

1992
KOTZEBUE DISTRICT
FISHERIES REPORT
to the
Alaska Board of Fisheries

By
Tracy Lingnau
and
Charles Lean

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Alaska Department of Fish and Game
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KOTZEBUE DISTRICT FISHERIES, A REPORT TO THE BOARD

General Information

The Kotzebue District supports the northernmost commercial salmon fishery in Alaska. The recent commercial fishery began under state management in 1962. Salmon harvests consist primarily of chum salmon, although a few Dolly Varden are incidentally harvested in mid-August. There are 224 commercial permit holders, of which an average of 176 were active over the recent ten year period. Ninety-seven percent are residents of the district.

The commercial fishery became fully developed during the mid-1970s, since that time the fishery has displayed a cyclic pattern of harvest with alternating and declining strong and weak returns over four year intervals. In 1987, the Department began a rebuilding program with an emphasis on attaining escapement goals. Prior to 1987, the chum salmon exploitation rate was constant regardless of total return strength. Current fisheries management is based on a comparison as it compares to the historical age composition and catch rates at the same point in the season.

Inseason Management

Primary fishery management objectives are to provide adequate chum salmon escapement and meet subsistence harvest needs. Fishery management is based upon a comparison of period and cumulative inseason catch rates in prior years during the early part of the season and Noatak River sonar counts through the remainder of the season. During the first half of the season, the run is primarily bound for the Kobuk River, but by early August the Noatak River stocks predominate in the fishery. The commercial catch data was limited to 1979-1991 in order to account for increased fleet efficiency and to encompass the range of years when similar fishing schedules were in effect. This was the sonar's fourth year of operation; sonar counts from 1990 and 1991 were compared with the 1992 counts.

Meetings throughout the season were held with fishermen to distribute catch statistics and obtain input from local fishermen. Because there are no Departmental inseason run assessment indices on the Kobuk River, subsistence fishermen were called several times inseason to obtain subsistence catch information which provides a qualitative indication of the level of escapement. Alaska Department of Fish and Game personnel also made person to person contact with some Kobuk Delta and Kiana subsistence fishermen to ask them about their impressions of the run strength and timing.

Commercial harvest in the Kotzebue district (Figure 1) for 1992

were 289,184 chum salmon, 204 chinook salmon, and 1,977 Dolly Varden (Table 1). One hundred forty-nine permit holders fished in 1992. This catch was at the upper end of the preseason forecast of 200,000 to 300,000 and very near the recent 13 year (1979-1991) average of 308,000. This is the second lowest level of participation on record, just ahead of last year's 143 permits. Low salmon prices and higher than normal construction job opportunities in Kotzebue may have resulted in the reduced numbers of participating permit holders.

Gear is limited to set nets with a congregation of no more than 150 fathoms per fisherman. Most fishermen operated with one end on or near shore and with all three shackles (50 fathoms per shackle) connected. A few fishermen attempted to fish deeper channels in the mud flats further from shore. Most gear used in the district is 5-7/8 in (14.9 cm) stretch multifilament gill net.

Fourteen of the normal 15 openings were fished in 1992. This is the seventh year in the last 14 in which 15 openings were not fished. A total of 408 hours were fished in 1992. This is substantially less than the recent 13 year (1979-1991) average of 534 hours. The average number of hours for each period for 1992 was 29.1 compared to 35.6 for the recent 13 year average.

Commercial Season Summary

The Kotzebue Sound commercial salmon season was opened July 9 by emergency order as established by regulation. The catches for the first 4 periods were above or near the recent 13 year average (Table 2, Figure 2). With above average catch rates for the first 4 periods, the fifth period was extended to 36 hours in length.

The next 6 commercial openings were 36 hours in length. Catch rates for periods 5 through 10 were very erratic ranging from a lower than average catch rate for Period 6 (5.5 individual's catch per hour or CPUE) to more than twice the average for Period 9 (13.0). Even though there were fewer than normal permits fishing, commercial catches for the most part were near average.

Noatak River sonar daily counts during the first two weeks of August were very similar to 1990 when only about half of the escapement goal was met (Table 7; Figure 5). Because low sonar counts raised concerns about fishing time, Period 11 was reduced to 24 hours. During this time, sonar counts remained low and high water was anticipated due to rain; fish which were in the lower portion of Noatak were expected to retreat back into Kobuk Lake and Kotzebue Sound. With salmon counts remaining low and high water expected, Period 12 was pulled in order to boost salmon escapement into the Noatak. A fishery announcement was issued stating that escapement indices would be re-evaluated before reopening the district to commercial fishing.

The anticipated surge of high water did occur. At Kelly River, water rose 4 feet overnight. Noatak Sonar camp reported a rise of 5 feet of water and a decrease in water temperature. Salmon did back out into Kotzebue Sound. There were visual reports and subsistence catches in good numbers were reported in the Kotzebue boat harbor. Long time local residents had never seen anything like this before.

As the high water event passed, fish passage increased at the sonar site. It was decided that the last three commercial periods would be fished with 24 hour openings. The opening of the thirteenth period was delayed 14 hours (Friday morning at 0800 instead of Thursday night at 1800) for two reasons. The eruption of Mt. Spur curtailed airline traffic to and from Anchorage where fish are processed. The delay gave the airlines a chance to normalize flights. A delayed opening also allowed additional fish passage and escapement. Periods 14 and 15 are normally scheduled fishing periods on Monday and Thursday beginning at 1800. Commercial catches for the last three periods were at or near average levels with catch rates above normal.

Five year old chum salmon tended to dominate the earlier commercial openings with younger age classes moving through during the latter part of the fishery. There was a higher percent of 5 year old fish for the first 7 periods than average and they were more dominant than the four year old fish during the first three openings (Table 5, Figure 4a,4b). Age-5 fish contribution were near average for the rest of the season. Age-4 fish were near average for Periods 5-10 and 15. This age group had a higher percent than average for Periods 11, 13 and 14. This may be a reflection of the lack of three year old fish in the latter part of the run. There was an increase of age-3 fish in the last period and a subsequent decrease in age-4 fish. Historically, three year old fish have made up to a third of the catch with a 13 year average between 15-20 percent for periods 11-14.

Three buyers purchased a total of 2,397,302 pounds of chum salmon (average weight 8.3) at \$.22 per pound, 2,714 pounds of chinook salmon (average weight 13.3) at an average of \$1.89 per pound, and 11,951 pounds of Dolly Varden (average weight 6.0) at an average of \$.10 per pound (Table 3). The total exvessel value was \$533,731 for Kotzebue area fishermen with an average of \$3,582 for each participating permit holder. All buyers iced their fish and flew them to Anchorage for processing.

Dolly Varden were purchased near the end of the fishery when a small market was found. The first trout were sold during Period 10, however fishermen had been catching trout prior to that time.

Escapement

Aerial surveys of the lower Kobuk River tributaries (Squirrel, Salmon, and Tutuksuk) were flown on August 4. This would have been the first of three surveys during a normal year; however, due to poor weather conditions, it was the only survey. When compared to previous years, these tributaries had roughly half of the normal amount of salmon they should have. The Tutuksuk was the exception with more than half of the escapement goal (Table 3).

Poor survey conditions persisted for the Noatak River and Upper Kobuk. Surveys on September 8 and 9 were limited by high turbid or tannic stained water. A survey conducted 10 days later on the Noatak was also poor due to wind chop and ice flows creating shadows on the bottom of the river. Although both Noatak surveys produced similar numbers of salmon, 60 to 70 percent of the salmon seen on the second survey were probably new fish. Given the poor conditions, the sonar escapement of about 75,000 salmon is thought to be a better index than the aerial surveys.

The peak survey on the Upper Kobuk was very near the escapement objective although it was conducted under poor conditions. The second survey enumerated an estimated 8,500 salmon and was conducted with fair conditions. This survey was probably made after the peak of the run.

Dolly Varden

Incidental catch of Dolly Varden (locally called trout) for 1992 was one-third of the 1991 catch of 6,136. Spawners and wintering Dolly Varden normally migrate through the district during the third week of August. With Period 12 pulled and reduced fishing time for Periods 11 and 13-15, incidental catch of trout was reduced. When trout can not be sold, most are kept for subsistence purposes. The majority of the trout were taken from statistical areas 2 and 5 (Table 4, Figure 3).

Freshwater Fisheries

Limited commercial harvest of miscellaneous finfish has been allowed since statehood, normally under the direction 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 1992 commercial salmon season. Sheefish are caught and sold predominantly between late October and late March.

There were five freshwater permit holders in 1992, compared with 11 for 1991. Of these five, four were registered and three sold 289

sheefish fish weighing 2,850 pounds with an average price of 0.65 per pound (Table 6).

1993 Outlook

The outlook for the 1993 season is based on the returning age classes of the 1992 season. During the 1993 season the four year old age component of the run is expected to be well below average, but the five year old component is expected to be near normal, as is the three year old component. The 1993 commercial harvest is expected to fall within the range from 150,000 to 250,000 chum salmon.

Table 1. Commercial catches of chum salmon, chinook salmon, and Dolly Varden by period in the Kotzebue District, 1992.

Period	Dates	Hours	Number of Fishermen	Chum			Chinook			Dolly Varden		
				Number	Pounds	Avg. Wt.	Number	Pounds	Avg. Wt.	Number	Pounds	Avg. Wt.
1	7/09-7/10	24	38	5,605	48,607	8.7	14	174	12.4	0	0	
2	7/13-7/14	24	51	3,979	34,643	8.7	11	180	16.4	0	0	
3	7/16-7/17	24	85	5,857	52,142	8.9	21	294	14.0	0	0	
4	7/20-7/21	24	100	20,566	183,638	8.9	23	391	17.0	0	0	
5	7/23-7/24	36	111	27,342	236,979	8.7	27	370	13.7	0	0	
6	7/27-7/28	36	91	18,048	156,394	8.7	10	113	11.3	0	0	
7	7/30-7/31	36	114	53,356	464,804	8.7	20	320	16.0	0	0	
8	8/03-8/04	36	97	22,437	185,247	8.3	19	227	11.9	0	0	
9	8/06-8/07	36	108	50,664	410,090	8.1	25	241	9.6	0	0	
10	8/10-8/11	36	107	35,645	284,107	8.0	13	131	10.1	149	887	6.0
11	8/13-8/14	24	93	17,640	133,364	7.6	11	136	12.4	335	2,173	6.5
12	<i>Closed Period</i>											
13	8/21-8/22	24	75	15,160	112,778	7.4	1	9	9.0	891	4,842	5.4
14	8/24-8/25	24	75	9,672	71,029	7.3	6	80	13.3	530	3,564	6.7
15	8/27-8/28	24	54	3,213	23,480	7.3	3	48	16.0	72	485	6.7
Totals	7/09-8/28	408	149	289,184	2,397,302	8.3	204	2,714	13.3	1,977	11,951	6.0

Table 2. Kotzebue District 1992 commercial and 13 year average catch statistics (1979–1991).

13 Year Average					Cumulative		
Period	Hours	Number Permits	Catch (x 1,000)	CPUE	Catch (x 1,000)	CPUE	Prop. Catch
1	24	44	3.2	2.8	2.9	2.8	0.009
2	24	73	5.5	2.9	8.4	2.8	0.027
3	24	100	10.4	4.1	18.8	3.4	0.062
4	25	121	19.3	6.0	38.1	4.4	0.123
5	27	134	24.4	6.5	62.4	5.0	0.204
6	29	142	31.9	7.5	91.8	5.6	0.302
7	38	147	39.5	7.1	128.3	5.9	0.428
8	40	151	44.0	7.0	172.3	6.1	0.572
9	44	145	41.1	6.1	213.5	6.2	0.709
10	42	147	47.7	7.4	257.5	6.3	0.832
11	45	137	27.2	4.4	280.5	6.1	0.913
12	45	117	15.7	2.9	295.0	5.8	0.960
13	43	90	9.6	2.4	303.0	5.6	0.985
14	41	63	5.5	2.0	306.4	5.5	0.995
15	43	37	2.7	1.7	307.9	5.4	1.000

Year: 1992					Cumulative		
Period	Hours	Number Permits	Catch (x 1,000)	CPUE	Catch (x 1,000)	CPUE	Prop. Catch
1	24	38	5.6	6.1	5.6	6.1	0.019
2	24	51	4.0	3.3	9.6	4.5	0.033
3	24	85	5.9	2.9	15.4	3.7	0.053
4	24	100	20.6	8.6	36.0	5.5	0.125
5	36	111	27.3	6.8	63.4	6.0	0.219
6	36	91	18.0	5.5	81.4	5.9	0.282
7	36	114	53.4	13.0	134.8	7.5	0.466
8	36	97	22.4	6.4	157.2	7.3	0.544
9	36	108	50.7	13.0	207.9	8.2	0.719
10	36	107	35.6	9.3	243.5	8.3	0.842
11	24	93	17.6	7.9	261.2	8.3	0.903
12	Closed Period				261.2	8.3	0.903
13	24	75	15.2	8.4	276.3	8.3	0.955
14	24	75	9.7	5.4	286.0	8.2	0.989
15	24	54	3.2	2.5	289.2	8.0	1.000

Table 3. Kotzebue District chum salmon fishery information, 1981 - 1992.

Commercial Catch	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
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
Number of permits	187	199	189	181	189	187	160	193	165	153	143	149
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
Est. value (in thousands)	\$3,247	\$1,962	\$421	\$1,149	\$2,137	\$933	\$515	\$2,605	\$614	\$438	\$429	\$527
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
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
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
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
Tutuksuk	1,114	1,322	2,637	1,132	5,100	4,257	206 ^c	3,122		2,275 ^c	744	1,162
Total	130,838	46,239	123,035	86,497	63,787	54,502	20,022	72,003		52,390	116,590	50,542
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 in 1989 due to unfavorable weather and water conditions.

^c Poor aerial survey conditions.

^d Foot surveys.

Table 4. Commercial chum salmon, chinook salmon, and Dolly Varden catch by statistical area in the Kotzebue District, 1992.

Statistical Area	Number of Fishermen	Chum			Chinook			Dolly Varden		
		Number	Pounds	Avg. Wt.	Number	Pounds	Avg. Wt.	Number	Pounds	Avg. Wt.
331-01	133	133,917	1,102,612	8.2	45	547	12.2	492	3,082	6.3
331-02	58	29,190	233,518	8.0	60	738	12.3	1,117	6,385	5.7
331-03	21	4,456	34,719	7.8	1	24	24.0	62	418	6.7
331-04	56	46,993	392,788	8.4	14	188	13.4	22	127	5.8
331-05	26	10,197	84,409	8.3	14	176	12.6	200	1,326	6.6
331-06	55	64,434	549,256	8.5	70	1,041	14.9	84	613	7.3
Totals	149	289,187	2,397,302	8.3	204	2,714	13.3	1,977	11,951	6.0

Table 5. Kotzebue District commercial age and sex composition of chum salmon, 1962–1992.^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
13 Year Average (1979–1991)		48.6	51.4	5.6	60.1	32.2	2.1
1992 ^l	3,706	39.6	60.4	0.9	58.5	37.5	3.1

^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.

Table 6. Kotzebue District winter commercial Sheefish harvest statistics, 1967–1992. ^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	^e	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 ^g	3	289	2,850	9.9	\$0.65	\$1,853

^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.

^g Preliminary Data

Table 7. Noatak River Sonar daily and cumulative chum salmon counts, 1990–1992.

Date	1990		1991		1992	
	Daily	Cum.	Daily	Cum.	Daily	Cum.
10-Jul			412	412		
11-Jul			275	687		
12-Jul			264	951		
13-Jul			289	1,239		
14-Jul			490	1,729		
15-Jul			785	2,514		
16-Jul			683	3,198		
17-Jul			133	3,330		
18-Jul			118	3,448		
19-Jul			82	3,531		
20-Jul	439	439	176	3,707		
21-Jul	861	1,301	170	3,876		
22-Jul	587	1,887	231	4,107		
23-Jul	509	2,396	292	4,399		
24-Jul	980	3,376	246	4,645		
25-Jul	615	3,991	543	5,188		
26-Jul	602	4,593	570	5,758		
27-Jul	587	5,180	850	6,608	1,795	1,795
28-Jul	2,469	7,649	707	7,314	860	2,655
29-Jul	1,432	9,081	1,038	8,353	253	2,908
30-Jul	756	9,837	1,419	9,772	355	3,263
31-Jul	1,174	11,011	678	10,450	351	3,614
01-Aug	626	11,637	1,292	11,742	710	4,324
02-Aug	390	12,027	1,464	13,205	1,482	5,806
03-Aug	647	12,674	1,917	15,123	485	6,291
04-Aug	445	13,119	5,009	20,132	282	6,573
05-Aug	941	14,060	2,746	22,878	1,499	8,072
06-Aug	1,076	15,135	2,087	24,966	1,835	9,907
07-Aug	1,903	17,039	2,002	26,968	1,161	11,068
08-Aug	1,366	18,404	1,563	28,531	3,837	14,905
09-Aug	1,594	19,998	890	29,420	1,305	16,210
10-Aug	2,086	22,084	744	30,164	1,205	17,415
11-Aug	1,983	24,067	1,839	32,003	3,142	20,557
12-Aug	2,067	26,134	2,346	34,350	1,474	22,031
13-Aug	2,343	28,477	2,837	37,187	1,763	23,794
14-Aug	1,982	30,460	6,264	43,451	548	24,342
15-Aug	757	31,217	7,087	50,537	1,475	25,817
16-Aug	810	32,026	5,963	56,500	4,667	30,484
17-Aug	1,626	33,653	2,852	59,352	4,986	35,470
18-Aug	1,770	35,422	2,237	61,589	2,804	38,274
19-Aug	1,270	36,692	2,291	63,879	3,652	41,926
20-Aug	886	37,578	3,068	66,948	4,873	46,799
21-Aug	468	38,046	1,928	68,876	4,444	51,243
22-Aug	635	38,681	2,215	71,091	1,429	52,672
23-Aug	644	39,325	1,933	73,025	1,080	53,752
24-Aug	535	39,860	1,410	74,435	2,561	56,313
25-Aug	993	40,853	1,320	75,755	2,204	58,517
26-Aug	1,078	41,931	1,464	77,219	3,724	62,241
27-Aug			1,747	78,966	5,077	67,318
28-Aug			1,385	80,351	1,428	68,746
29-Aug			1,147	81,498	1,319	70,065
30-Aug			1,241	82,739		

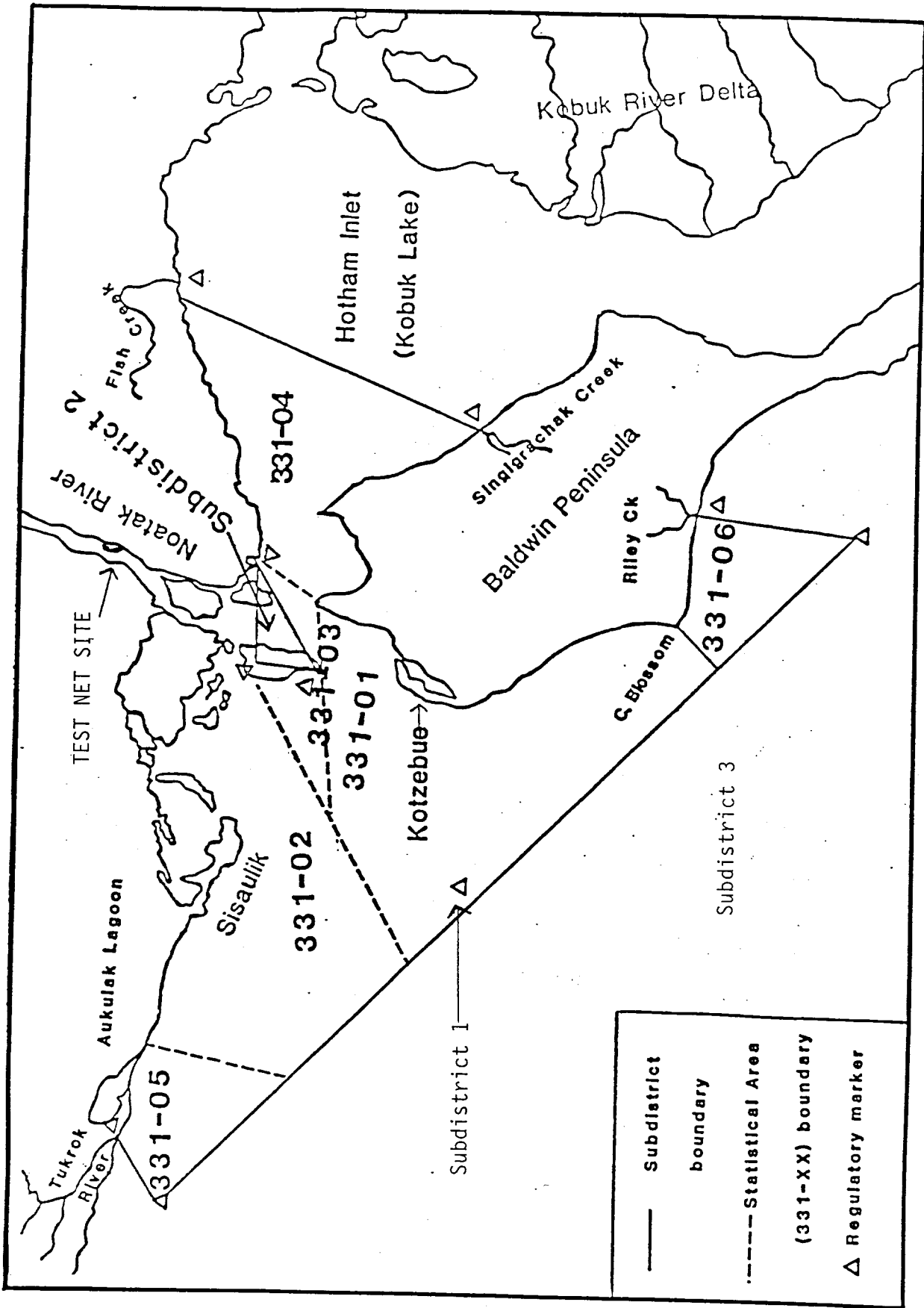


Figure 1: Kotzebue Sound commercial fishing subdistricts and statistical areas.

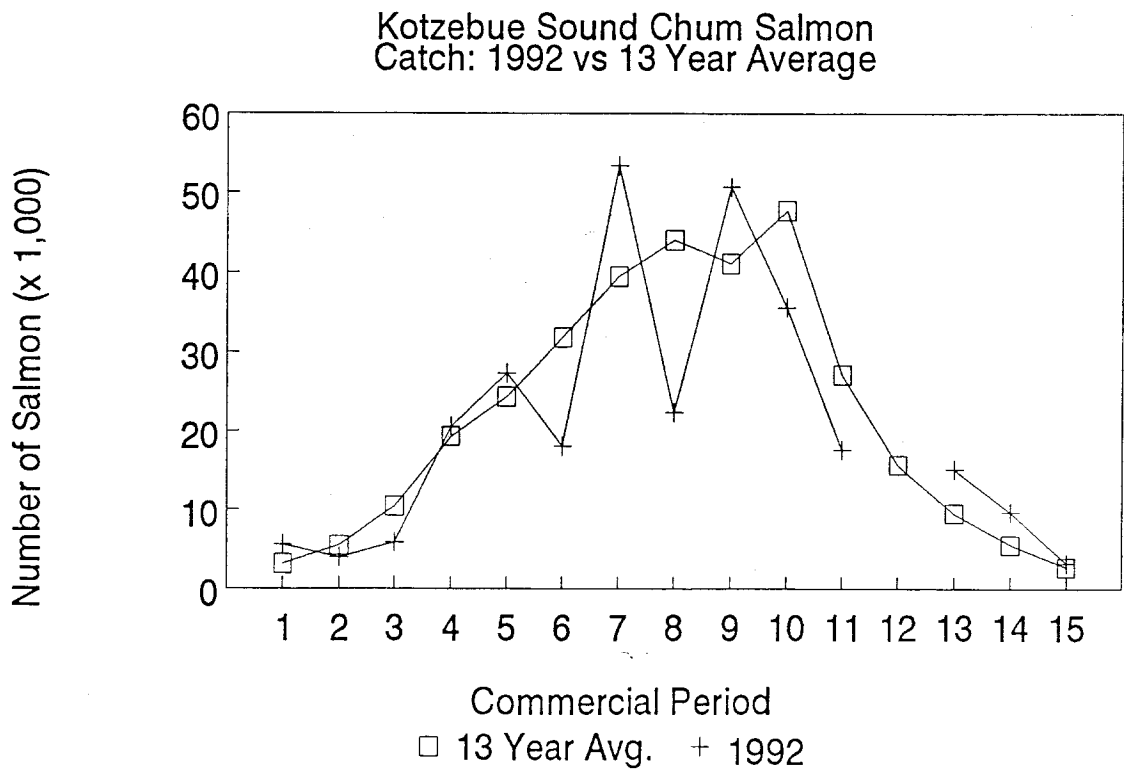
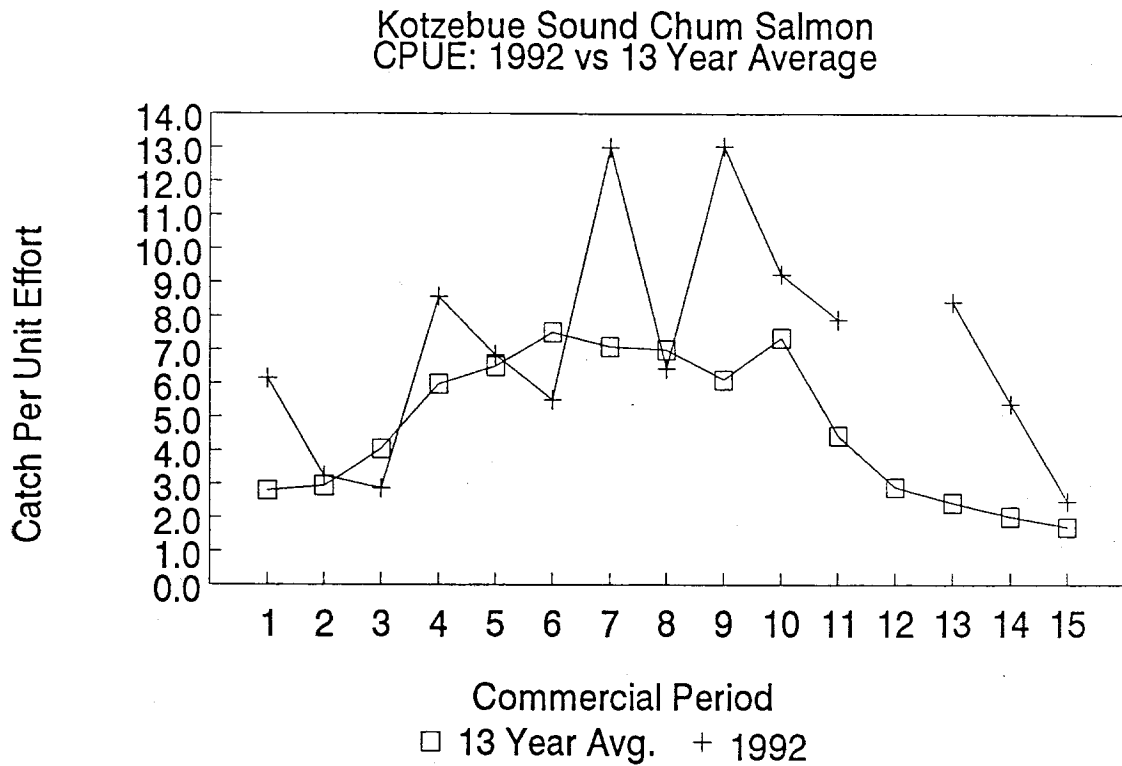


Figure 2. Kotzebue District commercial previous 13 year average (1979–1991) and 1992 catch and catch per unit effort comparisons.

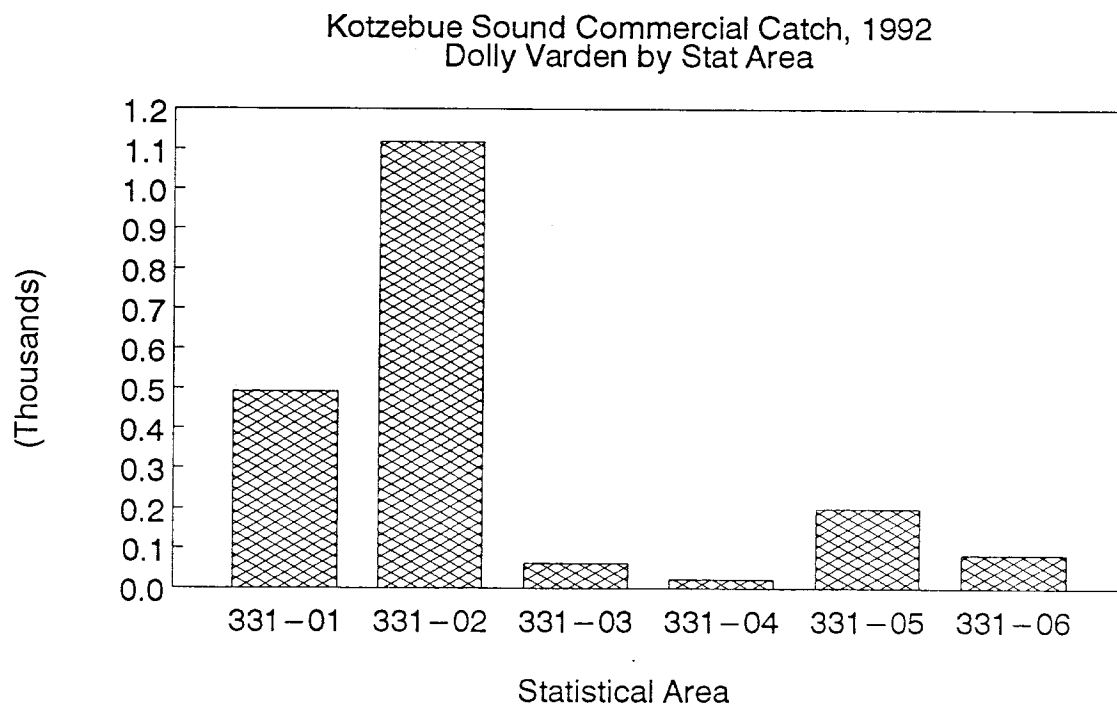
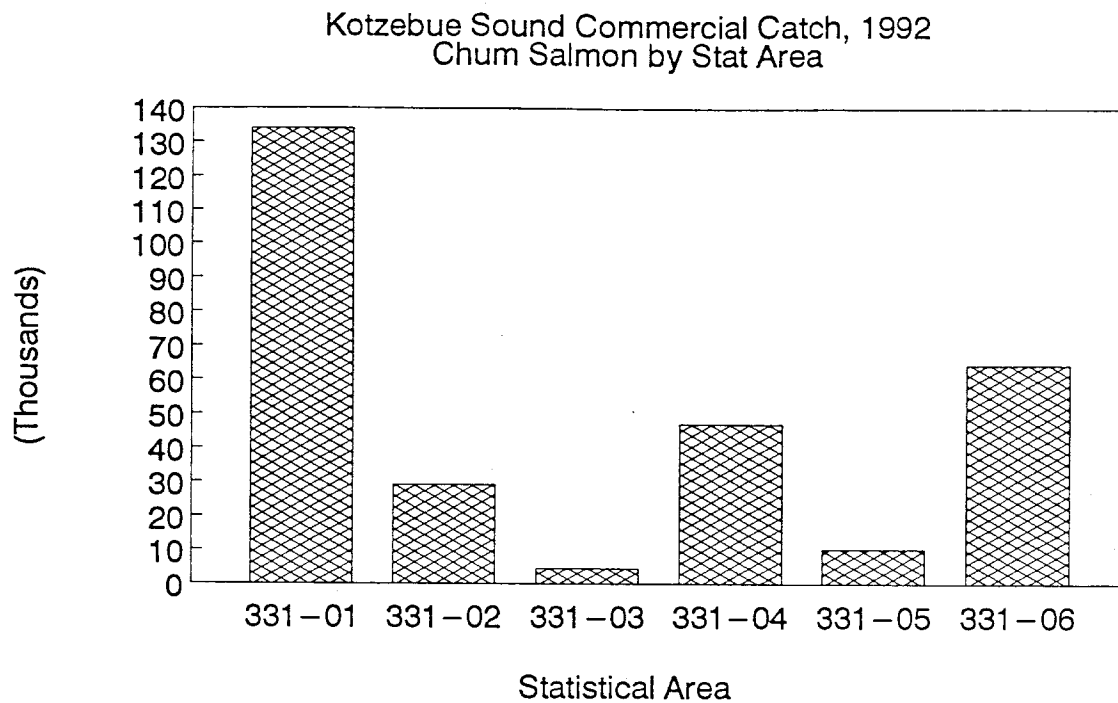


Figure 3. Kotzebue District chum salmon and Dolly Varden catch by statistical area.

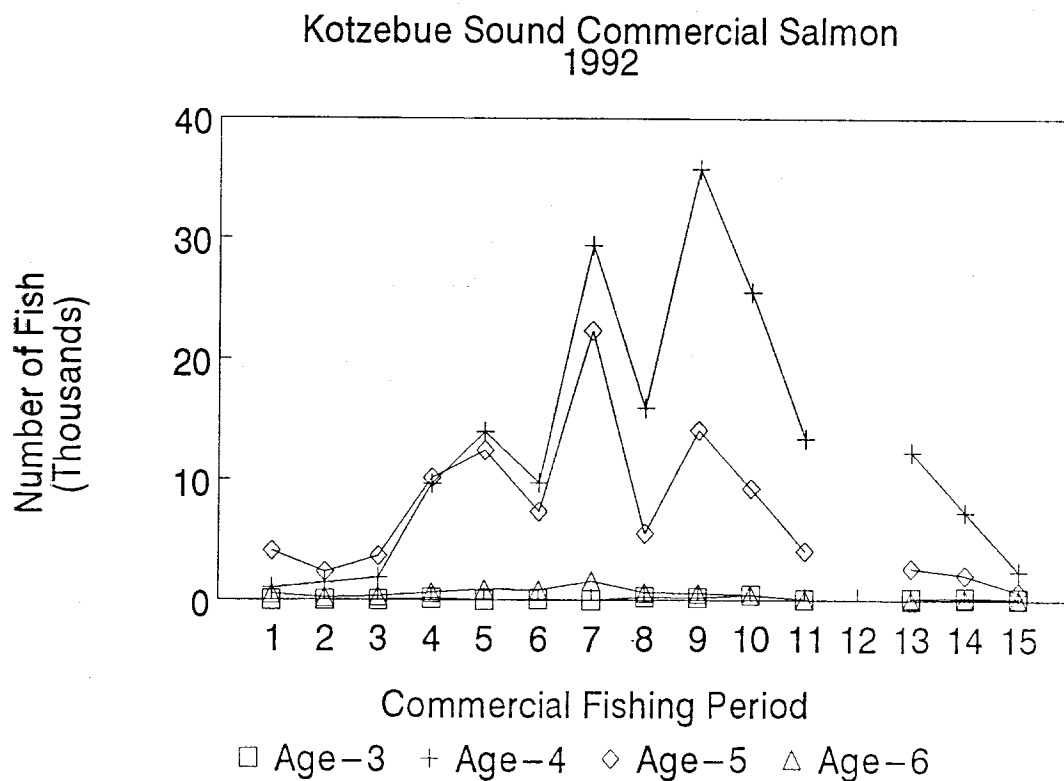
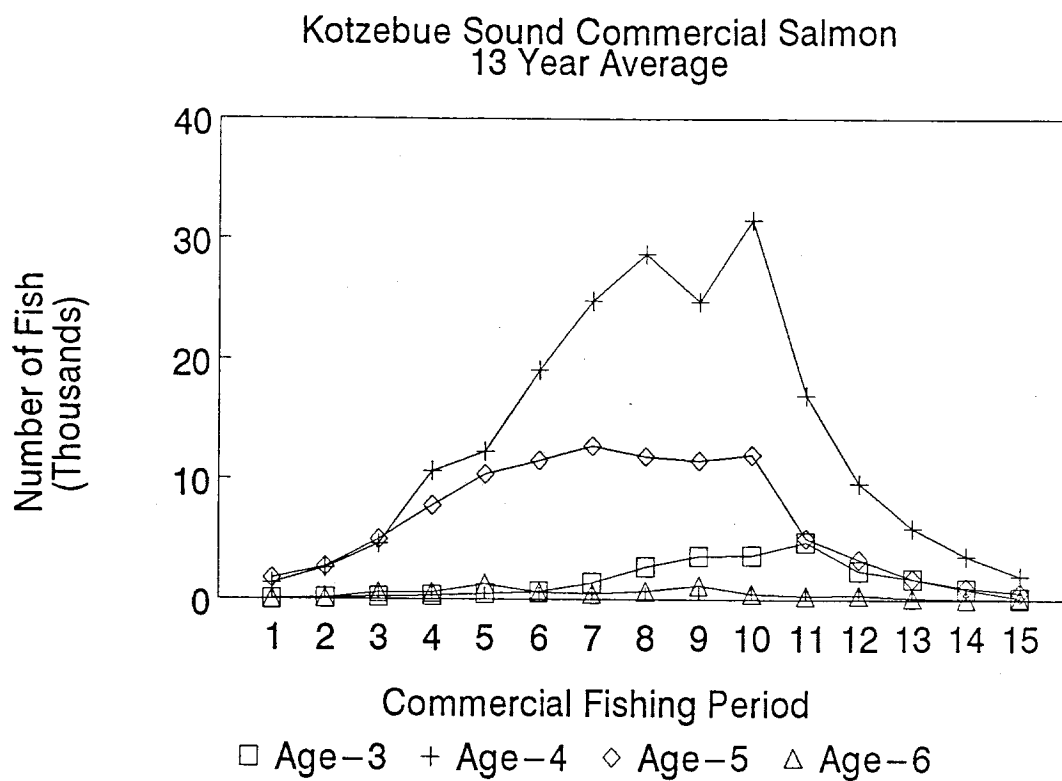


Figure 4A. Age in numbers of chum salmon by period comparing recent 13 year average (1979 – 1991) to 1992.

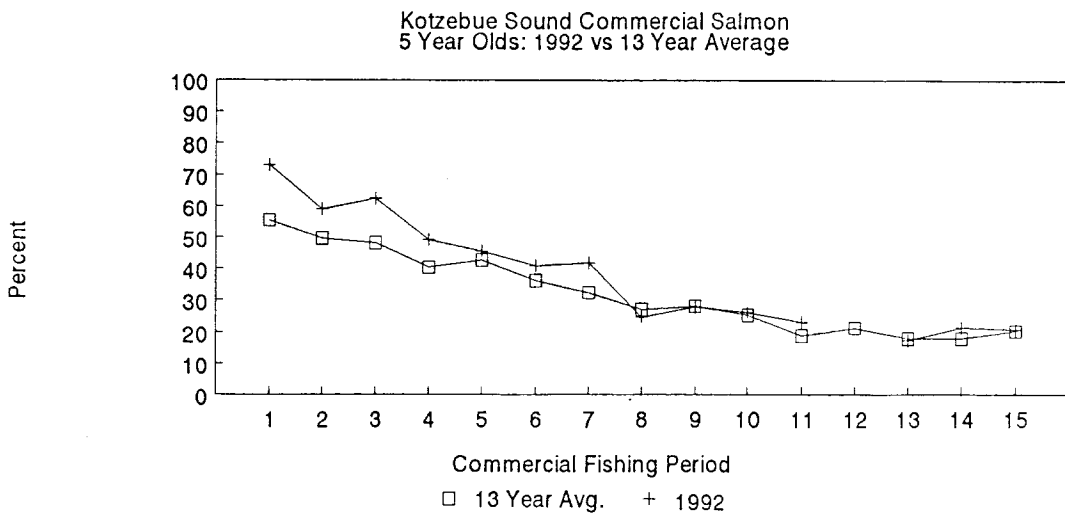
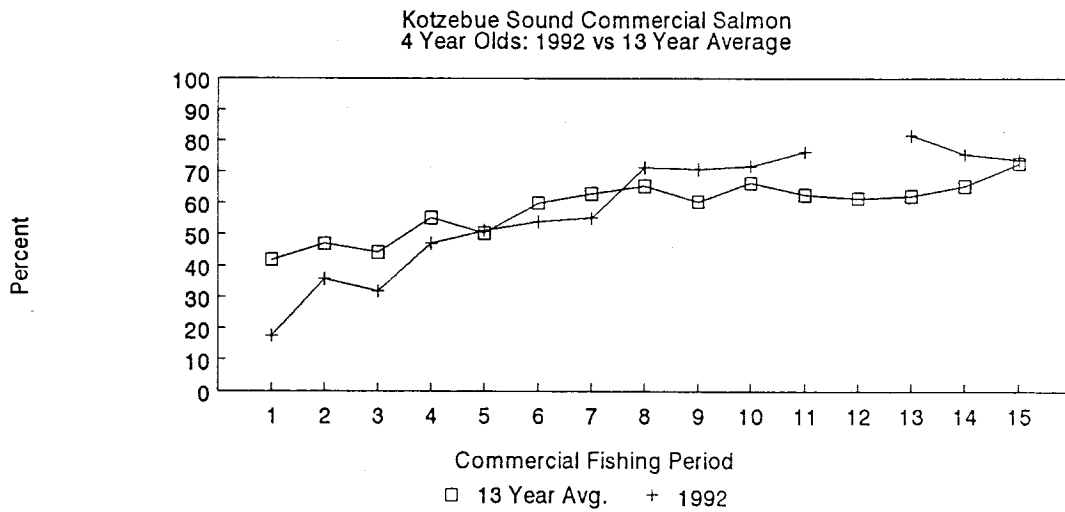
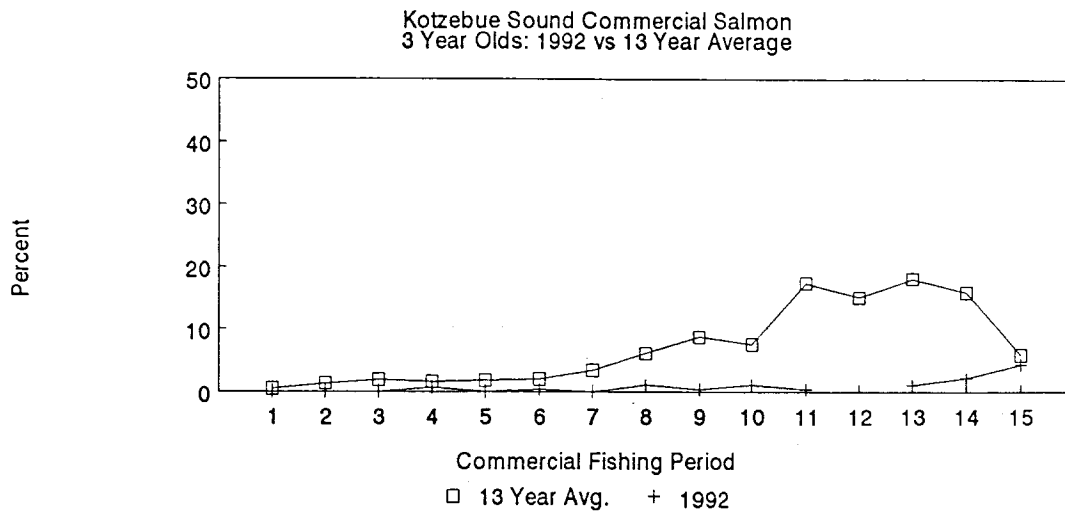


Figure 4B. Age composition of chum salmon by period comparing recent 13 year average (1979–1991) to 1992.

Noatak River Sonar Chum Salmon Passage

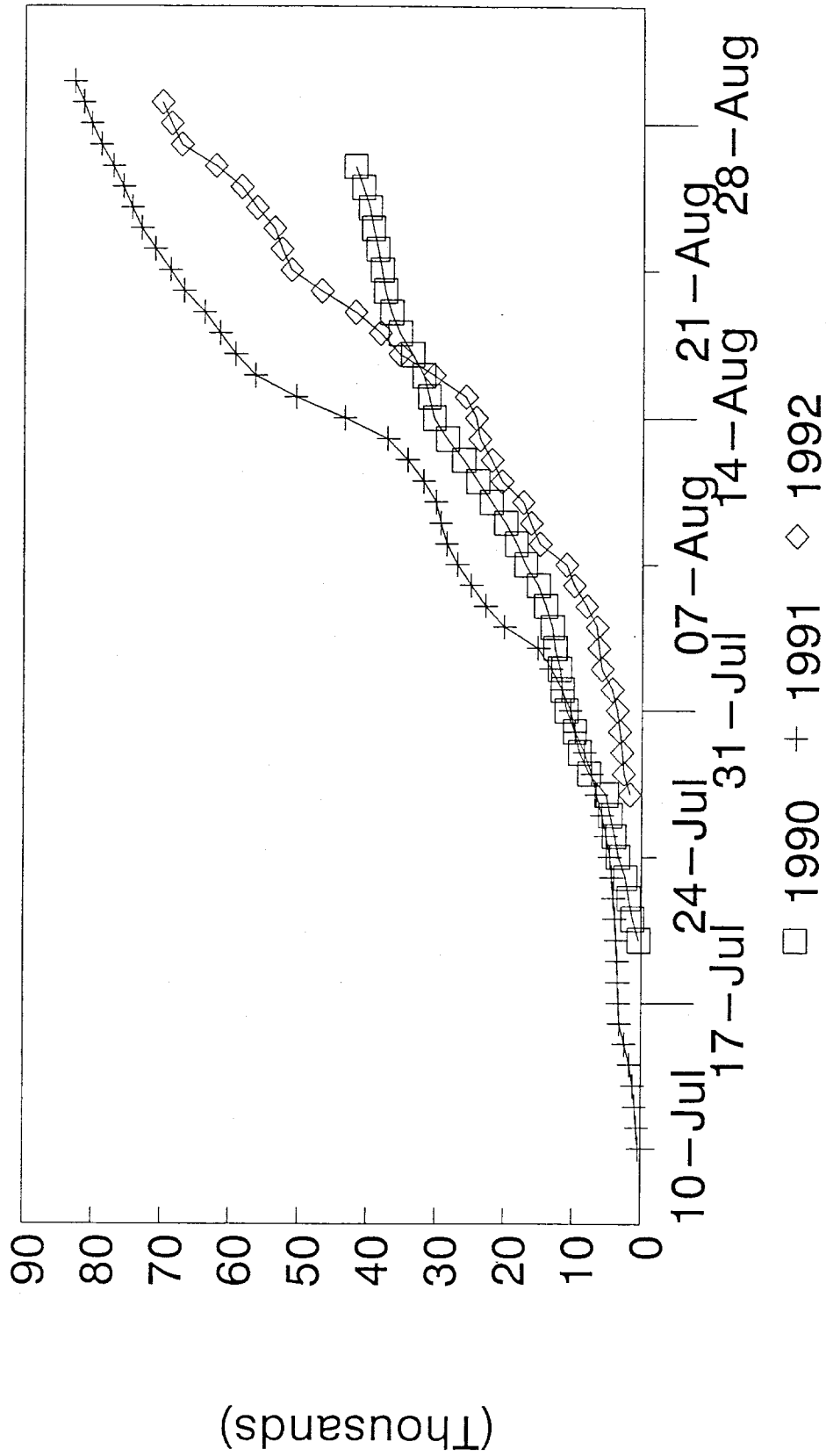


Figure 5. Noatak River Sonar daily and cumulative chum salmon counts, 1990–1992.