	35.2	83.1	0.121	169.9	36.0	0.584
10	6	50	26.8	89.4	0.092	196.7	39.2	0.676
11	12	41	20.8	42.2	0.071	217.4	39.5	0.748
12	12	44	24.1	45.7	0.083	241.6	40.0	0.831
13	31	44	23.8	17.5	0.082	265.4	35.9	0.913
14	24	35	17.9	21.4	0.062	283.3	34.4	0.975
15	12	22	7.4	28.1	0.025	290.7	34.2	1.000

[a] Does not include 125 chum salmon sold from the Noatak R. test fish project.

Table 4. Kotzebue District commercial chum salmon, chinook salmon, and Dolly Varden catch by statistical area, 1995.

Statistical Area	Chum CPUE	Number of Fishermen	Chum [a]			Chinook			Dolly Varden		
			Number	Pounds	Avg. Wt.	Number	Pounds	Avg. Wt.	Number	Pounds	Avg. Wt.
331-01	12.1	83	232,615	1,862,703	8.01	4	72	18.00	1,543	9,667	6.27
331-02	4.1	17	16,346	131,074	8.02	1	21	21.00	365	2,332	6.39
331-03	1.9	11	4,854	38,970	8.03				13	57	4.38
331-04	5.1	11	12,927	103,257	7.99				76	560	7.37
331-05	1.9	4	1,806	14,653	8.11						
331-06	6.8	14	22,182	179,241	8.08				93	579	6.23
Totals	13.6	92	290,730	2,329,898	8.01	5	93	18.60	2,090	13,195	6.31

[a] Does not includes 125 chum salmon (1,005 lbs.) caught and sold from the Noatak R. test fish project.

Table 5. Historical average age composition by period for the recent 16 years (1979–1994) and 1995.

16 Year Avg.		Percent				Catch by Age			
Period	Catch	3	4	5	6	3	4	5	6
1	3,144	0.4	34.6	60.9	4.1	12	1,088	1,915	129
2	5,188	0.9	41.6	53.1	4.4	47	2,158	2,755	228
3	10,100	1.4	40.7	51.9	6.0	141	4,111	5,242	606
4	18,509	1.4	49.1	45.9	3.6	259	9,088	8,496	666
5	22,906	1.4	47.2	46.7	4.7	321	10,812	10,697	1,077
6	31,542	1.9	54.2	41.4	2.6	599	17,096	13,058	820
7	37,477	3.0	56.8	38.0	2.2	1,124	21,287	14,241	824
8	41,039	4.4	61.9	32.0	1.8	1,806	25,403	13,132	739
9	38,486	6.3	59.0	32.3	2.5	2,425	22,707	12,431	962
10	43,795	6.1	63.5	29.0	1.4	2,671	27,810	12,701	613
11	25,014	11.2	65.5	22.3	1.0	2,802	16,384	5,578	250
12	14,661	12.4	60.1	25.5	2.0	1,818	8,811	3,739	293
13	9,387	13.1	63.6	21.8	1.5	1,230	5,970	2,046	141
14	5,991	11.3	62.6	25.3	0.8	677	3,750	1,516	48
15	2,783	4.8	67.8	26.4	1.1	134	1,887	735	31

Kotzebue Sound commercial catch and age composition, 1995.

		Percent				Catch by Age			
Period	Catch	3	4	5	6	3	4	5	6
1	2,483	0.0	28.7	64.8	6.5	0	713	1,609	161
2	8,834	0.4	31.0	64.9	3.7	35	2,739	5,733	327
3	17,239	2.0	47.6	47.6	2.8	345	8,206	8,206	483
4	24,544	0.4	54.7	43.4	1.5	98	13,426	10,652	368
5	27,525	2.1	56.6	38.3	3.0	585	15,588	10,529	823
6	18,281	1.7	60.2	36.4	1.7	311	11,005	6,654	311
7	29,536	1.2	65.2	31.7	1.6	341	19,260	9,368	479
8	6,322	3.1	55.5	39.3	2.2	196	3,509	2,485	139
9	35,232	1.4	64.4	32.8	1.4	493	22,689	11,556	493
10	26,806	3.3	58.2	36.8	1.7	885	15,601	9,865	456
11	20,762	5.0	73.7	25.0	1.3	1,038	15,302	5,191	270
12	24,122	3.6	62.7	31.9	1.8	868	15,124	7,695	434
13	23,817	2.9	59.4	36.6	1.1	691	14,147	8,717	262
14	17,943	2.0	56.3	39.0	2.7	359	10,102	6,998	484
15	7,409	4.2	66.3	27.7	1.9	311	4,912	2,052	141

Table 6. Kotzebue District commercial age and sex compositon of chum salmon, 1962–1995.[a]

Year	Sample Size	Percent		Percent Age Class			
		Males	Females	Age–3	Age–4	Age–5	Age–6
1962	69	26.1	73.9	7.3	63.3	28.0	1.4
1963	255	35.0	65.0	30.1	50.9	18.6	0.4
1964	463	43.6	56.4	52.9	45.0	1.7	0.4
1965	480	42.1	57.9	2.3	91.0	6.7	0.0
1966	430	40.2	59.8	10.1	67.1	22.8	0.0
1967	1,865	37.3	62.7	8.8	72.2	18.5	0.5
1968	1,989	48.2	51.8	21.2	58.1	19.8	0.9
1969	1,125	53.7	46.3	36.8	58.3	4.9	0.0
1970	267	45.3	54.7	3.9	91.0	5.1	0.0
1971	1,105	54.6	45.4	7.1	66.8	26.1	0.0
1972	980	50.9	49.1	15.8	59.5	24.1	0.6
1973	598	46.0	54.0	16.7	69.5	13.8	0.0
1974	350	47.1	52.9	28.5	63.5	7.8	0.2
1975	340	46.4	53.6	2.5	86.8	10.7	0.0
1976	566	47.9	52.1	11.2	51.5	37.2	0.1
1977	446	49.3	50.7	6.7	73.0	18.6	1.7
1978	579	49.9	50.1	10.5	57.5	31.8	0.2
1979 [b]	658	53.3	46.7	30.6	53.2	15.2	1.0
1980 [c]	710	56.4	43.6	15.1	78.1	6.6	0.2
1981 [d]	1,167	52.4	47.6	2.4	67.1	30.5	0.0
1982	983	48.8	51.2	5.9	48.3	40.3	5.5
1983 [e]	1,979	43.4	56.6	5.8	57.7	34.2	2.3
1984 [f]	2,933	50.2	49.8	14.6	64.4	19.7	1.3
1985 [g]	3,293	47.8	52.2	0.4	83.7	15.5	0.4
1986 [h]	3,095	46.0	54.0	0.3	18.6	78.9	2.2
1987 [i]	1,987	52.0	48.0	15.0	43.0	31.0	11.0
1988 [j]	3,324	48.0	52.0	6.5	74.9	16.9	1.7
1989	3,336	49.3	50.7	0.7	77.9	20.4	1.0
1990 [k]	2,497	49.4	50.6	2.3	45.6	50.7	1.4
1991	3,292	46.4	53.6	2.9	60.4	35.8	0.9
1992 [l]	3,706	39.9	60.1	0.9	58.5	37.5	3.1
1993 [m]	3,707	50.9	49.1	2.9	26.4	66.5	4.2
1994 [n]	3,744	44.8	55.2	3.3	63.0	30.8	2.9
16 Year Average (1979–1994)		47.6	52.4	4.7	57.2	35.7	2.4
1995	4,621	50.9	49.1	2.3	59.8	36.0	1.9

[a] Commercial periods not sampled for years 1962 to 1978 are unknown.
[b] Commercial openings 1 and 10 not sampled due to period closure.
[c] Commercial openings 8, 13, and 15 not sampled due to period closure.
[d] Commercial openings 8, 10, 12, and 14 not sampled due to period closure.
[e] Commercial openings 11, 13, 14, and 15 not sampled due to period closure.
[f] Commercial openings 14 and 15 not sampled due to period closure.
[g] Commercial openings 1, 3, 5, 7, 9, 11, and 13 not sampled due to period closure.
[h] Commercial opening 15 not sampled due to period closure.
[i] Commercial openings 1, 2, 4, 6, 7, 8, 10, 11, 14, and 15 not sampled due to period closure.
[j] Includes 0.1 percent age–7 fish.
[k] Commercial openings 11 to 15 not sampled due to period closure.
[l] Commercial opening 12 not sampled due to period closure.
[m] Commercial openings 6, 8, 10, 11, 12, 13, 14, and 15 were closed periods. Closed periods were sampled for age and sex composition from commercial test nets and are included in the 1993 data.
[n] Commercial openings 14 and 15 were closed periods. Closed periods were sampled for age and sex composition from commercial test nets and are included in the 1994 data.

Table 7. Kobuk River drift test fish historical mean daily CPUE and cumulative CPUE. 1993–1995. [a]

	1993		1994		1995	
Date	Daily	Cum.	Daily	Cum.	Daily	Cum.
10–Jul						
11–Jul						
12–Jul	11.18	11.18				
13–Jul	14.22	25.40	0.00	0.00	0.93	0.93
14–Jul	20.57	45.97	2.68	2.68	2.80	3.73
15–Jul	35.08	81.05	2.58	5.26	2.77	6.50
16–Jul	13.19	94.24	11.35	16.61	[b]	6.50
17–Jul	17.27	111.51	[b]	16.61	0.00	6.50
18–Jul	[b]	111.51	7.16	23.77	1.81	8.31
19–Jul	10.71	122.22	12.40	36.17	9.89	18.20
20–Jul	2.76	124.98 +	3.65	39.82	16.30	34.50
21–Jul	3.20	128.18	7.30	47.12	38.54	73.04
22–Jul	5.52	133.70	3.56	50.68	21.18	94.22
23–Jul	27.15	160.85	16.49	67.17	50.58	144.80
24–Jul	9.06	169.91	[b]	67.17	28.46	173.26
25–Jul	[b]	169.91	14.38	81.55	40.16	213.42
26–Jul	15.22	185.13	47.65	129.20	35.15	248.57
27–Jul	8.06	193.19	40.66	169.86	63.94	312.51 +
28–Jul	16.36	209.55	57.83	227.69	62.49	375.00
29–Jul	0.93	210.48	33.62	261.31	46.11	421.11
30–Jul	0.92	211.40	69.21	330.52 +	57.86	478.97
31–Jul	12.58	223.98	[b]	330.52	29.89	508.86
01–Aug	[b]	223.98	82.16	412.68	72.91	581.77
02–Aug	6.74	230.72	65.12	477.80	48.71	630.48 *
03–Aug	54.49	285.21 *	71.79	549.59	48.40	678.88
04–Aug	44.23	329.44	108.98	658.57 *	53.00	731.88
05–Aug	89.30	418.74 +	59.74	718.31	49.95	781.83
06–Aug	18.60	437.34	102.56	820.87	[b]	781.83
07–Aug	20.52	457.86	[b]	820.87	46.39	828.22
08–Aug	[b]	457.86	62.75	883.62	44.02	872.24
09–Aug	1.84	459.70	96.86	980.48 +	68.22	940.46 +
10–Aug	12.63	472.33	45.83	1,026.31	56.33	996.79
11–Aug	18.11	490.44	57.02	1,083.33	37.95	1,034.74
12–Aug	3.74	494.18	90.54	1,173.87	63.92	1,098.66
13–Aug			11.36	1,185.23	[b]	1,098.66
14–Aug			[b]	1,185.23	29.35	1,128.01
15–Aug			5.13	1,190.36	25.26	1,153.27
16–Aug			16.23	1,206.59	35.04	1,188.31
17–Aug			0.00	1,206.59		
18–Aug			0.00	1,206.59		
19–Aug			3.12	1,209.71		
20–Aug			0.00	1,209.71		
21–Aug			[b]	1,209.71		
22–Aug			0.00	1,209.71		
23–Aug			0.00	1,209.71		
24–Aug			0.00	1,209.71		
25–Aug			0.91	1,210.62		
26–Aug			5.56	1,216.18		
27–Aug			1.86	1,218.04		
28–Aug			0.93	1,218.97		
29–Aug			0.00	1,218.97		
30–Aug			0.00	1,218.97		

[a] Quartiles are indicated by "+" and the mid–points are indicated by "*".
[b] Regular day off.

Table 8. Noatak River test fish mean daily and cumulative CPUE for the Right Bank, 1993–1995.

	1993		1994		1995	
Date	Daily	Cum.	Daily	Cum.	Daily	Cum.
17–Jul						
18–Jul	21.51	21.51				
19–Jul	149.06	170.57			0.00	0.00
20–Jul	0.00	170.57			98.18	98.18
21–Jul	10.70	181.26			[b]	98.18
22–Jul	0.00	181.26	10.90	10.90	0.00	98.18
23–Jul	0.00	181.26	129.49	140.38	211.76	309.94
24–Jul	30.14	211.40	146.85	287.23	224.68	534.62
25–Jul	0.00	211.40	13.95	301.18	20.87	555.49
26–Jul	0.00	211.40	69.97	371.15	93.91	649.40
27–Jul	34.95	246.35	21.47	392.62	40.85	690.25
28–Jul	115.71	362.06	197.71	590.34		690.25
29–Jul	0.00	362.06	530.30	1,120.63	[b]	707.39
30–Jul	21.45	383.51	136.45	1,257.09	17.14	789.09 *
31–Jul	173.82	557.33	319.26	1,576.35	81.70	894.97
01–Aug	63.86	621.19	420.33	1,996.68	105.88	945.12
02–Aug	141.39	762.58	155.86	2,152.55	50.15	945.12
03–Aug	157.72	920.30	221.54	2,374.08	[b]	994.53
04–Aug	213.41	1,133.71	115.53	2,489.61	49.41	1,025.17
05–Aug	72.65	1,206.36	460.01	2,949.63	30.64	1,168.15
06–Aug	293.10	1,499.46	693.97	3,643.60	142.98	1,251.63
07–Aug	175.17	1,674.63	342.28	3,985.87	83.48	1,371.63
08–Aug	98.43	1,773.06	992.13	4,978.01	120.00	1,541.63
09–Aug	239.43	2,012.49	843.96	5,821.96	170.00	1,541.63
10–Aug	373.33	2,385.82	105.55	5,927.51	[b]	1,711.63
11–Aug	317.81	2,703.63	387.18	6,314.69	170.00	2,066.41
12–Aug	479.00	3,182.63 *	465.02	6,779.71 *	354.78	2,066.41 +
13–Aug	261.64	3,444.27	236.55	7,016.26	[b]	2,066.41
14–Aug	318.77	3,763.04	533.61	7,549.87	[b]	2,301.30
15–Aug	102.61	3,865.65	1,491.01	9,040.87	234.89	2,405.65
16–Aug	90.42	3,956.07	3,215.87	12,256.75	104.35	2,599.69
17–Aug	351.96	4,308.03	1,478.92	13,735.66 +	194.04	2,855.01
18–Aug	135.64	4,443.67	727.80	14,463.46	255.32	3,021.97
19–Aug	238.84	4,682.51	392.22	14,855.68	166.96	3,136.75 *
20–Aug	312.88	4,995.39	678.26	15,533.94	114.78	3,261.97
21–Aug	481.28	5,476.67	182.66	15,716.60	125.22	3,421.97
22–Aug	616.15	6,092.82	369.23	16,085.84	160.00	3,528.64
23–Aug	383.23	6,476.06 +	5,533.33	21,619.17 *	106.67	3,600.13
24–Aug	402.93	6,878.99	1,650.43	23,269.60	71.49	3,681.83
25–Aug	257.65	7,136.64	1,038.96	24,308.56	81.70	3,900.96
26–Aug	668.29	7,804.93	277.90	24,586.46	219.13	3,984.44
27–Aug	170.64	7,975.57	231.07	24,817.53	83.48	4,078.35
28–Aug	557.09	8,532.66	126.13	24,943.66	93.91	4,195.90
29–Aug	578.31	9,110.97	194.33	25,137.99	117.55	4,195.90
30–Aug	122.01	9,232.98	241.28	25,379.27		
31–Aug	209.75	9,442.73 *	122.26	25,501.53		
01–Sep	696.37	10,139.10	201.40	25,702.92		
02–Sep	514.29	10,653.39	63.58	25,766.50		
03–Sep	288.91	10,942.30	138.02	25,904.52		
04–Sep	220.07	11,162.37	59.97	25,964.49		
05–Sep	165.86	11,328.24	39.85	26,004.34		
06–Sep	0.00	11,328.24	0.00	26,004.34		
07–Sep	86.80	11,415.04	342.86	26,347.19		
08–Sep	171.43	11,586.46	0.00	26,347.19		
09–Sep	246.50	11,832.96	57.55	26,404.75		
10–Sep	79.21	11,912.17				
11–Sep	62.58	11,974.75				
12–Sep	186.05	12,160.80				
13–Sep	258.06	12,418.86				

[a] The quartiles are indicated by an "+" and the mid–points are indicated by an "*".
[b] No fishing due to day off, weather or mechanical.

Table 9. Kotzebue District winter commercial Sheefish harvest statistics, 1967–1995. [a]

Year [b]	No. of Fishermen	No. of Fish	Pounds		Price/ Pound	Estimated Value
			Total	Average		
1967 [c]		4,000	26,000	6.5	$0.20	$5,200
1968	10	792	4,752	6.0	$0.22	$1,045
1969	17	2,340	15,209	6.5	$0.25	$3,802
1970 [c]		2,206			$0.14	
1971	4	73	720	9.9	$0.13	$95
1972	5	456	4,071	8.9	$0.16	$651
1973	11	2,322	15,604	6.7	$0.20	$3,121
1974	6	1,080 [d]	6,265	5.8	$0.30	$1,880
1975	[c]	2,543 [d]	24,161	9.5	$0.30	$7,248
1976	14	2,633	19,484	7.4	$0.30	$5,845
1977	2	566	5,004	8.8	$0.30	$1,501
1978	11	2,879	26,200	9.1	$0.40	$10,480
1979 [e]						
1980	4	1,175	8,225	7.0	$0.50	$4,113
1981	1	278	1,836	6.6	$0.75	$1,377
1982	11	2,629 [f]	17,376	6.6	$0.75	$13,032
1983	8	1,424	13,395	9.4	$0.50	$6,698
1984	5	927 [d]	10,403	11.2	$0.55	$5,722
1985	4	342 [d]	3,902	11.4	$0.51	$1,990
1986	2	26	312	12.0	$0.75	$234
1987	3	670	5,414	8.1	$0.49	$2,653
1988	3	943	7,373	7.8	$0.45	$3,318
1989	8	2,335	16,749	7.2	$0.51	$8,542
1990 [c]	6	687	5,617	8.2		
1991	5	852	8,224	9.7	$0.50	$4,112
1992	3	289	2,850	9.9	$0.65	$1,853
1993	1	210 [d]	1,700	8.1	$0.50	$850
1994 [e]						
1995	1	161	1,840	11.4	$0.50	$920

[a] Data is not exact, in some instances total catch poundage was determined from average weight and catch data. Similarly, various price/pound figures were determined from price/fish and average weight data.

[b] Season was from October 1 to September 30. Year indicated would be the year the commercial season ended. For example, the year 1980 would represent October 1, 1979 to September 30, 1980.

[c] Data unavailable or incomplete.

[d] Number of fish not always reported. Estimates were based on average weight from reported sales which documented the number of fish.

[e] No reported commercial catches.

[f] Estimate based on historical average weight.

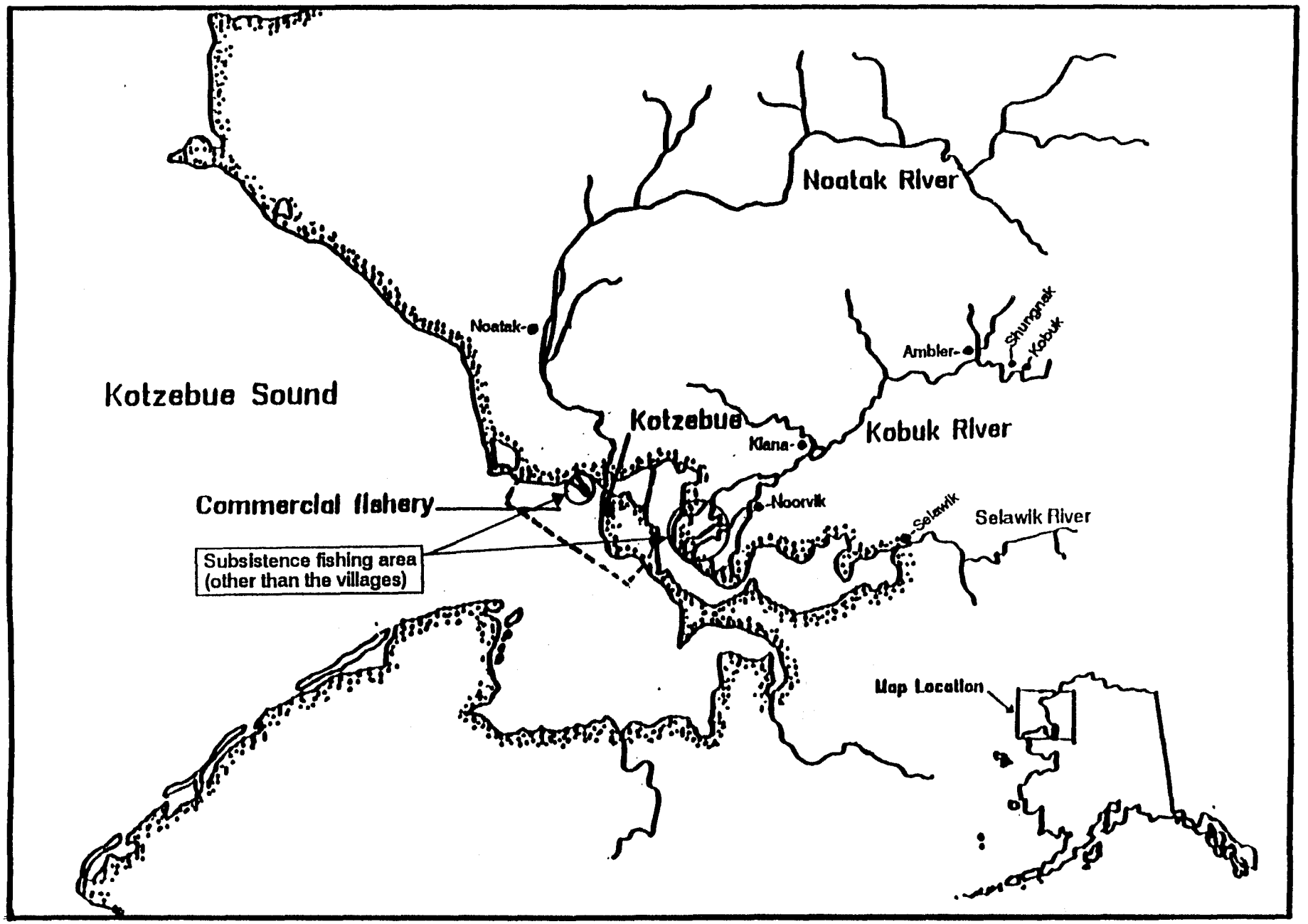


Figure 1. Kotzebue Sound commercial fishing district, villages and subsistence fishing areas, and mqjor chum salmon spawning tributaries.

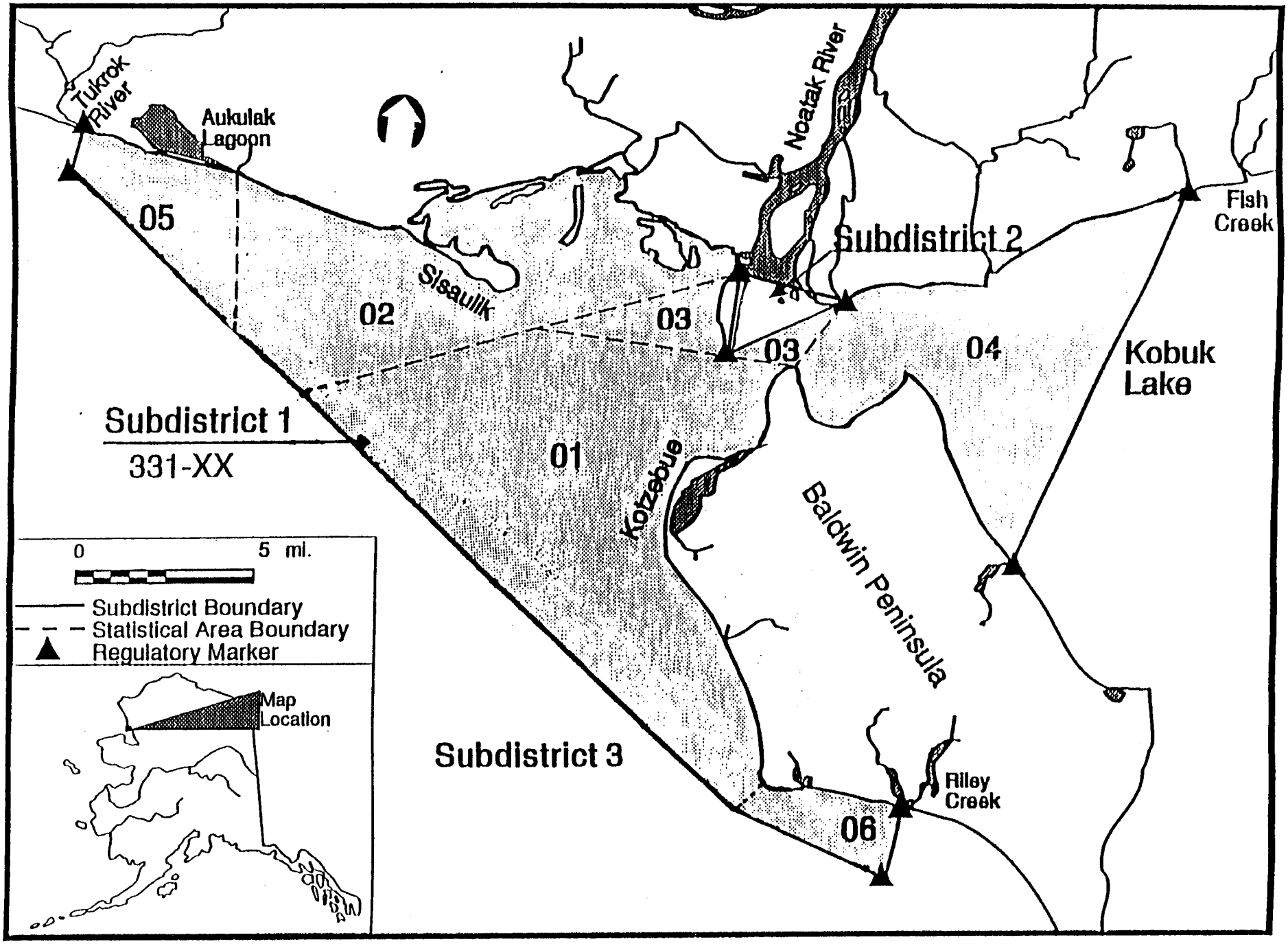
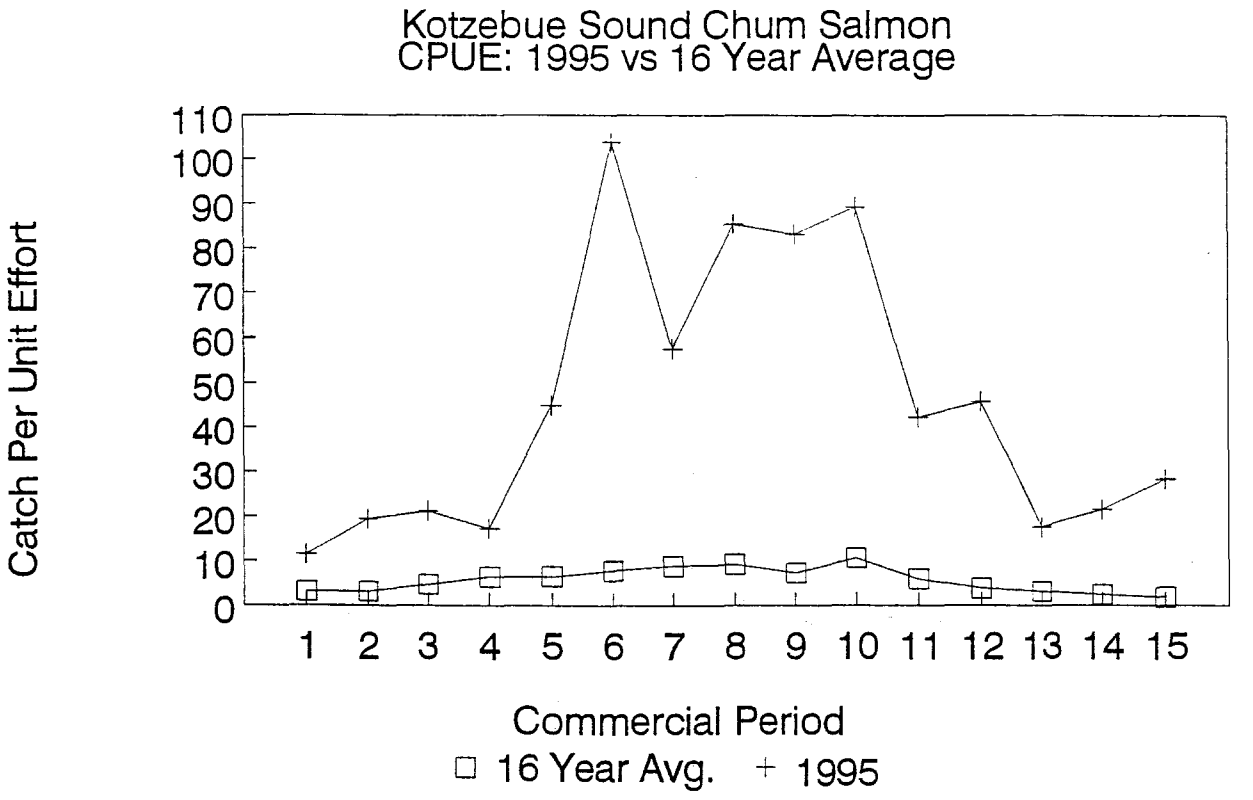


Figure 2. Kotzebue Sound commercial fishing subdistricts and statistical areas.



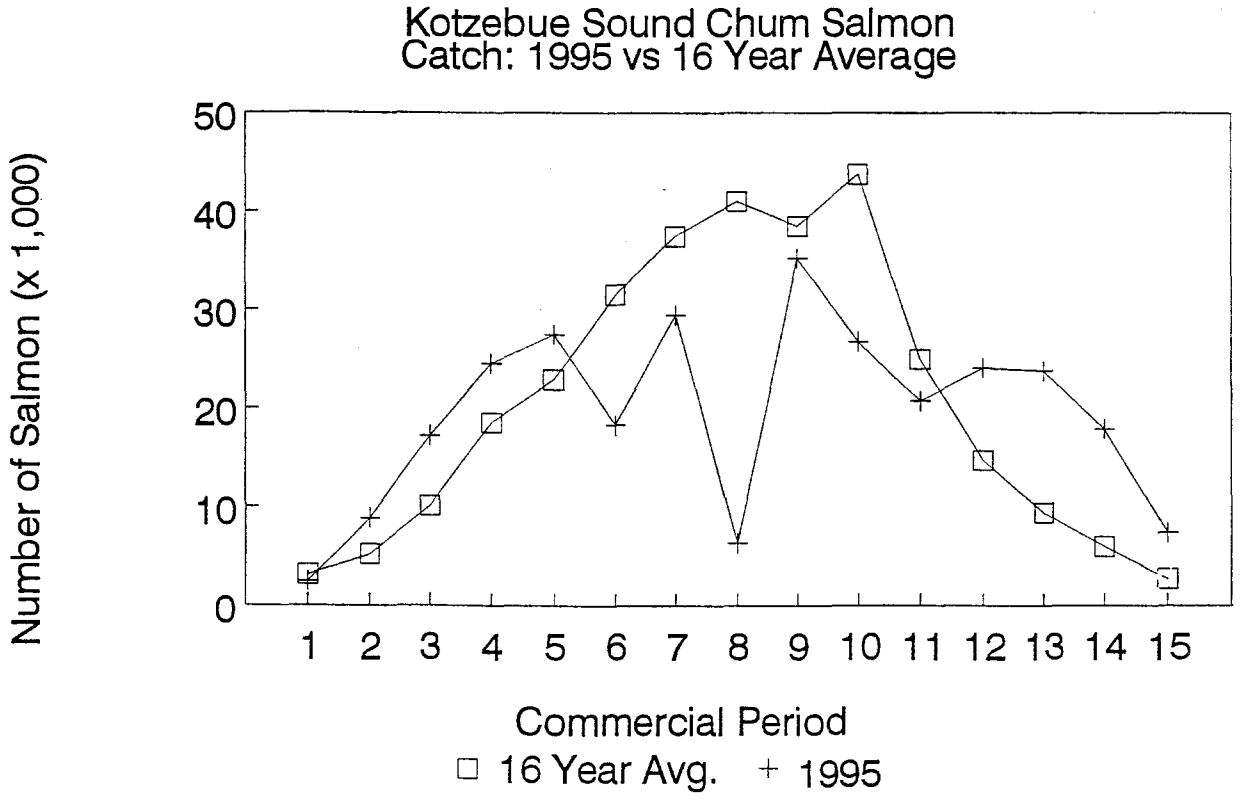


Figure 3. Kotzebue District previous 16 year average (1979–1994) and 1995 catch and catch per unit effort comparisons.

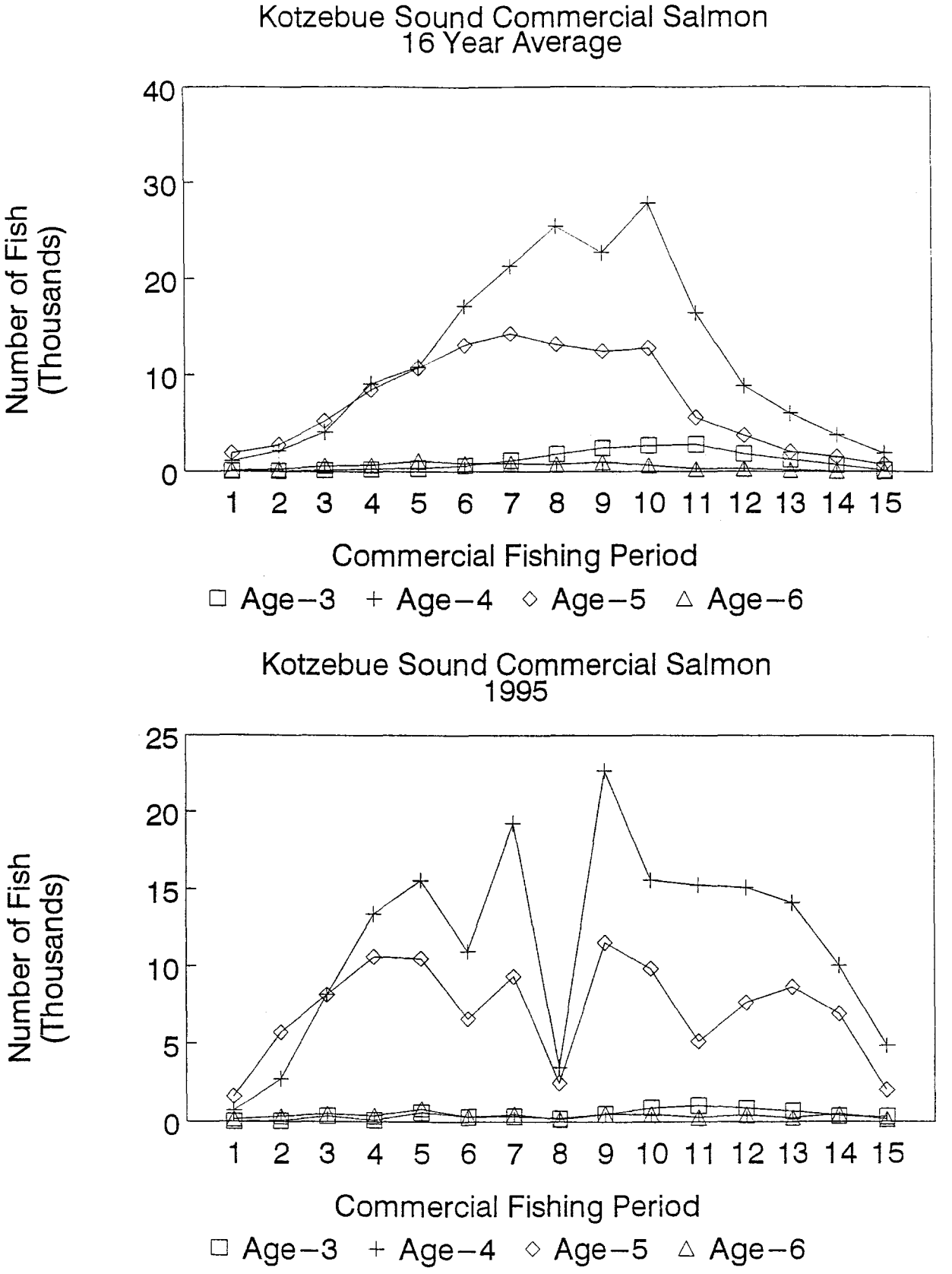


Figure 4. Age in numbers of chum salmon by period comparing recent 16 year average (1979–1994) to 1995.

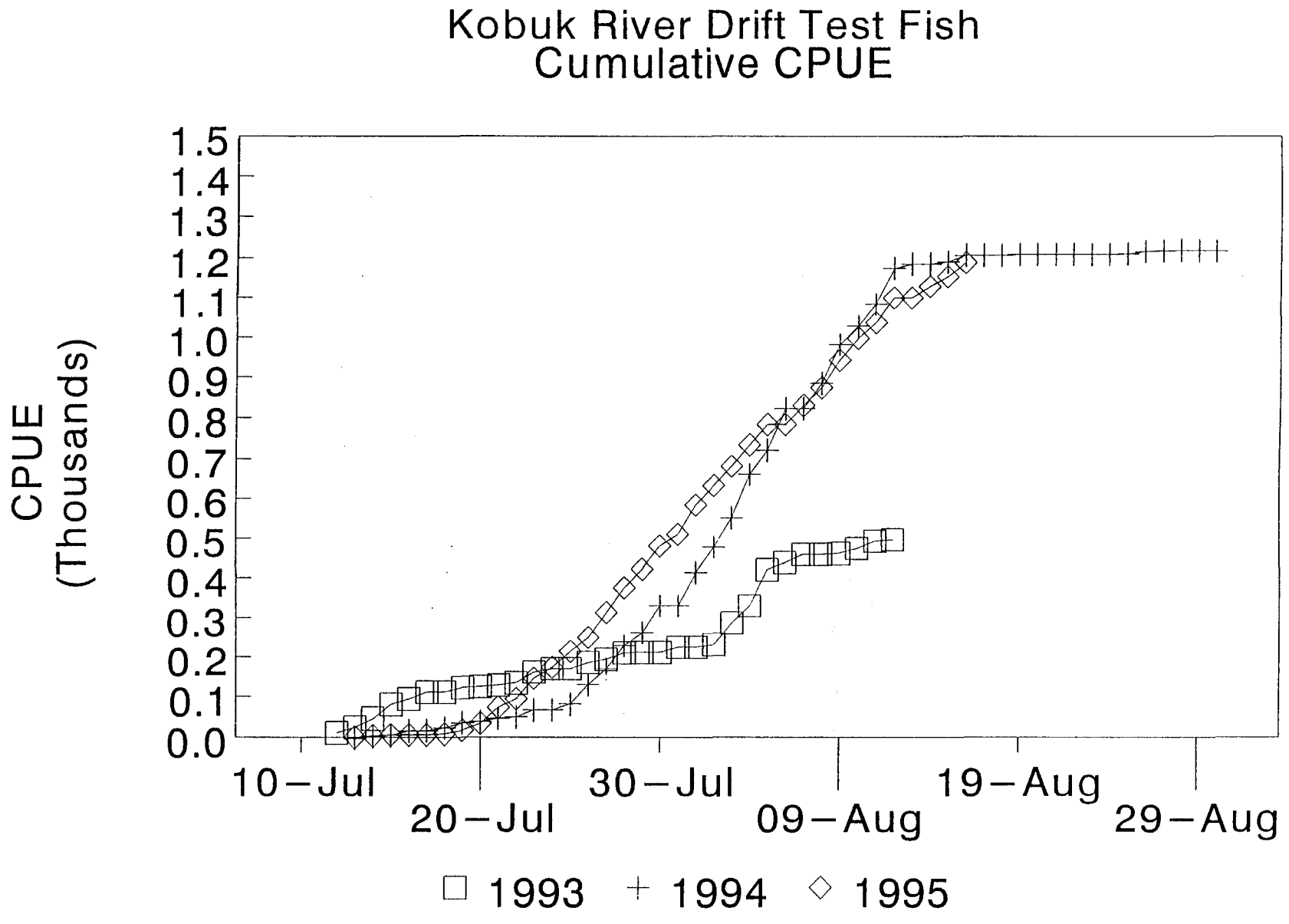


Figure 5. Kobuk River drift test fish cumulative CPUE, 1993–1995.

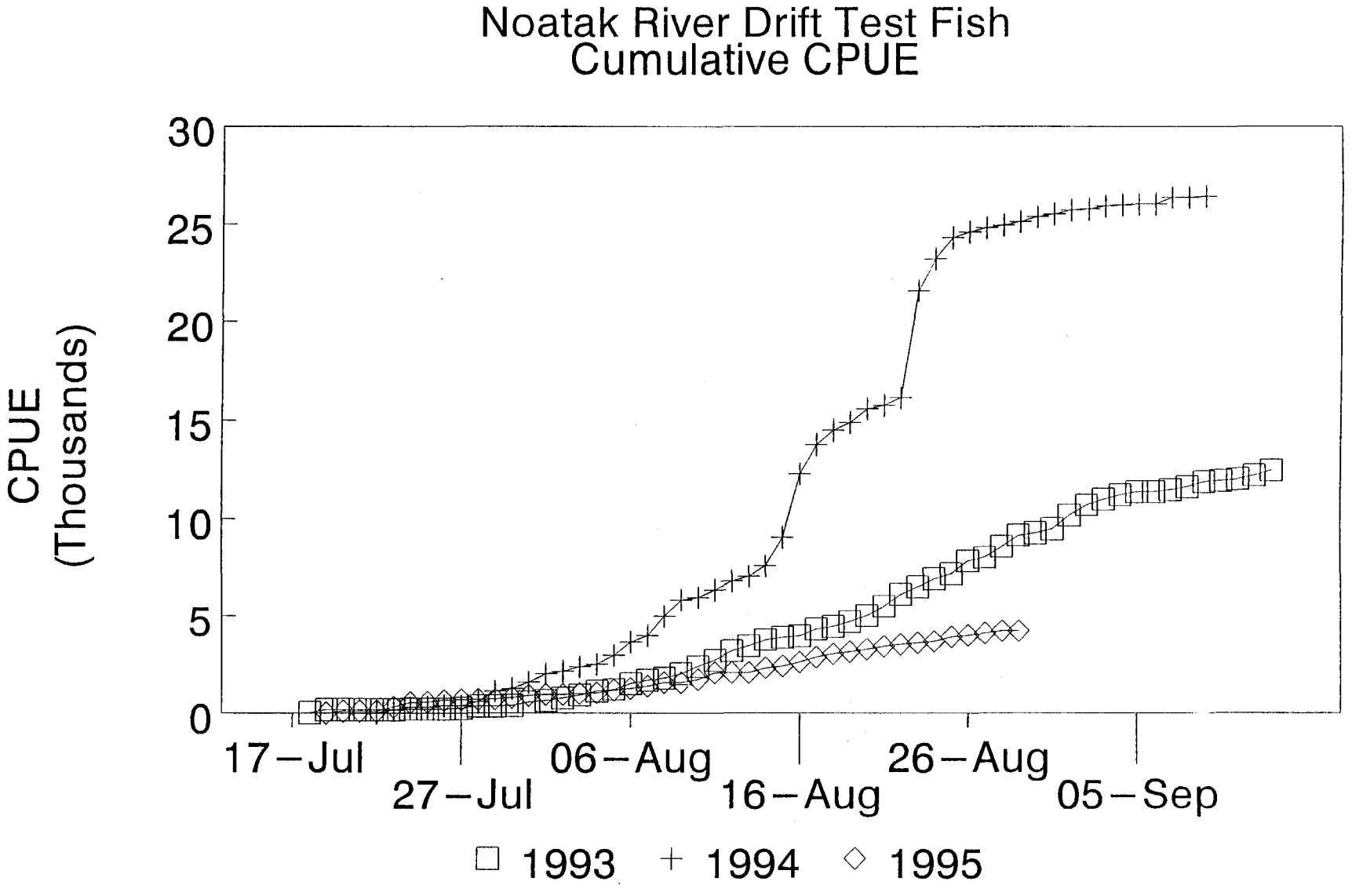


Figure 6. Noatak River test fish cumulative CPUE for the Right Bank, 1993–1995.

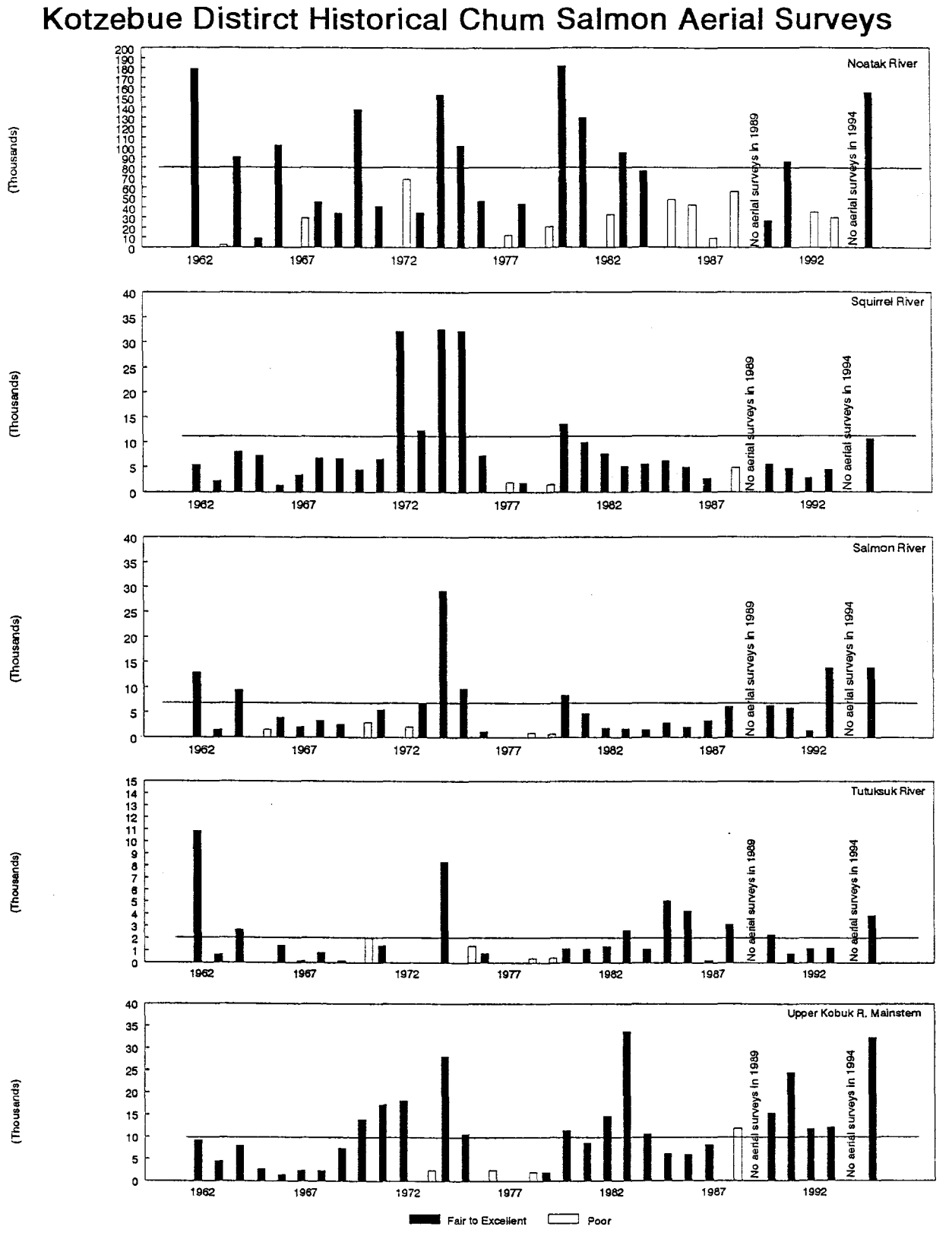


Figure 7. Kotzebue District peak aerial surveys of chum salmon in the Noatak, Squirrel, Salmon, Tutuksuk and Upper Kobuk Mainstem Rivers. The horizontal line indicates the escapement goals for these rivers. These goals were established in the mid-1980's using limited information. No aerial surveys were conducted in 1989 or 1994 due to poor weather.