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Kotzebue District Fisheries Report, 1997

to the

Alaska Board of Fisheries

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1997 KOTZEBUE SOUND SALMON SEASON SUMMARY

History

The Kotzebue district supports the northernmost commercial salmon fishery in Alaska (Figure 1). The Kotzebue District is divided into three subdistricts. Subdistrict 1 contains six statistical areas (Figure 2).

The recent commercial fishery opened under state management in 1962. Salmon harvests consist of primarily chum salmon although limited amounts of Dolly Varden and a few chinook salmon are harvested as well. There are 215 commercial permit holders, of which an average of 146 were active over the ten year period 1986 to 1995. Eighty-seven percent of the permittees are residents of the district and 99 percent are residents of the state.

The earliest sales of salmon in the Kotzebue District were in 1909 when Lockhart's store purchased 21,906 pounds of salmon from local eskimoes and resold it at $0.05/lb. Of that, 21,366 pounds were sold to gold miners on the Kobuk River drainage and 540 pounds were sold to a company in Seattle. A commercial fishery occurred from 1914 to 1918. Salmon were canned and the bulk of the harvest was thought to have been sold to miners working in the upper Kobuk River Drainage. The next organized commercial fishery began under state management in 1962 and continues to the present. The current fishery became fully developed in the mid- 1970s. The fishery displayed a gradually declining pattern of overall run strength with four year cycles of stronger followed by weaker returns. In 1987, the fisheries managers began a rebuilding program with an emphasis on attaining escapement goals. Prior to 1987, harvest had been proportional to total return. During the last few years, poor market conditions have caused harvests to fall short of their potential and consequently escapements have been very strong.

General Information

Each commercial fisherman is limited to 150 fathoms of gear. These gillnets are generally operated as a single unit of gear, although the nets are occasionally broken down to single 50 fathom shackles. Most gillnets are made of 5-7/8 inch stretched measure multifillament web. 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

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 resources, the Noatak River sonar was not in operation in 1997. Noatak R. sonar escapement counts had been used with strong consideration in the management of the final third of the season.

Age composition of the catch was 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 influences the fishery managers evaluation of the catch statistics. Weak 4 year old age classes tend to depress mid-season catches (Table 5, Figure 4).

COMMERCIAL SEASON SUMMARY

Inseason Management

A preseason meeting was held with fishermen in coordination with an Arctic-Yukon-Kuskokwim (AYK) chum salmon marketing seminar to discuss inseason management. Fishermen were told that management strategy would be similar to recent years as long as escapements were being achieved. This would ensure a consistent marketable quality flesh. The marketing portion of the meeting stressed quality. With good quality and the currently low salmon prices, previously closed markets now may be able to afford fresh and frozen salmon.

The Kotzebue Sound commercial salmon season was opened July 10 by emergency order as established by regulation. Generally, the first three periods are scheduled to be 24 hours in length to assess the early portion of the run as there are no other indicators. There are normally two openings per week beginning on Monday and Thursday. However, with the demand for higher quality, limited markets and only one buyer, these openings were shortened. Commercial openings were coordinated between the processor, local buyer and the Fish and Game office. Once a fishing period was decided on, the department would fax or call in a Public Service Announcement (PSA) to the local radio station which then would air the announcement.

From the onset of the commercial season, the lone buyer requested frequent openings and reduced fishing time instead of the long, bi-weekly fishing periods. All commercial openings were coordinated with the buyer for another reason, so that fish purchased could be shipped and processed in a timely manner. Scheduling openings with this method kept salmon at a high quality which enabled processors to market Kotzebue chum salmon. A total of thirty-three openings were fished in 1997 for a total of 396 hours. This is very near the historical average total fishing time of 405. Commercial fishing periods were all 12 hours in length during the 1997 season. Because of the low salmon prices, fishermen concentrated their efforts close to Kotzebue (Statistical Area 331-01) to minimize the costs of fuel and oil. Sixty percent of the fish were harvested from this statistical area (Table 4, Figure 2).

The buyer contacted the department concerning the possibility of using an average weight for all chum salmon before the season began. The processor and local buyer were using any means available to reduce the cost of handling fish. The buyer began using the average weight of 8.0 pounds during the second opening, the average weight from the first opening. 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 on a sample weighing technique that will fairly determine the average weight of the fish purchased". Fishermen agreed to this and the buyer continued purchasing fish in this manner for the remainder of the season.

Commercial catch statistics from openings on Monday, Tuesday and Wednesday were combined to compare to historical data for the first opening of the week. Statistics from openings on Thursday, Friday and Saturday were combined to compare to historical data for the second opening of the week (Table 3, Figure 3). This was done to compare this year's more frequent openings to historical bi-weekly period data. Commercial fishing periods this year began with 12 hours of fishing time. Because of the very constant rate of catch throughout the season, the length of fishing time never changed. Fishing periods were on Monday, Tuesday, Thursday and Friday from 6:00 a.m. to 6:00 p.m. Occasionally the buyer requested a Wednesday opening. These usually occurred after a poor commercial catch on the preceding day due to poor weather conditions and were allowed.

The Commercial harvest in the Kotzebue District (Figure 1) during 1997 consisted of 142,720 chum salmon, 45 chinook salmon, and 3,320 Dolly Varden (Table 1). This translates to a total weight of 1,141,741 pounds of chum salmon (average weight 8.0) at $.16 per pound, 649 pounds of chinook salmon (average weight 14.4) at an average of $1.02 per pound, and 23,203 pounds of Dolly Varden (average weight 7.0) at an average of $.20 per pound. This commercial chum harvest was substantially below the projected harvest of 250,000-350,000 salmon. The shortfall was due primarily to a weak market. However, the run strength was probably below average as well. The harvest was well below the 18 year (1979-1996) average of 272,000. The total ex-vessel value was $187,978 to Kotzebue area fishermen with an average of $2,764 for each participating permit holder (Table 2). The lone buyer packed the fish in ice and flew them out in the round to Anchorage for processing.

There were 68 permits that fished this year. The last two years represent the fewest number of participants since the late 1960's. The low fishing effort is attributed to construction related employment opportunities available in the region and low salmon prices

.Generally, 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. In 1997, age-5 salmon dominated the first three-fourths of the season while age-4 salmon dominated the final quarter of the season. The presence of age-6 salmon was 4-5 higher than the historical average throughout the season. Only 1987 had a greater abundance of age-6 salmon (11%) than 1997 (10.2%). There was also a small percentage of 7 year old salmon which are normally quite rare. Age-3 salmon remained well below average the entire season. This may be the result of a continuing trend of older fish returning to spawn (Table 6).

A test fishery occurred for the fifth year on the Kobuk River. Test fish indices were monitored for run strength and timing, providing managers with the only reliable escapement information in the district. Data collected from the Kobuk River test fishery will be available in report form on a later date. Contact with the Kobuk River subsistence fishermen with nets near Kiana was maintained. No escapement project has operated on the Noatak River since 1994.

Enforcement

A single Fish and Wildlife Protection enforcement officer stationed in Kotzebue conducted patrols via airplane to monitor openings and closures. Occasionally during the openings, patrols were

conducted by boat with the Department of Fish and Game employees to check permits, identification cards and helpers licenses. Because of the dedicated visibility of enforcement, the fishery was very orderly.

Sikusuilaq Hatchery

The total predicted return of hatchery salmon was 90,000. Forty-seven percent of the commercial catch was sampled with a total of 35 adipose clipped chum salmon found. From the 35 heads sent in, 12 heads were lost and only 2 of the remaining heads were found with tags in them. Both of these tags were from the 1993 brood year. Due to the lack of tag information, no conclusions can be made of the hatchery contribution for 1997.

ESCAPEMENT

A test fishing project located in Kiana monitored chum salmon run strength and timing into the Kobuk River. The test fish crews in Kiana also visited with subsistence fishermen throughout the season to monitor subsistence catches. As mentioned, previously, no inseason salmon escapement monitoring project was operated on the Noatak River this year.

The test fishing cumulative index of 797 from the Kobuk River in 1997 indicated escapements were achieved (Table 7, Figure 5). In 1993, a cumulative index of 494 was achieved. That same year, Kobuk River escapement goals by aerial survey under good conditions were just met. This year's cumulative test fish index (797) was roughly 60% greater than 1993's cumulative index. This years migration timing was longer than average. Even though subsistence catches were some of the earliest recorded, the peak of the Kobuk River test fishing index did not occur until the final week of the project.

Aerial survey conditions this year were some of the worst in recent years. Aerial surveys in the Kotzebue District typically begin in August. Because of constant cloudy skies and turbid water conditions, surveys were not conducted until the second week of September. Surveys on the lower Kobuk River tributaries (Salmon R., Squirrel R. & Tutuksuk R.) were conducted two weeks past peak spawning. Assessment of the escapements into those tributaries was not possible. A survey on the Upper Kobuk River index area under poor conditions counted roughly 85% of the escapement goal by aerial survey. Therefore, escapement goals for this index area were most likely met. (Figure 6). The Noatak River was never surveyed due to poor conditions. Because no aerial survey and main river sonar project were conducted, the department does not know what the escapement levels were into the Noatak River. Some of the earliest subsistence catches of chum salmon were recorded. However, spawn timing of salmon by aerial survey seemed to be normal. This would indicate that the run was extended. The Kobuk River test fish indicated that as well with a near linear line without an incline at the beginning or a decline at the end of the season.

DOLLY VARDEN

Spawning and over-wintering Dolly Varden (locally called trout) typically migrate along the northern shore of Kotzebue Sound during the third week of August. Even with a reduced number of

fishermen and a concentration of their effort near town, the incidental catch of trout was well above average. There were 3,320 Dolly Varden were sold with an average weight of 7.0 pounds. The migration of Dolly Varden into the Kotzebue District was also one of the earliest in recent memory. The migration continued through it's normal pattern, declining the third week of August. This may indicate an above average return of over-wintering Dolly Varden into the district. The commercial harvest has been as much as 7,700 but averages around 2,000.

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 1997 commercial season. Sheefish are caught and sold predominantly between mid-November and late March. The commercial sheefish fishery allows subsistence fishermen to sell part of their winter catch. There were no commercially sold sheefish reported in 1997 (Table 8).

1998 OUTLOOK

The outlook for the 1998 season is based on the returning age classes of the 1997 season. During the 1998 season, the four and five year components of the return are expected to be near average, while the six 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 of 200,000 to 350,000 chum salmon, if market conditions can accept that level of harvest.

Table 1. Commercial catches of chum salmon, chinook salmon and Dolly Varden by period in the Kotzebue District, 1997. [a]

Period	Date	Hours Fished	Number of Fishermen	Catch Rate (chum)	Chum			Chinook			Dolly Varden		
					Number	Pounds	Avg. Wt.	Number	Pounds	Avg. Wt.	Number	Pounds	Avg. Wt.
1	10-Jul-97	12	6	13.4	967	7,736	8.0	1	13	13.0	1	10	10.0
2	11-Jul-97	12	1	5.8	70	560	8.0	0			0		
3	14-Jul-97	12	10	9.5	1,135	9,080	8.0	0			1	18	18.0
4	15-Jul-97	12	11	11.7	1,547	12,376	8.0	0			0		
5	17-Jul-97	12	16	21.3	4,095	32,760	8.0	2	23	11.5	29	188	6.5
6	18-Jul-97	12	18	15.4	3,337	26,696	8.0	0			33	261	7.9
7	21-Jul-97	12	24	18.2	5,245	41,960	8.0	4	29	7.3	58	349	6.0
8	22-Jul-97	12	24	12.8	3,684	29,472	8.0	2	24	12.0	31	229	7.4
9	24-Jul-97	12	11	21.7	2,863	22,904	8.0	1	15	15.0	4	31	7.8
10	25-Jul-97	12	20	18.1	4,332	34,656	8.0	2	29	14.5	30	200	6.7
11	28-Jul-97	12	32	21.1	8,106	64,848	8.0	3	41	13.7	76	544	7.2
12	29-Jul-97	12	21	20.8	5,242	41,936	8.0	1	10	10.0	37	263	7.1
13	31-Jul-97	12	31	23.6	8,790	70,320	8.0	2	36	18.0	159	1,146	7.2
14	1-Aug-97	12	36	28.6	12,375	99,000	8.0	3	39	13.0	274	1,939	7.1
15	4-Aug-97	12	10	9.2	1,108	8,864	8.0	0			45	318	7.1
16	5-Aug-97	12	22	15.8	4,178	33,424	8.0	2	30	15.0	204	1,434	7.0
17	6-Aug-97	12	26	22.4	7,003	56,005	8.0	3	66	22.0	191	1,333	7.0
18	7-Aug-97	12	32	18.8	7,234	57,872	8.0	4	69	17.3	100	702	7.0
19	8-Aug-97	12	32	22.5	8,621	68,968	8.0	2	25	12.5	177	1,239	7.0
20	11-Aug-97	12	25	16.2	4,870	38,960	8.0	1	28	28.0	351	2,517	7.2
21	12-Aug-97	12	35	15.7	6,600	52,800	8.0	4	34	8.5	468	3,361	7.2
22	14-Aug-97	12	27	15.1	4,886	39,088	8.0	0			346	2,125	6.1
23	15-Aug-97	12	25	15.7	4,698	37,584	8.0	0			239	1,670	7.0
24	18-Aug-97	12	20	18.7	4,477	35,816	8.0	1	26	26.0	221	1,566	7.1
25	19-Aug-97	12	17	18.6	3,788	30,304	8.0	0			92	662	7.2
26	20-Aug-97	12	22	18.8	4,976	39,808	8.0	1	5	5.0	71	483	6.8
27	21-Aug-97	12	19	16.2	3,699	29,592	8.0	1	8	8.0	26	195	7.5
28	22-Aug-97	12	24	19.5	5,618	44,944	8.0	1	25	25.0	36	242	6.7
29	25-Aug-97	12	17	17.2	3,504	28,032	8.0	0			16	130	8.1
30	26-Aug-97	12	15	10.9	1,957	15,656	8.0	1	19	19.0	2	21	10.5
31	27-Aug-97	12	10	13.4	1,603	12,824	8.0	1	29	29.0	2	27	13.5
32	28-Aug-97	12	11	12.1	1,593	12,744	8.0	1	16	16.0	0		
33	29-Aug-97	12	10	4.3	519	4,152	8.0	1	10	10.0	0		
Totals		396	68	5.3	142,720	1,141,741	8.0	45	649	14.4	3,320	23,203	7.0

[a] Chum salmon were weighed during the first commercial opening only. Chum salmon for all other periods were considered to be 8 pounds.

Table 2. Kotzebue District chum salmon fishery historical information, 1981-1997.

	Commercial Catch					Escapement (goals)				
Year	Number Caught	Number Permits	Average Catch per Permit	Total Value [a]	Value per Fishermen	Squirrel R. (11,500)	Salmon R. (7,000)	Tutuksuk R. (2,000)	Upper Kobuk R. (10,000)	Noatak R. (85,000)
1962	129,948	84	1,547	$4,500	$54	5,384	12,936	10,841	9,224	177,080
1963	54,445	61	893	$9,140	$150	2,200	1,535	670	4,535	2,005 [b]
1964	76,449	52	1,470	$34,660	$667	8,009	9,353	2,685	7,985	89,798
1965	40,025	45	889	$18,000	$400	7,230	1,500 [b]		2,750	6,152
1966	30,764	44	699	$25,000	$568	1,350	3,957	1,383	1,474	101,760
1967	29,400	30	980	$28,700	$957	3,332	2,116	169	2,495	29,120 [b]
1968	30,212	59	512	$46,000	$780	6,746	3,367	823	2,370	44,896
1969	59,335	52	1,141	$71,000	$1,365	6,714	2,561	159	7,500 [c]	34,013
1970	159,664	82	1,947	$186,000	$2,268	4,418	3,000 [b]	2,000 [b]	13,908	138,145
1971	154,956	91	1,703	$200,000	$2,198	6,628	5,453	1,384	17,202	41,056
1972	169,664	104	1,631	$260,000	$2,500	32,126	2,073 [b]		18,155	67,601 [b]
1973	375,432	148	2,537	$925,000	$6,250	12,345	6,891		2,470 [b]	32,144
1974	627,912	185	3,394	$1,822,784	$9,853	32,523	29,190	8,312	28,120	151,889
1975	563,345	267	2,110	$1,365,648	$5,115	32,256	9,721	1,344 [b]	10,702	97,811
1976	159,796	220	726	$580,375	$2,638	7,229	1,161	758	2,522 [b]	45,779
1977	195,895	224	875	$1,033,950	$4,616	1,964 [b]				11,963 [b]
1978	111,494	208	536	$575,260	$2,766	1,863	814 [b]	368 [b]	1,981 [b]	43,342
1979	141,623	181	782	$990,263	$5,471	1,500 [b]	674 [b]	382 [b]	2,008	17,515 [b]
1980	367,284	176	2,087	$1,446,633	$8,220	13,563	8,456	1,165	11,472	174,751
1981	677,239	187	3,622	$3,246,793	$17,363	9,854	4,709	1,114	8,648	116,352
1982	417,790	199	2,099	$1,961,518	$9,857	7,690	1,821 [c]	1,322	14,674	20,871 [b]
1983	175,762	189	930	$420,736	$2,226	5,115	1,677	2,637	33,746	82,817
1984	320,206	181	1,769	$1,148,884	$6,347	5,473	1,471	1,132	10,621	72,900
1985	521,406	189	2,759	$2,137,368	$11,309	6,160	2,884	5,089	6,278	46,380 [b]
1986	261,436	187	1,398	$931,241	$4,980	4,982	1,971	4,257	6,015	41,535 [b]
1987	109,467	160	684	$515,000	$3,219	2,708 [c]	3,333	206	8,210	8,295 [b]
1988	352,915	193	1,829	$2,581,333	$13,375	4,848 [b]	6,208	3,122	11,895 [b]	54,569 [b]
1989	254,617	165	1,543	$613,823	$3,720					[c]
1990	163,263	153	1,067	$438,044	$2,863	5,500	6,335	2,275	15,355	26,345
1991	239,923	142	1,690	$437,948	$3,084	4,606	5,845	744	24,525	85,690
1992	289,184	149	1,941	$533,731	$3,582	2,765	1,345	1,162	11,803	35,036 [b]
1993	73,071	114	641	$235,061	$2,062	4,463	13,880	1,196	12,158	30,210 [b]
1994	153,452	109	1,408	$233,512	$2,142					[c]
1995	290,730	92	3,160	$316,031	$3,435	10,605	13,988	3,901	35,725	167,120
1996	82,110	55	1,493	$56,310	$1,024	21,795	21,740	8,200	74,770	336,940
1997	142,720	68	2,099	$187,978	$2,764	4,779 [b]	1,181 [b]	164 [b]	8,513 [b]	[c]

[a] Some estimates between 1962 and 1981 include only chum value which in figures represent represent over 99% of the total value. Figures after 1981 represent the chum value as well as incidental species such as char, whitefish and other salmon.

[b] Poor survey conditions or incomplete, early or late survey.

[c] Due to unsatisfactory conditions, no aerial surveys were flown.

Table 3. Kotzebue District 1997 commercial and 18 year average catch statistics (1979-1996).

18 Year Avg.

Period	Hours	Number Permits	Catch [a]	CPUE	Prop. Catch	Cumulative Catch [a]	Cumulative CPUE	Cumulative Prop. Catch
1	24	37	3,265	4.5	0.000	3,084	4.5	0.011
2	23	62	5,373	6.1	0.000	8,457	5.0	0.031
3	23	86	10,135	7.1	0.000	18,591	5.9	0.068
4	24	105	18,133	9.0	0.000	36,725	6.9	0.135
5	26	115	22,355	9.9	0.000	59,079	7.6	0.218
6	28	121	29,379	15.0	0.000	85,194	8.3	0.314
7	32	124	35,085	14.3	0.000	118,330	9.0	0.436
8	35	136	38,869	14.0	0.000	152,880	9.3	0.563
9	37	121	37,284	14.4	0.000	190,164	10.0	0.700
10	36	130	42,662	15.8	0.000	225,716	10.3	0.831
11	39	120	24,710	8.5	0.000	244,934	10.2	0.902
12	37	99	14,626	12.8	0.000	257,123	10.1	0.947
13	38	76	10,015	5.7	0.000	265,469	9.6	0.978
14	36	57	7,195	5.9	0.000	269,866	9.4	0.994
15	37	37	3,297	4.7	0.000	271,514	9.3	1.000

1997

Period	Hours	Number Permits	Catch	CPUE	Prop. Catch	Cumulative Catch	Cumulative CPUE	Cumulative Prop. Catch
1	24	7	1,037	6.2	0.007	1,037	6.2	0.007
2	24	12	2,682	9.3	0.019	3,719	8.2	0.026
3	24	23	7,432	13.5	0.052	11,151	11.1	0.078
4	24	30	8,929	12.4	0.063	20,080	11.6	0.141
5	24	23	7,195	13.0	0.050	27,275	12.0	0.191
6	24	35	13,348	15.9	0.094	40,623	13.0	0.285
7	24	39	21,165	22.6	0.148	61,788	15.2	0.433
8	36	32	12,289	10.7	0.086	74,077	14.2	0.519
9	24	42	15,855	15.7	0.111	89,932	17.8	0.630
10	24	35	11,470	13.7	0.080	101,402	16.8	0.710
11	24	33	9,584	12.1	0.067	110,986	15.8	0.778
12	36	31	13,241	11.9	0.093	124,227	20.1	0.870
13	24	27	9,317	14.4	0.065	133,544	19.6	0.936
14	36	20	7,064	9.8	0.049	140,608	18.6	0.985
15	24	16	2,112	5.5	0.015	142,720	18.3	1.000

[a] Cumulative catch and catch by period derived differently.

Table 4. Kotzebue District commercial chum salmon, chinook salmon, and Dolly Varden catch by statistical area,1997.

Statistical Area	Number of Fishermen	Chum Number	Chum Pounds	Chum Avg. Wt.	Chinook Number	Chinook Pounds	Chinook Avg. Wt.	Dolly Varden Number	Dolly Varden Pounds	Dolly Varden Avg. Wt.
331-01	64	85,739	685,912	8.0	23	337	14.7	1,645	11,419	6.9
331-02	22	15,042	120,336	8.0	16	225	14.1	1,317	9,363	7.1
331-03	9	3,762	30,096	8.0	1	10	10.0	56	329	5.9
331-04	13	18,306	146,429	8.0	3	61	20.3	205	1,405	6.9
331-05	1	63	504	8.0	0			8	63	7.9
331-06	18	19,808	158,464	8.0	2	16	8.0	89	624	7.0
Totals	**68**	142,720	1,141,741	8.0	45	649	14.4	3,320	23,203	7.0

Table 5. Historical average age composition by period for the recent 18 years (1979-1996) and 1997.

18 Year Average

		Percent				Catch by Age			
Period	Catch	3	4	5	6	3	4	5	6
1	3,265	0.4	31.8	62.2	5.6	13	1,038	2,031	183
2	5,373	0.8	39.7	54.5	5.0	43	2,133	2,928	269
3	10,135	1.3	39.8	53.0	5.9	132	4,034	5,371	598
4	18,133	1.2	48.4	46.5	3.9	218	8,776	8,432	707
5	22,355	1.3	46.5	46.9	5.2	291	10,395	10,484	1,162
6	29,379	1.8	53.0	42.2	2.9	529	15,571	12,398	852
7	35,085	2.6	57.1	37.5	2.8	912	20,034	13,157	982
8	38,869	4.0	60.2	33.6	2.2	1,555	23,399	13,060	855
9	37,284	5.1	58.8	33.4	2.7	1,901	21,923	12,453	1,007
10	42,662	5.3	62.0	31.1	1.7	2,261	26,450	13,268	725
11	24,710	9.5	65.0	24.1	1.4	2,347	16,061	5,955	346
12	14,626	11.0	60.3	26.8	2.0	1,609	8,820	3,920	293
13	10,015	9.9	61.5	26.3	2.3	991	6,159	2,634	230
14	7,195	9.4	61.3	28.0	1.3	676	4,411	2,015	94
15	3,297	4.4	66.6	27.6	1.4	145	2,196	910	46

1997

		Percent				Catch by Age			
Period	Catch	3	4	5	6	3	4	5	6
1	1,037	0.0	7.4	71.1	20.8	0	77	737	216
2	2,682	0.0	13.3	62.0	23.8	0	357	1,663	638
3	7,432	0.3	11.0	68.4	19.4	22	818	5,083	1,442
4	8,929	0.0	16.4	71.1	12.5	0	1,464	6,349	1,116
5	7,195	0.0	12.6	68.9	17.7	0	907	4,957	1,274
6	13,348	0.9	10.3	72.9	15.9	120	1,375	9,731	2,122
7	21,165	0.4	18.4	64.5	16.0	85	3,894	13,651	3,386
8	12,289	1.6	33.5	57.1	7.8	197	4,117	7,017	959
9	15,855	1.0	29.8	58.6	9.6	159	4,725	9,291	1,522
10	11,470	1.5	36.3	53.0	8.9	172	4,164	6,079	1,021
11	9,584	4.4	43.9	45.8	6.0	417	4,207	4,389	571
12	13,241	1.9	47.9	46.3	3.2	252	6,342	6,131	424
13	9,317	4.7	44.3	44.6	5.7	434	4,124	4,156	530
14	7,064	2.4	46.4	44.5	6.4	170	3,278	3,143	452
15	2,112	1.7	55.4	38.9	4.0	36	1,170	822	84

Table 6. Kotzebue District commercial age and sex composition of chum salmon, 1962-1997.[a]

Year	Sample Size	Percent Males	Percent Females	Percent Age Class Age-3	Age-4	Age-5	Age-6	Age-7
1962	69	26.1	73.9	7.2	63.8	27.5	1.4	0.0
1963	255	34.9	65.1	30.2	51.0	18.4	0.4	0.0
1964	463	43.6	56.4	52.9	44.9	1.7	0.4	0.0
1965	480	42.1	57.9	2.3	91.0	6.7	0.0	0.0
1966	430	40.2	59.8	10.0	67.2	22.8	0.0	0.0
1967	1,865	37.3	62.7	8.8	72.2	18.5	0.5	0.0
1968	1,989	48.2	51.8	21.2	58.1	19.8	0.9	0.0
1969	1,125	53.7	46.3	36.8	58.3	4.9	0.0	0.0
1970	267	45.3	54.7	3.7	91.0	5.2	0.0	0.0
1971	1,105	54.6	45.4	7.1	66.8	26.1	0.0	0.0
1972	980	50.9	49.1	15.8	59.5	24.1	0.6	0.0
1973	598	46.0	54.0	16.7	69.4	13.9	0.0	0.0
1974	350	47.1	52.9	28.6	63.4	7.7	0.3	0.0
1975	340	46.5	53.5	2.6	86.8	10.6	0.0	0.0
1976	566	47.9	52.1	11.1	51.4	37.3	0.2	0.0
1977	446	49.3	50.7	6.7	72.9	18.6	1.8	0.0
1978	579	49.9	50.1	10.5	57.5	31.8	0.2	0.0
1979 [b]	658	53.3	46.7	30.5	53.2	15.2	1.1	0.0
1980 [c]	710	56.3	43.7	15.1	78.2	6.6	0.1	0.0
1981 [d]	1,167	52.4	47.6	2.4	67.1	30.5	0.0	0.0
1982	983	48.8	51.2	5.9	48.3	40.3	5.5	0.0
1983 [e]	1,979	43.4	56.6	5.8	57.7	34.2	2.3	0.0
1984 [f]	2,933	50.2	49.8	14.6	64.4	19.7	1.3	0.0
1985 [g]	3,293	47.8	52.2	0.4	83.7	15.5	0.4	0.0
1986 [h]	3,095	46.0	54.0	0.3	18.6	78.9	2.2	0.0
1987 [i]	1,987	52.0	48.0	15.0	43.0	31.0	11.0	0.0
1988	3,324	48.0	52.0	6.5	74.8	16.9	1.7	0.1
1989	3,336	49.3	50.7	0.7	77.9	20.4	1.0	0.0
1990 [j]	2,497	49.4	50.6	2.3	45.6	50.7	1.4	0.0
1991	3,292	46.4	53.6	2.9	60.4	35.8	0.9	0.0
1992 [k]	3,706	39.0	61.0	0.9	58.5	37.5	3.1	0.0
1993 [l]	3,707	50.9	49.1	2.9	26.3	66.5	4.2	0.1
1994 [m]	3,744	44.8	55.2	3.3	63.0	30.8	2.9	0.0
1995	4,621	50.9	49.1	2.3	59.8	36.0	1.9	0.0
1996 [n]	2,386	50.9	49.1	0.9	36.9	52.3	9.5	0.4
18 Year Avg. (1979-199		47.8	52.2	6.8	58.1	32.9	2.3	0.0
1997	4,824	57.6	42.4	1.4	28.7	58.3	10.2	1.4

[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] Commercial openings 11 to 15 not sampled due to period closure.
[k] Commercial opening 12 was not sampled due to period closure.
[l] Commercial openings 6, 8, 10, 11, 12, 13, 14 and 15 were closed periods. Closed periods were sa for age and sex composition from commercial test nets and are included in the 1993 data.
[m] Commercial openings 14 and 15 were closed periods. Closed periods were sampled for age and composition from commercial test nets and are included in the 1994 data.
[n] The equivalent of commercial periods 8, 10, 11 and 15 were closed periods. These periods were s for age composition from commercial test nets and are included in the 1996 data.

Table 7. Kobuk River chum salmon drift test fishing mean daily and cumulative CPUE, 1993-1997.[a]

	1993		1994		1995		1996		1997	
Date	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
05-Jul										
06-Jul										
07-Jul										
08-Jul										
09-Jul							12.77	12.77	5.85	5.85
10-Jul							15.00	27.77	0.00	5.85
11-Jul							98.38	126.15	5.31	11.16
12-Jul	11.18	11.18			0.00	0.00	45.54	171.69	7.19	18.35
13-Jul	14.22	25.40	0.00	0.00	0.93	0.93	74.29	245.98	[b]	18.35
14-Jul	20.57	45.97	2.68	2.68	2.80	3.73	[b]	245.98	6.25	24.60
15-Jul	35.08	81.05	2.58	5.26	2.77	6.50	83.75	329.73	3.65	28.25
16-Jul	13.19	94.24	11.35	16.61	[b]	6.50	71.35	401.08	14.28	42.53
17-Jul	17.27	111.51	[b]	16.61	0.00	6.50	55.49	456.57	15.17	57.70
18-Jul	[b]	111.51	7.16	23.77	1.81	8.31	89.86	546.43	16.12	73.82
19-Jul	10.71	122.22	12.40	36.17	9.89	18.20	54.74	601.17 +	17.98	91.80
20-Jul	2.76	124.98 +	3.65	39.82	16.30	34.50	63.70	664.87	[b]	91.80
21-Jul	3.20	128.18	7.30	47.12	38.54	73.04	52.12	716.99	18.53	110.33
22-Jul	5.52	133.70	3.56	50.68	21.18	94.22	50.97	767.96	13.28	123.61
23-Jul	27.15	160.85	16.49	67.17	50.58	144.80	91.36	859.32	10.79	134.40
24-Jul	9.06	169.91	[b]	67.17	28.46	173.26	91.89	951.21	22.86	157.26
25-Jul	[b]	169.91	14.38	81.55	40.16	213.42	76.80	1,028.01	21.57	178.83
26-Jul	15.22	185.13	47.65	129.20	35.15	248.57	55.68	1,083.69	14.66	193.49
27-Jul	8.06	193.19	40.66	169.86	63.94	312.51 +	29.79	1,113.48	18.46	211.95
28-Jul	16.36	209.55	57.83	227.69	62.49	375.00	49.06	1,162.54	30.53	242.48
29-Jul	0.93	210.48	33.62	261.31	46.11	421.11	70.13	1,232.67	28.13	270.61
30-Jul	0.92	211.40	69.21	330.52 +	57.86	478.97	35.29	1,267.96	22.33	292.94
31-Jul	12.58	223.98	[b]	330.52	29.89	508.86	82.27	1,350.23 *	32.57	325.51 +
01-Aug	[b]	223.98	82.16	412.68	72.91	581.77	167.67	1,517.90	41.41	366.92
02-Aug	6.74	230.72	65.12	477.80	48.71	630.48 *	62.02	1,579.92	22.41	389.33
03-Aug	54.49	285.21 *	71.79	549.59	48.40	678.88	48.7	1,628.62	35.21	424.54 *
04-Aug	44.23	329.44	108.98	658.57 *	53.00	731.88	65.93	1,694.55	26.67	451.21
05-Aug	89.30	418.74 +	59.74	718.31	49.95	781.83	60.33	1,754.88	24.47	475.68
06-Aug	18.60	437.34	102.56	820.87	[b]	781.83	80.47	1,835.35	42.25	517.93
07-Aug	20.52	457.86	[b]	820.87	46.39	828.22	90.99	1,926.34	36.00	553.93
08-Aug	[b]	457.86	62.75	883.62	44.02	872.24	146.94	2,073.28 +	45.07	599.00 +
09-Aug	1.84	459.70	96.86	980.48 +	68.22	940.46 +	106.11	2,179.39	55.14	654.14
10-Aug	12.63	472.33	45.83	1,026.31	56.33	996.79	56.95	2,236.34	[b]	654.14
11-Aug	18.11	490.44	57.02	1,083.33	37.95	1,034.74	[b]	2,236.34	43.75	697.89
12-Aug	3.74	494.18	90.54	1,173.87	63.92	1,098.66	72.29	2,308.63	37.36	735.25
13-Aug			11.36	1,185.23	[b]	1,098.66	114.63	2,423.26	45.93	781.18
14-Aug			[b]	1,185.23	29.35	1,128.01	158.13	2,581.39	16.01	797.19
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						
31-Aug										

[a] The "*" indicate the first and third quartiles and "+" indicates the mid-way point

[b] Regular day off.

Table 8. Kotzebue District winter commercial Sheefish harvest statistics, 1967-1997. [a]

Year [b]	No. of Fishermen	No. of Fish	Pounds Total	Pounds Average	Price/ Pound	Estimated Value
1967 [c]		4,000	26,000	6.5	$0.20	$5,200.00
1968	10	792	4,752	6.0	$0.22	$1,045.44
1969	17	2,340	15,209	6.5	$0.25	$3,802.25
1970 [c]		2,206		0.0	$0.14	
1971	4	73	720	9.9	$0.13	$93.60
1972	5	456	4,071	8.9	$0.16	$651.36
1973	11	2,322	15,604	6.7	$0.20	$3,120.80
1974	6	1,080 [d]	6,265	5.8	$0.30	$1,879.50
1975	[c]	2,543 [d]	24,161	9.5	$0.30	$7,248.30
1976	14	2,633	19,484	7.4	$0.30	$5,845.20
1977	2	566	5,004	8.8	$0.30	$1,501.20
1978	11	2,879	26,200	9.1	$0.40	$10,480.00
1979 [c]						
1980	4	1,175	8,225	7.0	$0.50	$4,112.50
1981	1	278	1,836	6.6	$0.75	$1,377.00
1982	11	2,629 [f]	17,376	6.6	$0.75	$13,032.00
1983	8	1,424	13,395	9.4	$0.50	$6,697.50
1984	5	927 [d]	10,403	11.2	$0.55	$5,721.65
1985	4	342 [d]	3,902	11.4	$0.51	$1,990.02
1986	2	26	312	12.0	$0.75	$234.00
1987	3	670	5,414	8.1	$0.49	$2,652.86
1988	3	943	7,373	7.8	$0.45	$3,317.85
1989	8	2,335	16,749	7.2	$0.51	$8,541.99
1990 [c]	6	687	5,617	8.2		
1991	5	852	8,224	9.7	$0.50	$4,112.00
1992	3	289	2,850	9.9	$0.65	$1,852.50
1993	1	210 [d]	1,700	8.1	$0.50	$850.00
1994 [e]						
1995	1	161	1,840	11.4	$0.50	$920.00
1996	2	308	3,002	9.7	$0.44	$1,308.50
1997 [e]						

[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 or pounds not always reported. Estimates were based on average weight from other reported sales which documented the number and weight of fish.

[e] No reported commercial catches.

[f] Estimate based on historical average weight.

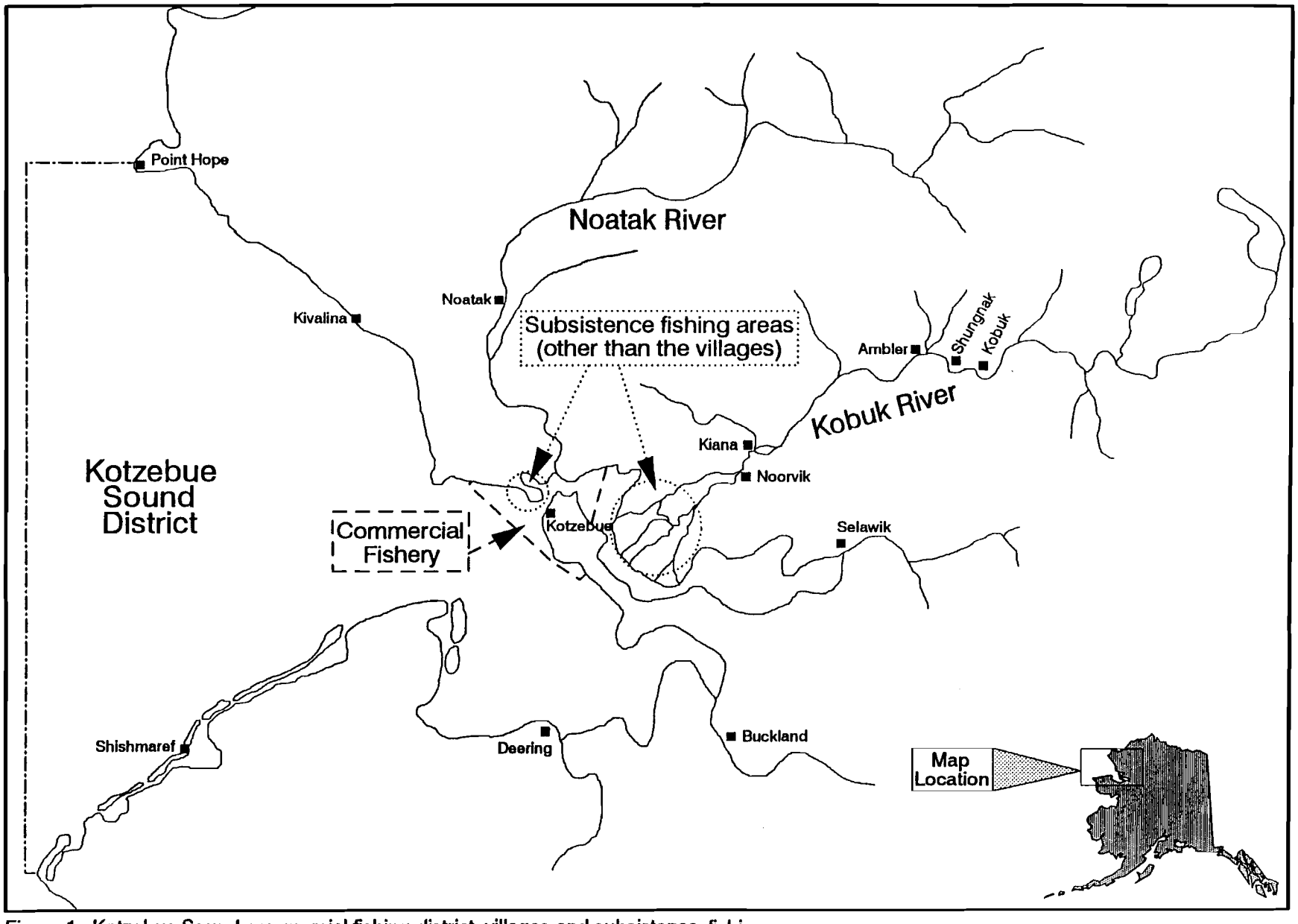


Figure 1. Kotzebue Sound commercial fishing district, villages and subsistence fishing areas.

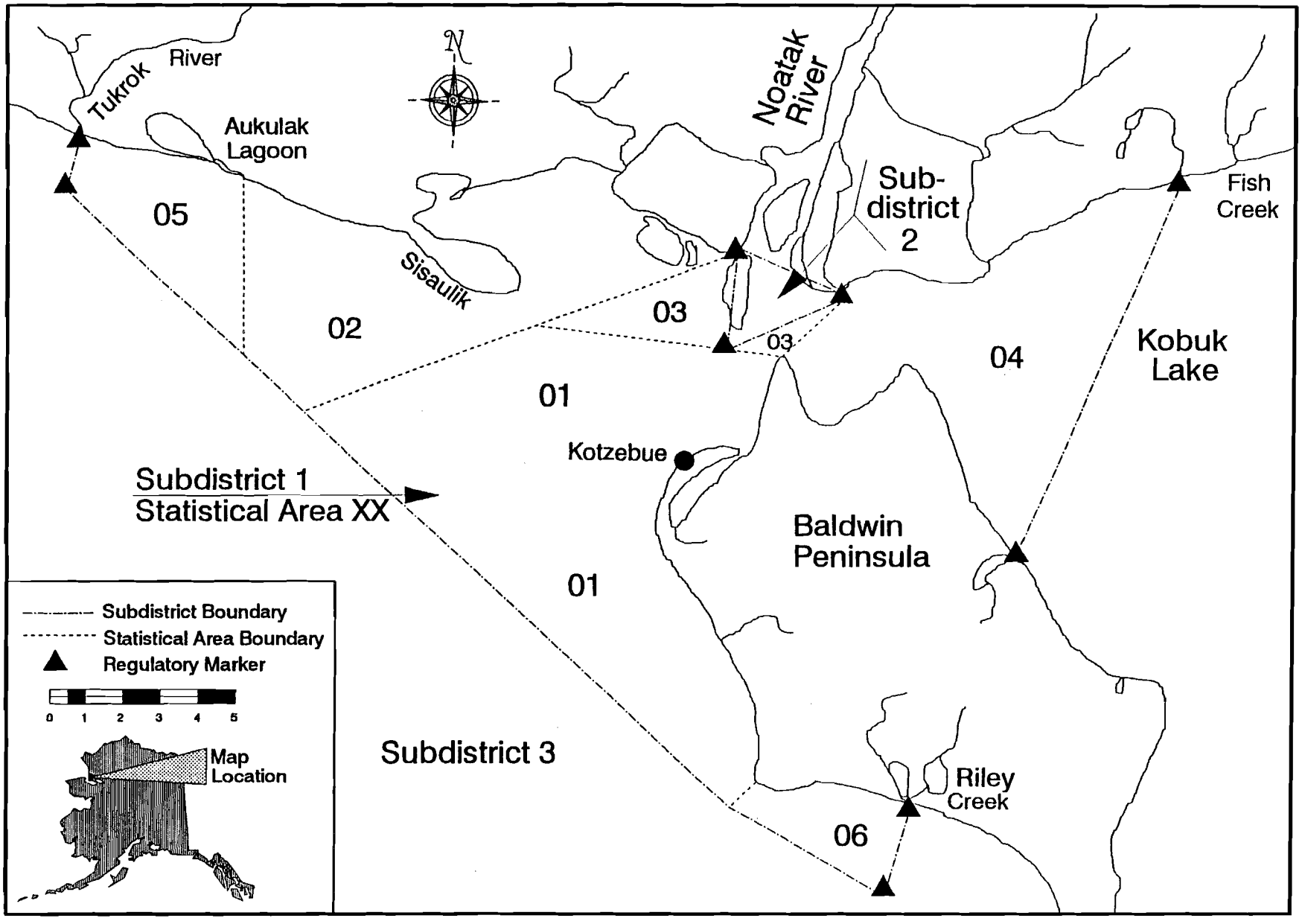
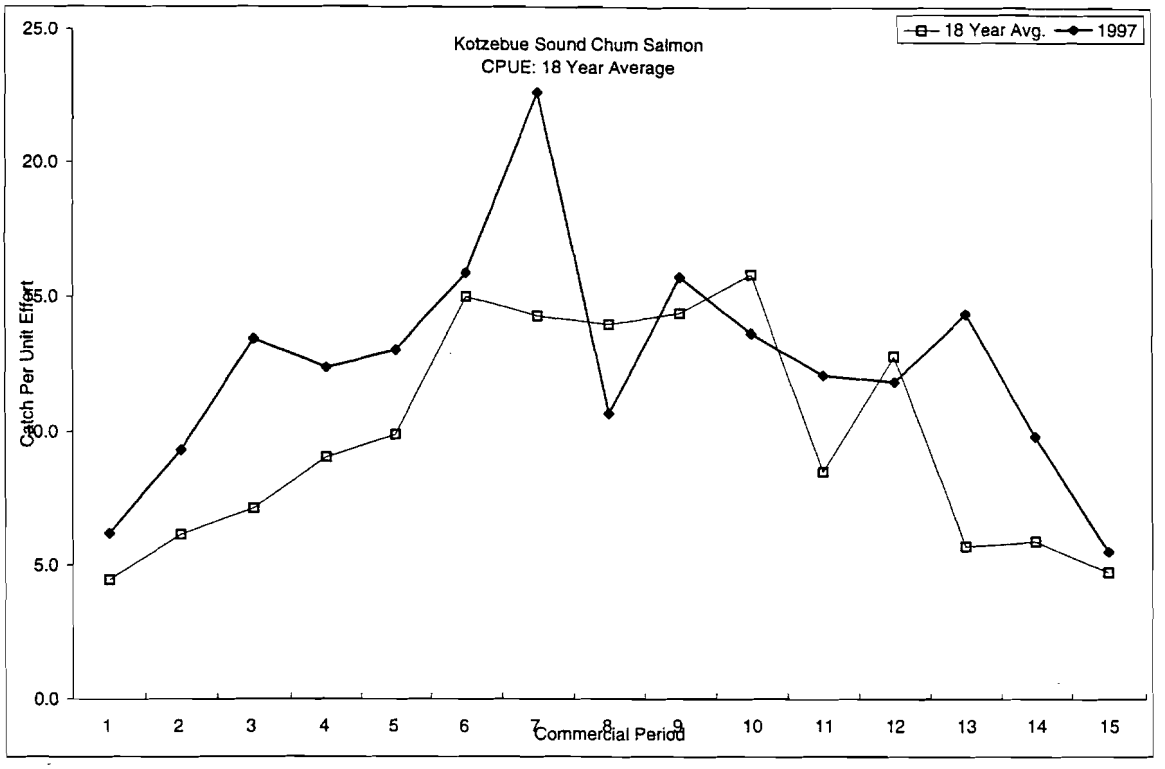


Figure 2. Kotzebue Sound commercial fishing subdistricts and statistical areas.



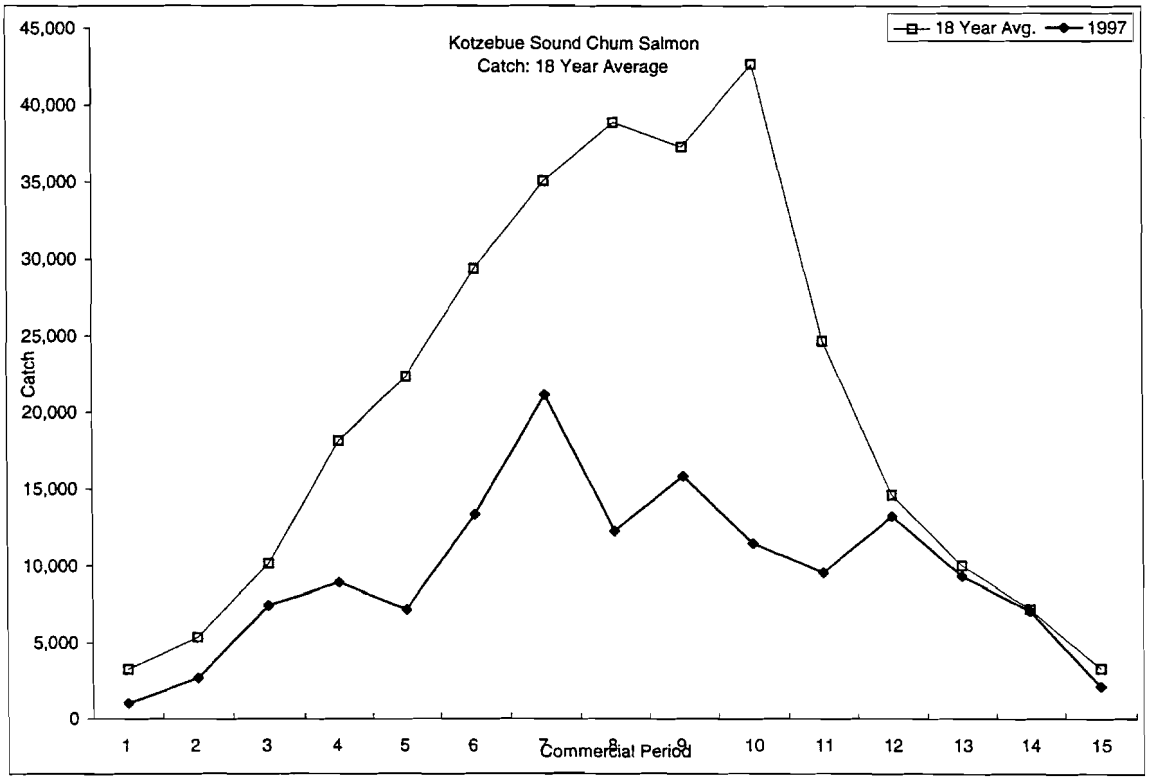


Figure 3. Kotzebue District chum salmon previous 18 year average (1979-1996) commercial catch and catch per unit effort as compared to 1997.

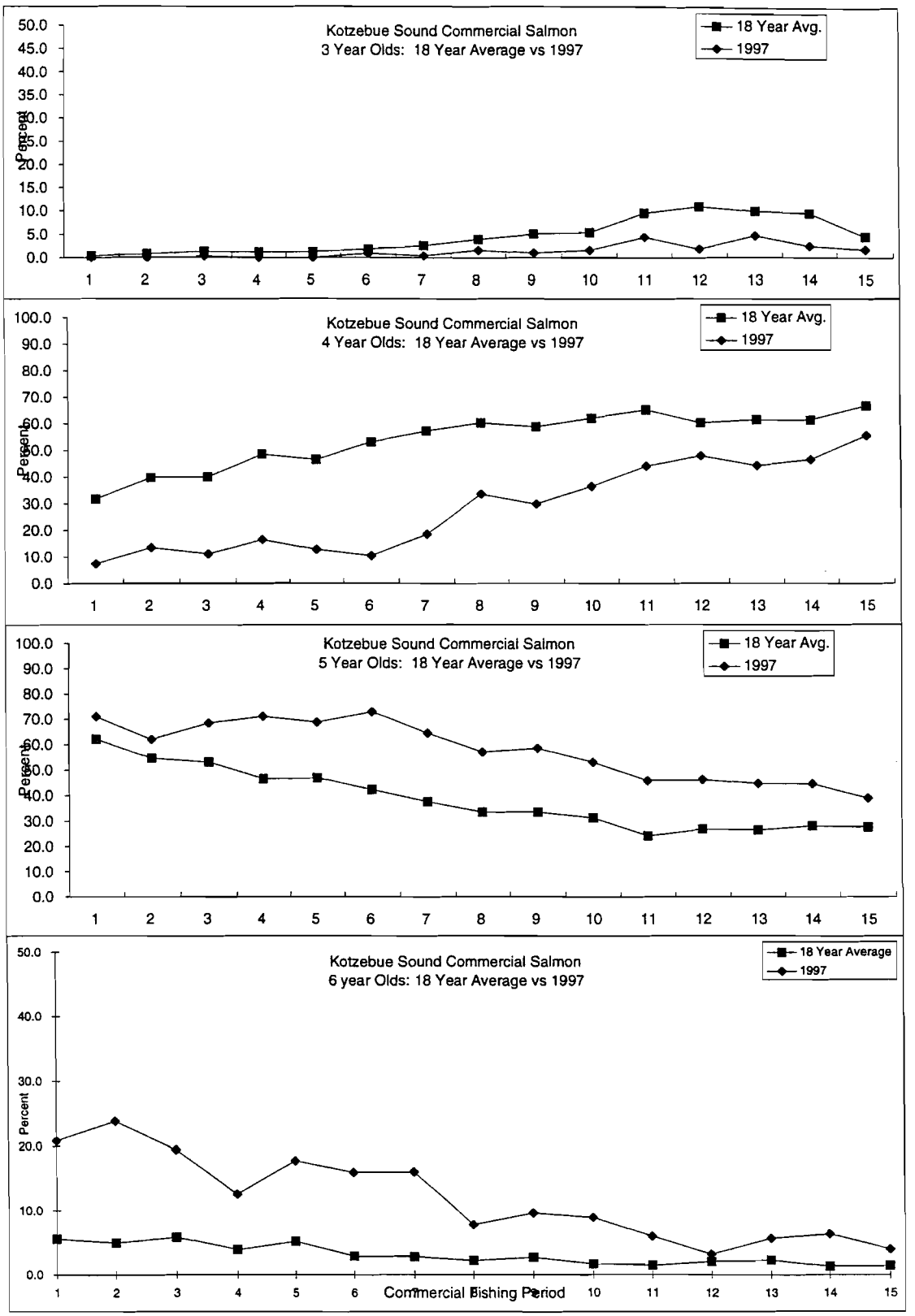


Figure 4. Kotzebue District chum salmon 18 year average age composition by period, compared to 1997.

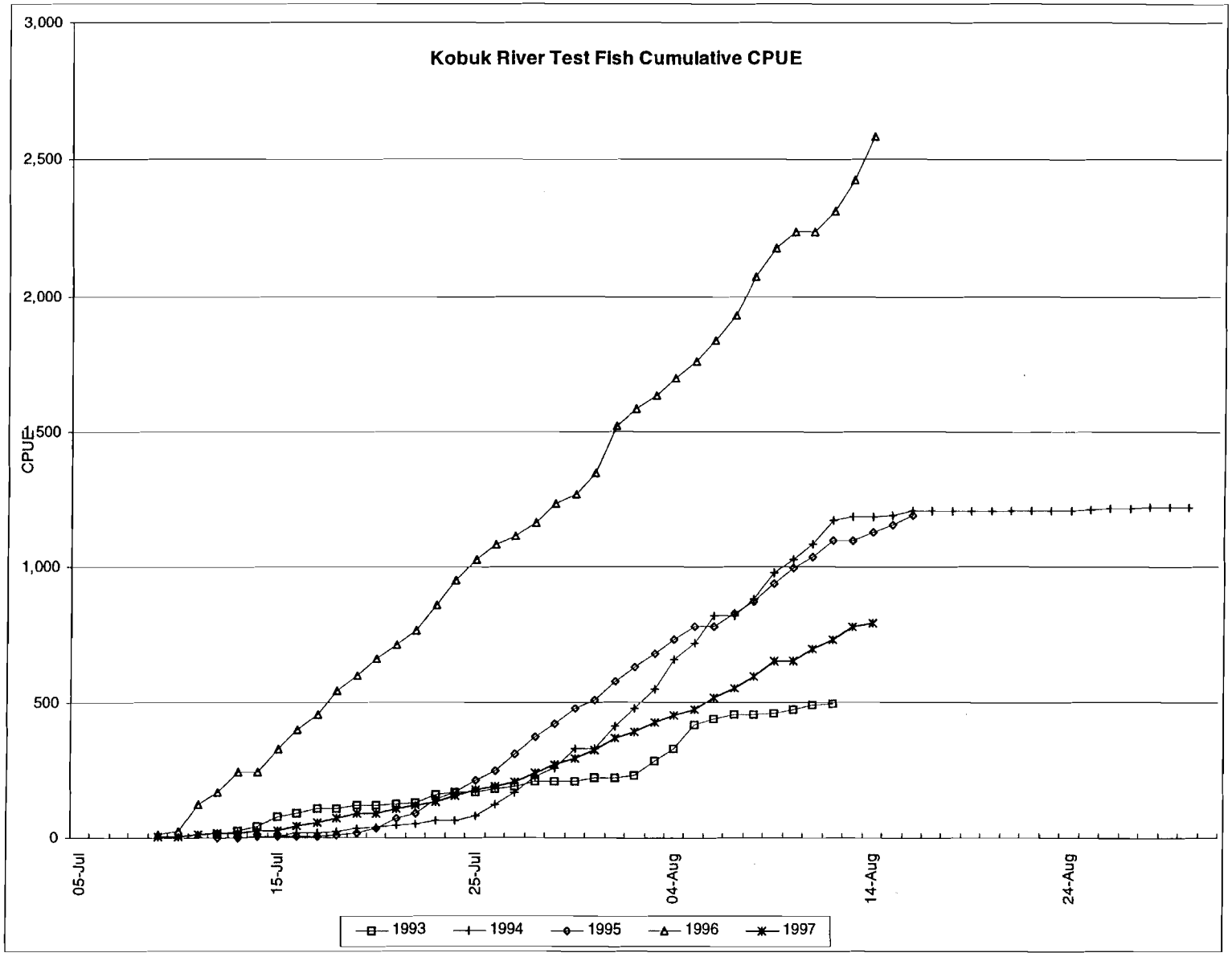


Figure 5. Kobuk River drift test fishing cumulative CPUE, 1993-1997.

Kotzebue District Historical Chum Salmon Aerial Surveys need to insert 1997

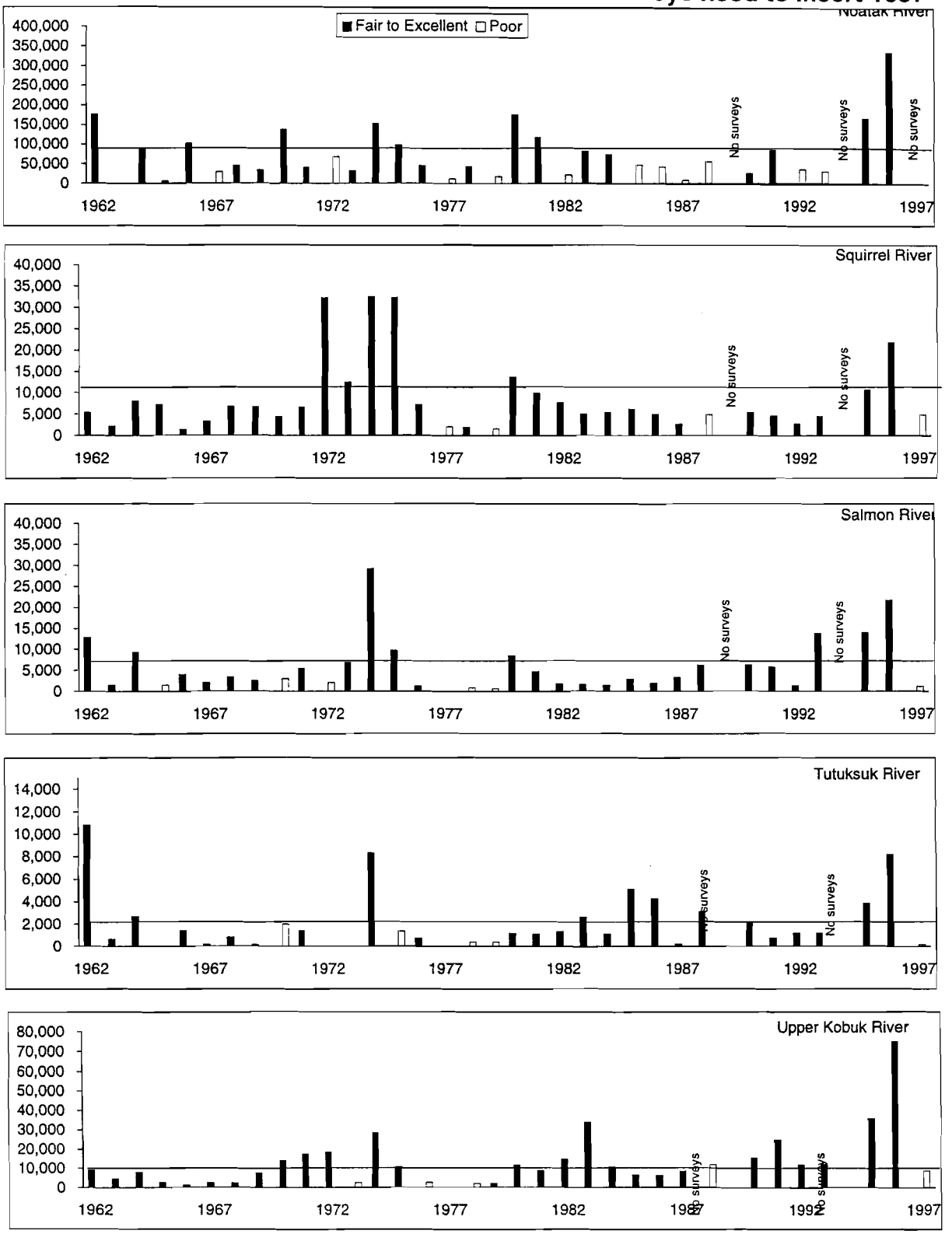


Figure 6. Kotzebue District peak aerial surveys of chum salmon in the Noatak, Squirrel, Salmon, Tutuksuk and Upper Kobuk Rivers. The horizontal line indicates the escapement goals for these rivers. These goals were established in the mid-1980's using limited information. No aerial surveys were conducted in 1989 or 1994 due to poor weather.