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Kobuk River Test Fishing Project, 1997

By

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INTRODUCTION

The Kobuk River originates on the south side of the Brooks Range in the Arrigetch Mountains inside the Gates of the Arctic National Park. The river flows roughly 500 river miles west where it terminates at Kobuk Lake. The lower two-thirds of the river is stained by tannin primarily from the Pah River, an upper river tributary. Five villages are located on the Kobuk River and all depend on chum salmon for subsistence use. Residents of Kotzebue also depend on Kobuk River chum salmon as a subsistence resource. The Kobuk River is also thought to support up to 60% of the commercial catch of chum salmon in the Kotzebue District.

This was the fifth consecutive year a drift gillnet test fishing project operated in the lower Kobuk River (Lingnau, 1993; Lingnau, 1994; Lingnau, 1995; Lingnau 1996). Because of the Kobuk River's tannic stain, test fishing is less susceptible to net avoidance by salmon than clear water systems. The only previous salmon project in the Kobuk River drainage was a counting tower site on the Squirrel River, which was too distant to provide timely information for fisheries management. This report presents the results of the fifth year of the Kobuk River drift test fishing project.

Management of the Kotzebue District commercial salmon fishery, particularly during the month of July, is dependent primarily on comparing commercial fishing period and cumulative season catch statistics to those of prior years. Because of the change in market demand in recent years, these comparisons are no longer reliable. The drift test fishing project was initiated because of the need for an inseason index of run timing and abundance for Kobuk River chum salmon stocks, which largely support the first portion of the salmon migration into the Kotzebue District. While test fishing is a relatively low cost approach, it can also be susceptible to inter-annual variability in catch rates which typically requires the data be interpreted in a somewhat qualitative way as an abundance index if calibration is not possible between years. The objectives of the test fishing project for 1997 were:

1. To evaluate chum salmon abundance migrating into the Kobuk River drainage using a comparison of systematic drift gill net catches.
2. To assess, in a qualitative way, the impact of the Kotzebue District commercial salmon fishery on chum salmon abundance in the lower Kobuk River for fisheries management purposes.
3. Describe the migratory timing for chum salmon in the lower Kobuk River.
4. Sample for age, sex and length.

METHODS

Site Description

The site is approximately 70 river miles from the eastern boundary of the commercial salmon fishing district (Figure 1). This is the furthest downstream site where the river runs through a

single channel and is below all spawning tributaries which support spawning chum salmon. The test fishing site was also selected because of it's desirable stream characteristics. The site consists of roughly a 1 mile river section located approximately 3 miles downstream from Kiana. The width of the river was approximately 300 meters and was divided into two sites (Figure 2). Site N is the north side of the river (right bank), which is the cut bank side of the river with the swiftest current. Site S is located on the south side of the river (left bank). Site S is located downstream from a major sandbar and has a gradual gradient. It is also the site with the slowest current. A bottom profile at the test fish site this year revealed a near uniform bottom with a maximum depth of 6 meters. The deepest portion of the river was in the first quartile from the right bank (Figure 3).

Test Fishing

Fishing was scheduled to sample salmon passage during three different segments of the day at each of the two sites; morning (0800), mid-day (1500), and late evening (2200). Drifts were conducted by a two person crew, six days per week. During the peak of the run, drifts were conducted every day of the week.

All test fishing drifts were made from a 20 foot open outboard motorboat for no more than 20 minutes with a 50 fathom gill net. If catch rates were high, fishing time was reduced in order to control mortality. The net was composed of 6 inch (15.2 cm) stretched mesh multifilament webbing, 40 meshes deep, and hung at a ratio of 2:1. Age-sex-length data were collected from up to 80 chum salmon per day. Mortalities were primarily given to elders but some were given to other individuals for subsistence purposes. The availability of chum salmon was announced over the CB radio.

Standardized Catches

Actual catches were converted to catch per unit of effort (CPUE) by considering fishing time and the length of net used. Each CPUE index was the number of fish which would have been caught if 100 fathoms of net had been fished for 60 minutes. The index (I) was calculated as follows:

$$I = \frac{6{,}000\,(c)}{(l)\,(t)}$$

Where: c = number of chum salmon caught
l = length of net in fathoms
t = mean fishing time in minutes

Mean fishing time (t) was defined as the amount of time the entire net was fishing plus half the time it took to deploy and retrieve the net. Mean daily drift CPUE indices were calculated using the sum of the total time fished and total fish caught for each day. The mean daily indices were summed to produce total seasonal CPUE indices for the period of data collection. Cumulative proportions of seasonal total test fish CPUE indices were also calculated.

Catch rate for each time period and site was determined by using the fishing time and number of fish caught for those specific time periods and sites. Seasonal abundance by site and time period were indexed by summing CPUE indices for each of the daily sites and time periods. Temporal distribution was depicted as a percent calculated by dividing each time period total by the total CPUE indices. Spatial distribution was described as a percent by dividing each site's CPUE seasonal total by the total of both site's CPUE indices. Temporal and spatial distribution are described as a percent since the number of drifts made at each site and the amount of time fished varied.

RESULTS

Drifting began on July 9 and continued through August 14. CPUE indices were calculated for each drift and site (Table 1). There were 818 chum salmon caught in a total of 202 drifts (101 drift time periods) producing 2,382 chum salmon drift period CPUE index points (Table 6). The peak catch and CPUE occurred on August 9 with a catch of 51 salmon, which was a daily CPUE of 55.14 (5.7% of the seasonal CPUE index). Totals of 33.1, 33.2 and 33.7 percent of the seasonal CPUE indices were caught at 0800, 1500, and 2200 hours (Table 4). Totals of 27.3 and 72.7 percent of the total seasonal CPUE indices were caught at sites N and S, identical to 1996. Proportions of passage were identical for all three time periods for 1997 (non-statistical comparison, nsc) (Table 5). The mean secchi for 1997 was 3.8 meters. This is the clearest water observed since the beginning of the project and near the average secchi reading of 1995 (3.5).

There were 756 aged chum salmon scales from test net samples. Enough scale samples were taken to stratify age and sex composition by week (Table 7). The age composition was 1.3% age-0.2, 23.9% age-0.3, 59.3% age-0.4, 15.2% age-0.5 and 0.3% age-0.6 (Table 8). The age composition of the 1997 Kotzebue commercial and Noatak River drift test fish catch is shown for comparison in Table 8. Length by age comparison (nsc) indicates that males from the Kotzebue commercial catch were larger than the Kobuk River and Noatak River test fishing samples. Females from the Noatak River sample were larger than the other two sample sources. Chum salmon samples were caught with similar gear. Samples from the Kobuk and Noatak Rivers were from 6 inch mesh gillnet catches while commercial gear is 5-7/8 or 6 inch mesh gillnet.

The test fishing methods for the Kobuk River project were the same as they had been in the prior four years. The test fishing gear was intended to match the gear typically used in the commercial fishery. Three days of test fishing were missed due to regular days off. Only one drift was missed due to a mechanical problem. Seasonal test fishing data for 1993-1997 are presented in Tables 2, 3, 5 and 6, and in Figures 4 through 6. Figure 4 shows test fishing CPUE by day for 1993-1997. Figures 5 and 6 compare historical cumulative CPUE and cumulative proportions of CPUE indices. Climatological data are presented in Table 9 and Figure 7.

The test fishing CPUE indices generated (number of salmon caught) can be influenced considerably by normal commercial fishing activity in Kotzebue Sound, as well as the number of drifts conducted and their timing compared to commercial periods. In addition, local salmon migration patterns can be greatly influenced by weather conditions. For these reasons, no interpolations were

made for missing data points since the accuracy of these estimates may not be reliable.

CONCLUSIONS

The Kobuk River test fishing project was successful in it's fifth year of operation. Water clarity and level this year were relatively clear and low up until the final week of operation. However, tannic staining of the river prevented the salmon net avoidance that might have been expected during periods of low water, and contributed to stable catch efficiency throughout the season. The tannic stain provides concealment of the gillnets so that the ability to catch fish throughout the run remains relatively constant. This allows comparability within years and between years.

This year's chum salmon passage by time of day was nearly identical among the three daily sampling times. When looking at the historical catch information, in most years, there has been very little difference in salmon passage during different times of the day. Just as consistent is the catch rate by site. In all but one year, roughly seventy percent of the salmon CPUE occurred on the south side of the channel. The one year that was different (1994), was a 50 year flood event.

This year's peak did not occur until the last week of the project. Subsistence catches were some of the earliest in recent memory. When looking at this information, the salmon run into the Kobuk River was not only early to start, but very drawn out with a very slow but steady pace. The steady catch in the commercial fishery also supports this assessment. The migration of sheefish into the Kobuk River and Dolly Varden into the Noatak River were both somewhat extended as well.

Because of the near daily commercial openings, there were no pronounced fluctuations in the test fishery data with which to evaluate the time of the migration from the commercial fishery to the test fishing site. Previous information from local residents and the department indicate that the migration time is 5 to 6 days. Local subsistence fishermen were interviewed throughout the season by the test fishing crew. Catch rates from the test fishery seemed to track with subsistence catches throughout the season. The test fishing crew occasionally had problems giving fish away as the season progressed. The test fishery is most likely catching mixed stocks fish. Kiana residents are thought to harvest predominantly Squirrel River stocks. With the Kobuk River test fishing project providing fish to the community, pressure of subsistence harvests on Squirrel River stocks is most likely reduced.

The project was run as long as the budget would allow. It's six week duration is believed to have covered most of the migration. However, subsistence catches at the onset of test fishing and stable test fishing catches at the end of the project indicated portions of the run were missed. Test fishing on the Kobuk River at the current drift gillnet site near Kiana is feasible and provides management usable escapement indexing information in a cost effective manner. This project was used this year, and will be used in the future, as a management tool, to monitor escapements into the Kobuk River.

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Table 1. Kobuk River drift test fish chum salmon CPUE by day, drift and site, 1997. [a]

Date		CPUE by Drift [b]			CPUE by Site [c]		Daily	Cum..
		#1	#2	#3	N	S	CPUE	CPUE
9-Jul			0.00	10.67	0.00	10.32	5.85	5.85
10-Jul		0.00	0.00	0.00	0.00	0.00	0.00	5.85
11-Jul		0.00	5.27	10.79	0.00	10.43	5.31	11.16
12-Jul		0.00	16.00	5.33	0.00	14.33	7.19	18.35
13-Jul	[d]							18.35
14-Jul		0.00	7.91	10.79	1.79	10.67	6.25	24.60
15-Jul		2.76	8.18	0.00	0.00	7.16	3.65	28.25
16-Jul		10.67	11.03	20.87	1.83	26.09	14.28	42.53
17-Jul		21.33	8.28	15.65	0.00	28.73	15.17	57.70
18-Jul		16.00	10.91	21.33	1.86	29.35	16.12	73.82
19-Jul		8.09	18.67	27.27	10.91	24.89	17.98	91.80
20-Jul	[d]							91.80
21-Jul		11.03	34.29	8.28	1.85	33.80	18.53	110.33
22-Jul		8.09	0.00	31.30	10.51	16.12	13.28	123.61
23-Jul		18.46	10.79	2.76	5.45	16.00	10.79	134.40
24-Jul		16.36	20.09	30.97	16.12	29.35	22.86	157.26
25-Jul		13.79	24.27	26.37	3.72	38.26	21.57	178.83
26-Jul		21.82	11.03	11.03	5.63	23.28	14.66	193.49
27-Jul		26.37	15.82	13.19	10.91	25.53	18.46	211.95
28-Jul		29.33	28.09	33.94	38.66	21.49	30.53	242.48
29-Jul		34.29	33.55	16.18	14.44	41.14	28.13	270.61
30-Jul		13.33	21.33	33.00	12.54	38.52	22.33	292.94
31-Jul		24.55	30.00	42.50	21.33	43.03	32.57	325.51
1-Aug		55.61	32.00	37.59	31.22	50.91	41.41	366.92
2-Aug		20.87	28.42	18.88	20.31	24.57	22.41	389.33
3-Aug		33.88	36.28	35.45	13.33	55.94	35.21	424.54
4-Aug		29.63	31.43	19.31	10.00	41.82	26.67	451.21
5-Aug		23.01	30.64	19.09	14.22	36.00	24.47	475.68
6-Aug		41.86	39.59	45.71	21.98	61.76	42.25	517.93
7-Aug		35.12	34.74	38.05	4.00	68.00	36.00	553.93
8-Aug		69.40	49.87	11.43	19.79	66.21	45.07	599.00
9-Aug		45.47	37.18	94.29	40.71	69.82	55.14	654.14
10-Aug	[d]							654.14
11-Aug		43.64	32.73	56.00	29.69	58.11	43.75	697.89
12-Aug		36.67	54.00	16.00	36.57	38.13	37.36	735.25
13-Aug		41.14	55.38	39.34	23.53	67.29	45.93	781.18
14-Aug		35.20	12.97	0.00	8.81	22.80	16.01	797.19

[a] Catch per unit effort is calculated in catch/100fm/hour

[b] Drift 1 begins at 0800, Drift 2 at 1500, Drift 3 at 2200.

[c] Site N is the North Bank (right bank), Site S is the South Bank (left bank).

[d] Regular Day Off

Table 2. Kobuk River chum salmon drift test fish mean daily and cumulative CPUE, 1993-1997.

	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	a	18.35
14-Jul	20.57	45.97	2.68	2.68	2.80	3.73	a	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	a	6.50	71.35	401.08	14.28	42.53
17-Jul	17.27	111.51	a	16.61	0.00	6.50	55.49	456.57	15.17	57.70
18-Jul	a	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	a	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	a	67.17	28.46	173.26	91.89	951.21	22.86	157.26
25-Jul	a	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	a	330.52	29.89	508.86	82.27	1,350.23 *	32.57	325.51
01-Aug	a	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	a	781.83	80.47	1,835.35	42.25	517.93
07-Aug	20.52	457.86	a	820.87	46.39	828.22	90.99	1,926.34	36.00	553.93
08-Aug	a	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	a	654.14
11-Aug	18.11	490.44	57.02	1,083.33	37.95	1,034.74	a	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	a	1,098.66	114.63	2,423.26	45.93	781.18
14-Aug			a	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			a	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] Regular day off.
The "*" indicate the first and third quartiles and "+" indicates the mid-way point.

Table 3. Kobuk River chum salmon drift test fish mean daily and cumulative CPUE proportoins, 1993-1997.

	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							0.005	0.005	0.007	0.007
10-Jul							0.006	0.011	0.000	0.007
11-Jul							0.038	0.049	0.007	0.014
12-Jul	0.023	0.023			0.000	0.000	0.018	0.067	0.009	0.023
13-Jul	0.029	0.051	0.000	0.000	0.001	0.001	0.029	0.095	[a]	0.023
14-Jul	0.042	0.093	0.002	0.002	0.002	0.003	[a]	0.095	0.008	0.031
15-Jul	0.071	0.164	0.002	0.004	0.002	0.005	0.032	0.128	0.005	0.035
16-Jul	0.027	0.191	0.009	0.014	[a]	0.005	0.028	0.155	0.018	0.053
17-Jul	0.035	0.226	[a]	0.014	0.000	0.005	0.021	0.177	0.019	0.072
18-Jul	[a]	0.226	0.006	0.020	0.002	0.007	0.035	0.212	0.020	0.093
19-Jul	0.022	0.247	0.010	0.030	0.008	0.015	0.021	0.233	0.023	0.115
20-Jul	0.006	0.253 +	0.003	0.033	0.014	0.029	0.025	0.258 +	[a]	0.115
21-Jul	0.006	0.259	0.006	0.039	0.032	0.061	0.020	0.278	0.023	0.138
22-Jul	0.011	0.271	0.003	0.042	0.018	0.079	0.020	0.297	0.017	0.155
23-Jul	0.055	0.325	0.014	0.055	0.043	0.122	0.035	0.333	0.014	0.169
24-Jul	0.018	0.344	[a]	0.055	0.024	0.146	0.036	0.368	0.029	0.197
25-Jul	[a]	0.344	0.012	0.067	0.034	0.180	0.030	0.398	0.027	0.224
26-Jul	0.031	0.375	0.039	0.106	0.030	0.209	0.022	0.420	0.018	0.243
27-Jul	0.016	0.391	0.033	0.139	0.054	0.263 +	0.012	0.431	0.023	0.266 +
28-Jul	0.033	0.424	0.047	0.187	0.053	0.316	0.019	0.450	0.038	0.304
29-Jul	0.002	0.426	0.028	0.214	0.039	0.354	0.027	0.478	0.035	0.339
30-Jul	0.002	0.428	0.057	0.271 +	0.049	0.403	0.014	0.491	0.028	0.367
31-Jul	0.025	0.453	[a]	0.271	0.025	0.428	0.032	0.523	0.041	0.408
01-Aug	[a]	0.453	0.067	0.339	0.061	0.490	0.065	0.588 *	0.052	0.460
02-Aug	0.014	0.467	0.053	0.392	0.041	0.531 *	0.024	0.612	0.028	0.488
03-Aug	0.110	0.577 *	0.059	0.451	0.041	0.571	0.019	0.631	0.044	0.533 *
04-Aug	0.090	0.667	0.089	0.540 *	0.045	0.616	0.026	0.656	0.033	0.566
05-Aug	0.181	0.847 +	0.049	0.589	0.042	0.658	0.023	0.680	0.031	0.597
06-Aug	0.038	0.885	0.084	0.673	[a]	0.658	0.031	0.711	0.053	0.650
07-Aug	0.042	0.927	[a]	0.673	0.039	0.697	0.035	0.746	0.045	0.695
08-Aug	[a]	0.927	0.051	0.725	0.037	0.734	0.057	0.803	0.057	0.751 +
09-Aug	0.004	0.930	0.079	0.804 +	0.057	0.791 +	0.041	0.844 +	0.069	0.821
10-Aug	0.026	0.956	0.038	0.842	0.047	0.839	0.022	0.866	[a]	0.821
11-Aug	0.037	0.992	0.047	0.889	0.032	0.871	[a]	0.866	0.055	0.875
12-Aug	0.008	1.000	0.074	0.963	0.054	0.925	0.028	0.894	0.047	0.922
13-Aug			0.009	0.972	[a]	0.925	0.044	0.939	0.058	0.980
14-Aug			[a]	0.972	0.025	0.949	0.061	1.000	0.020	1.000
15-Aug			0.004	0.977	0.021	0.971				
16-Aug			0.013	0.990	0.029	1.000				
17-Aug			0.000	0.990						
18-Aug			0.000	0.990						
19-Aug			0.003	0.992						
20-Aug			0.000	0.992						
21-Aug			[a]	0.992						
22-Aug			0.000	0.992						
23-Aug			0.000	0.992						
24-Aug			0.000	0.992						
25-Aug			0.001	0.993						
26-Aug			0.005	0.998						
27-Aug			0.002	0.999						
28-Aug			0.001	1.000						
29-Aug			0.000	1.000						
30-Aug			0.000	1.000						
31-Aug										

[a] Regular day off.

The "*" indicate the first and third quartiles and "+" indicates the mid-way point.

Table 4. Kobuk River drift test fish chum salmon CPUE indices, mean CPUE and percent by drift and site, 1997.

Drift Period	Season CPUE Indices	No. of Period Drifts	Season Mean CPUE	Percent	Station	Season CPUE Indices	No. of Site Drifts	Season Mean CPUE	Percent
1 0800 hr.	787.8	33	23.9	33.1	N North Bank	431.7	34	12.7	27.3
2 1500 hr.	790.7	34	23.3	33.2	S South Bank	1,149.9	34	33.8	72.7
3 2200 hr.	803.4	34	23.6	33.7					
Total	2,381.9	101	23.6	100.0		1,581.6	68	23.3	100.0

Table 5. Kobuk River drift test fish chum salmon diurnal and spatial distribution expressed as mean CPUE by drift period and by site, 1993-1997. [a]

Year	Mean CPUE by Drift Period			Yearly Mean CPUE	Percent Mean CPUE by Drift Period			Mean CPUE by Site		Yearly Mean CPUE	Percent Mean CPUE by Site	
	1	2	3		1	2	3	N	S		N	S
1993	13.0	21.3	15.9	16.8	25.4	43.4	31.1	10.0	24.9	17.4	28.7	71.3
1994	25.8	33.2	23.7	27.5	31.7	39.8	28.5	4.9	53.5	29.2	8.4	91.6
1995	29.4	37.6	38.7	35.0	29.6	34.7	35.7	25.2	48.2	36.7	34.3	65.7
1996	73.2	81.7	66.5	73.8	32.4	37.2	30.3	40.7	108.1	74.4	27.3	72.7
1997	23.9	23.3	23.6	23.6	33.1	33.2	33.7	12.7	33.8	23.3	27.3	72.7

[a] Drift 1 begins at 0800, Drift 2 at 1500, Drift 3 at 2200. Site N is the North Bank (right bank), Site S is the South Bank (left bank).

Table 6. Kobuk River chum salmon drift test fishing CPUE and cumulative CPUE by drift, 1993-1997.

	1993			1994			1995			1996			1997		
Date	Drift	Daily	Cum.	Drift	Daily	Cum.	Drift	Daily	Cum.	Drift	Daily	Cum.	Drift	Daily	Cum.
9-Jul										1			1		
										2	7.7	7.7	2	0.0	0.0
										3	17.9	25.5	3	10.7	10.7
10-Jul										1	5.2	30.7	1	0.0	10.7
										2	21.1	51.8	2	0.0	10.7
										3	19.1	70.9	3	0.0	10.7
11-Jul										1	78.1	149.0	1	0.0	10.7
										2	103.3	252.3	2	5.3	15.9
										3	122.1	374.4	3	10.8	26.7
12-Jul	1	15.5	15.5				1	0.0	0.0	1	88.4	462.8	1	0.0	26.7
	2	2.5	18.0				2	0.0	0.0	2	32.2	495.0	2	16.0	42.7
	3	16.0	34.0				3	0.0	0.0	3	38.4	533.4	3	5.3	48.1
13-Jul	1	5.4	39.4	1	0.0	0.0	1	0.0	0.0	1	61.9	595.4	1 [a]		48.1
	2	15.5	54.9	2	0.0	0.0	2	2.9	2.9	2	97.2	692.6	2		48.1
	3	25.4	80.3	3	0.0	0.0	3	0.0	2.9	3	66.0	758.6	3		48.1
14-Jul	1	13.2	93.5	1	0.0	0.0	1	2.8	5.7	1 [a]		758.6	1	0.0	48.1
	2	0.0	93.5	2	5.3	5.3	2	5.5	11.2	2		758.6	2	7.9	56.0
	3	46.1	139.5	3	2.6	7.9	3	0.0	11.2	3		758.6	3	10.8	66.8
15-Jul	1	20.6	160.1	1	5.0	12.8	1	5.6	16.8	1	100.7	859.2	1	2.8	69.5
	2	33.9	194.0	2	2.6	15.4	2	0.0	16.8	2	52.9	912.2	2	8.2	77.7
	3	46.5	240.5	3	0.0	15.4	3	2.8	19.5	3	100.7	1,012.8	3	0.0	77.7
16-Jul	1	2.7	243.2	1	5.1	20.6	1 [a]		19.5	1	50.2	1,063.0	1	10.7	88.4
	2	32.5	275.7	2	10.4	31.0	2		19.5	2	82.3	1,145.3	2	11.3	99.7
	3	2.7	278.5	3	18.9	49.9	3		19.5	3	85.0	1,230.3	3	20.9	120.5
17-Jul	1	23.5	302.0	1 [a]		49.9	1	0.0	19.5	1	93.7	1,323.9	1	21.3	141.9
	2	28.7	330.7	2		49.9	2	0.0	19.5	2	34.3	1,358.2	2	8.3	150.2
	3	0.0	330.7	3		49.9	3	0.0	19.5	3	56.7	1,414.9	3	15.7	165.8
18-Jul	1 [a]		330.7	1	2.6	52.5	1	2.8	22.3	1	59.2	1,474.1	1	16.0	181.8
	2		330.7	2	0.0	52.5	2	2.7	25.0	2	98.3	1,572.4	2	10.9	192.7
	3		330.7	3	18.5	71.0	3	0.0	25.0	3	117.8	1,690.2	3	21.3	214.0
19-Jul	1	5.5	336.1	1	23.7	94.7	1	0.0	25.0	1	69.8	1,760.1	1	8.1	222.1
	2	2.7	338.8	2	10.3	105.0	2	12.9	37.9	2	61.2	1,821.2	2	18.7	240.8
	3	23.5	362.3	3	2.8	107.8	3	16.2	54.1	3	36.9	1,858.2	3	27.3	268.1
20-Jul	1	2.8	365.1	1	2.9	110.6	1	10.8	64.8	1	70.3	1,928.5	1 [a]		268.1
	2	5.4	370.5	2	8.1	118.7	2	16.4	81.2	2	69.8	1,998.3	2		268.1
	3	0.0	370.5	3	0.0	118.7	3	21.8	103.0	3	48.7	2,047.0	3		268.1
21-Jul	1	2.8	373.2	1	10.8	129.5	1	39.1	142.2	1	66.7	2,113.7	1	11.0	279.1
	2	5.5	378.7	2	11.0	140.6	2	27.0	169.1	2	45.7	2,159.4	2	34.3	313.4
	3	1.9	380.6	3	0.0	140.6	3	49.0	218.2	3	47.4	2,206.8	3	8.3	321.7
22-Jul	1	2.8	383.4	1	5.5	146.0	1	20.7	238.8	1	27.6	2,234.4	1	8.1	329.8
	2	0.0	383.4	2	2.6	148.6	2	24.0	262.8	2	72.3	2,306.7	2	0.0	329.8
	3	13.2	396.6	3	2.7	151.3	3	18.9	281.7	3	58.2	2,364.9	3	31.3	361.1
23-Jul	1	2.7	399.3	1	24.8	176.1	1	53.1	334.7	1	53.0	2,417.9	1	18.5	379.5
	2	26.1	425.4	2	13.5	189.6	2	59.2	394.0	2	142.9	2,560.8	2	10.8	390.3
	3	51.6	477.0	3	11.2	200.8	3	37.7	431.7	3	105.3	2,666.0	3	2.8	393.1
24-Jul	1	8.2	485.2	1 [a]		200.8	1	39.1	470.7	1	62.8	2,728.8	1	16.4	409.4
	2	8.1	493.3	2		200.8	2	36.5	507.2	2	100.3	2,829.1	2	20.1	429.5
	3	10.9	504.2	3		200.8	3	10.9	518.1	3	122.8	2,951.9	3	31.0	460.5
25-Jul	1 [a]		504.2	1	24.3	225.0	1	16.2	534.3	1	30.0	2,981.9	1	13.8	474.3
	2		504.2	2	13.5	238.5	2	10.9	545.2	2	157.7	3,139.6	2	24.3	498.6
	3		504.2	3	5.4	243.9	3	109.4	654.6	3	16.8	3,156.4	3	26.4	524.9
26-Jul	1	10.9	515.1	1	32.7	276.6	1	20.6	675.2	1	113.2	3,269.6	1	21.8	546.7
	2	8.1	523.2	2	63.7	340.3	2	35.5	710.6	2	5.2	3,274.9	2	11.0	557.8
	3	26.4	549.6	3	44.7	384.9	3	47.4	758.0	3	27.7	3,302.6	3	11.0	568.8
27-Jul	1	15.5	565.1	1	21.3	406.3	1	50.2	808.3	1	15.2	3,317.8	1	26.4	595.2
	2	8.1	573.1	2	59.4	465.6	2	34.7	842.9	2	19.6	3,337.4	2	15.8	611.0
	3	0.0	573.1	3 [b]		465.6	3	102.9	945.8	3	72.7	3,410.1	3	13.2	624.2
28-Jul	1	11.2	584.3	1 [b]		465.6	1	39.4	985.2	1	52.0	3,462.1	1	29.3	653.5
	2	16.2	600.5	2 [b]		465.6	2	88.2	1,073.4	2	83.8	3,545.9	2	28.1	681.6
	3	21.6	622.1	3	57.8	523.5	3	67.9	1,141.3	3	8.3	3,554.2	3	33.9	715.5

(continued)

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	1993			1994			1995			1996			1997		
Date	Drift	Daily	Cum.	Drift	Daily	Cum.	Drift	Daily	Cum.	Drift	Daily	Cum.	Drift	Daily	Cum.
29-Jul	1	2.7	624.8	1	34.3	557.7	1	48.8	1,190.0	1	110.0	3,664.2	1	34.3	749.8
	2	0.0	624.8	2	52.5	610.2	2	8.4	1,198.4	2	77.3	3,741.5	2	33.6	783.4
	3	0.0	624.8	3	19.3	629.6	3	85.1	1,283.5	3	20.4	3,761.9	3	16.2	799.6
30-Jul	1	0.0	624.8	1	83.1	712.6	1	67.1	1,350.5	1	51.1	3,813.0	1	13.3	812.9
	2	0.0	624.8	2	38.5	751.2	2	59.2	1,409.7	2	36.0	3,849.0	2	21.3	834.2
	3	2.8	627.5	3	82.0	833.1	3	48.6	1,458.3	3	22.9	3,871.8	3	33.0	867.2
31-Jul	1	16.2	643.7	1 [a]		833.1	1	49.0	1,507.4	1	71.3	3,943.1	1	24.6	891.8
	2	16.2	659.9	2		833.1	2	20.9	1,528.2	2	120.0	4,063.1	2	30.0	921.8
	3	5.4	665.3	3		833.1	3	19.1	1,547.3	3	59.1	4,122.2	3	42.5	964.3
1-Aug	1 [a]		665.3	1	51.4	884.5	1	61.5	1,608.8	1	122.2	4,244.4	1	55.6	1,019.9
	2		665.3	2	124.7	1,009.2	2	81.0	1,689.8	2	252.2	4,496.6	2	32.0	1,051.9
	3		665.3	3	67.2	1,076.4	3	76.9	1,766.8	3	80.0	4,576.6	3	37.6	1,089.5
2-Aug	1 [b]		665.3	1	27.0	1,103.4	1	45.0	1,811.8	1	120.0	4,696.6	1	20.9	1,110.3
	2	0.0	665.3	2	74.6	1,178.0	2	66.2	1,878.0	2	30.6	4,727.2	2	28.4	1,138.8
	3	13.3	678.6	3	92.8	1,270.8	3	35.5	1,913.4	3	28.5	4,755.7	3	18.9	1,157.6
3-Aug	1	42.2	720.8	1	62.3	1,333.1	1	53.7	1,967.1	1	76.7	4,832.3	1	33.9	1,191.5
	2	71.5	792.3	2	93.9	1,427.0	2	74.4	2,041.4	2	60.9	4,893.2	2	36.3	1,227.8
	3 [b]		792.3	3	51.7	1,478.7	3	22.1	2,063.5	3	3.8	4,896.9	3	35.5	1,263.3
4-Aug	1	16.7	809.1	1	124.9	1,603.6	1	45.3	2,108.8	1	52.0	4,948.9	1	29.6	1,292.9
	2	60.0	869.1	2	120.0	1,723.6	2	60.0	2,168.8	2	26.0	4,974.9	2	31.4	1,324.3
	3	51.3	920.3	3	82.4	1,806.0	3	53.8	2,222.6	3	145.0	5,119.9	3	19.3	1,343.6
5-Aug	1	40.9	961.2	1	78.9	1,884.9	1	55.1	2,277.8	1	53.8	5,173.7	1	23.0	1,366.6
	2	191.6	1,152.8	2	14.1	1,899.0	2	38.8	2,316.6	2	40.8	5,214.4	2	30.6	1,397.3
	3	2.7	1,155.5	3	78.3	1,977.3	3	56.7	2,373.3	3	80.0	5,294.4	3	19.1	1,416.4
6-Aug	1	12.8	1,168.3	1	116.1	2,093.5	1 [a]		2,373.3	1	44.1	5,338.5	1	41.9	1,458.2
	2	13.8	1,182.1	2	93.3	2,186.8	2		2,373.3	2	43.3	5,381.8	2	39.6	1,497.8
	3	29.3	1,211.4	3	92.9	2,279.7	3		2,373.3	3	148.0	5,529.8	3	45.7	1,543.5
7-Aug	1	47.5	1,258.9	1 [a]		2,279.7	1	55.8	2,429.1	1	136.3	5,666.1	1	35.1	1,578.6
	2	2.8	1,261.6	2		2,279.7	2	68.1	2,497.2	2	57.6	5,723.7	2	34.7	1,613.4
	3	8.4	1,270.0	3		2,279.7	3	19.8	2,516.9	3	51.8	5,775.4	3	38.1	1,651.4
8-Aug	1 [a]		1,270.0	1	77.7	2,357.3	1	21.6	2,538.5	1	94.6	5,870.0	1	69.0	1,720.5
	2		1,270.0	2	64.8	2,422.1	2	74.4	2,612.9	2	221.8	6,091.8	2	49.9	1,770.3
	3		1,270.0	3	49.7	2,471.8	3	41.7	2,654.6	3	98.8	6,190.6	3	11.4	1,781.8
9-Aug	1	5.5	1,275.5	1	85.2	2,556.9	1	38.9	2,693.5	1	120.0	6,310.6	1	45.5	1,827.2
	2	0.0	1,275.5	2	125.7	2,682.6	2	58.1	2,751.6	2	133.3	6,443.9	2	37.2	1,864.4
	3	0.0	1,275.5	3	74.8	2,757.4	3	114.1	2,865.7	3	66.5	6,510.4	3	94.3	1,958.7
10-Aug	1	0.0	1,275.5	1	9.5	2,766.9	1	73.2	2,938.9	1	32.5	6,542.9	1 [a]		1,958.7
	2	8.1	1,283.6	2	54.9	2,821.8	2	29.6	2,968.5	2	98.6	6,641.5	2		1,958.7
	3	29.3	1,313.0	3	86.0	2,907.8	3	71.3	3,039.8	3	42.6	6,684.1	3		1,958.7
11-Aug	1	11.3	1,324.2	1	105.8	3,013.6	1	56.8	3,096.6	1 [a]		6,684.1	1	43.6	2,002.4
	2	40.4	1,364.7	2	50.7	3,064.3	2	20.9	3,117.5	2		6,684.1	2	32.7	2,035.1
	3	0.0	1,364.7	3	9.4	3,073.7	3	34.3	3,151.8	3		6,684.1	3	56.0	2,091.1
12-Aug	1	11.3	1,376.0	1	17.9	3,091.6	1	31.3	3,183.1	1	123.3	6,807.4	1	36.7	2,127.8
	2	0.0	1,376.0	2	183.2	3,274.8	2	105.5	3,288.5	2	39.1	6,846.5	2	54.0	2,181.8
	3	0.0	1,376.0	3	0.0	3,274.8	3	56.3	3,344.8	3	28.2	6,874.7	3	16.0	2,197.8
13-Aug				1	23.5	3,298.3	1 [a]		3,344.8	1	105.2	6,979.9	1	41.1	2,238.9
				2	10.0	3,308.3	2		3,344.8	2	136.6	7,116.5	2	55.4	2,294.3
				3	3.4	3,311.7	3		3,344.8	3	102.9	7,219.4	3	39.3	2,333.6
14-Aug				1 [a]		3,311.7	1	8.1	3,352.9	1	77.3	7,296.7	1	35.2	2,368.8
				2		3,311.7	2	54.4	3,407.3	2	197.3	7,493.9	2	13.0	2,381.8
				3		3,311.7	3	23.5	3,430.8	3	181.5	7,675.4	3		
15-Aug				1	7.0	3,318.7	1	25.5	3,456.2	1			1		
				2	8.1	3,326.8	2	18.5	3,474.7	2			2		
				3	0.0	3,326.8	3	32.0	3,506.7	3			3		
16-Aug				1	3.3	3,330.1	1	22.9	3,529.5	1			1		
				2	33.8	3,363.9	2	45.4	3,574.9	2			2		
				3	11.3	3,375.1				3			3		

(continued)

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	1993			1994			1995			1996			1997		
Date	Drift	Daily	Cum.	Drift	Daily	Cum.	Drift	Daily	Cum.	Drift	Daily	Cum.	Drift	Daily	Cum.
17-Aug				1	0.0	3,375.1				1			1		
				2	0.0	3,375.1				2			2		
				3	0.0	3,375.1				3			3		
18-Aug				1	0.0	3,375.1				1			1		
				2	0.0	3,375.1				2			2		
				3	0.0	3,375.1				3			3		
19-Aug				1	8.3	3,383.4				1			1		
				2	0.0	3,383.4				2			2		
				3	3.0	3,386.4				3			3		
20-Aug				1	0.0	3,386.4				1			1		
				2	0.0	3,386.4				2			2		
				3	0.0	3,386.4				3			3		
21-Aug				1 [a]		3,386.4				1			1		
				2		3,386.4				2			2		
				3		3,386.4				3			3		
22-Aug				1	0.0	3,386.4				1			1		
				2	0.0	3,386.4				2			2		
				3	0.0	3,386.4				3			3		
23-Aug				1	0.0	3,386.4				1			1		
				2	0.0	3,386.4				2			2		
				3	0.0	3,386.4				3			3		
24-Aug				1	0.0	3,386.4				1			1		
				2	0.0	3,386.4				2			2		
				3	0.0	3,386.4				3			3		
25-Aug				1	0.0	3,386.4				1			1		
				2	2.7	3,389.2				2			2		
				3	0.0	3,389.2				3			3		
26-Aug				1	2.8	3,391.9				1			1		
				2	13.8	3,405.7				2			2		
				3	0.0	3,405.7				3			3		
27-Aug				1	2.8	3,408.5				1			1		
				2	0.0	3,408.5				2			2		
				3	2.8	3,411.3				3			3		
28-Aug				1	2.8	3,414.1				1			1		
				2	0.0	3,414.1				2			2		
				3	0.0	3,414.1				3			3		
29-Aug				1	0.0	3,414.1				1			1		
				2	0.0	3,414.1				2			2		
				3	0.0	3,414.1				3			3		
30-Aug				1	0.0	3,414.1				1			1		
				2		3,414.1				2			2		
				3						3			3		

[a] Regular day off.

[b] No drift conducted because of mechanical problems or bad weather.

Table 7. Kobuk River chum salmon drift test fishery catch age and sex composition by week, 1997.

		Brood Year and (Age Group)					
		1994 (0.2)	1993 (0.3)	1992 (0.4)	1991 (0.5)	1990 (0.6)	Total
Stratum Dates:	7/09-7/18						
Sampling Dates:	7/09-7/18						
Sample Size:	80						
Female	Percent of Catch	0.0	2.5	35.0	12.5	0.0	50.0
	Number in Catch	0	2	28	10	0	40
Male	Percent of Catch	0.0	6.3	31.3	12.5	0.0	50.0
	Number in Catch	0	5	25	10	0	40
Total	Percent of Catch	0.0	8.8	66.3	25.0	0.0	100.0
	Number in Catch	0	7	53	20	0	80
	Standard Error	0	3	4	4	0	
Stratum Dates:	7/19-7/25						
Sampling Dates:	7/19-7/25						
Sample Size:	104						
Female	Percent of Catch	0.0	4.8	26.9	8.7	0.0	40.4
	Number in Catch	0	5	28	9	0	42
Male	Percent of Catch	0.0	10.6	33.7	15.4	0.0	59.6
	Number in Catch	0	11	35	16	0	62
Total	Percent of Catch	0.0	15.4	60.6	24.0	0.0	100.0
	Number in Catch	0	16	63	25	0	104
	Standard Error	0	4	5	4	0	
Stratum Dates:	7/26-8/01						
Sampling Dates:	7/26-8/01						
Sample Size:	184						
Female	Percent of Catch	0.0	6.5	31.5	8.7	0.0	46.7
	Number in Catch	0	12	58	16	0	86
Male	Percent of Catch	0.0	11.4	34.8	6.0	1.1	53.3
	Number in Catch	0	21	64	11	2	98
Total	Percent of Catch	0.0	17.9	66.3	14.7	1.1	100.0
	Number in Catch	0	33	122	27	2	184
	Standard Error	0	5	6	5	1	

(continued)

Table 7. (page 2 of 2)

		Brood Year and (Age Group)					
		1994 (0.2)	1993 (0.3)	1992 (0.4)	1991 (0.5)	1990 (0.6)	Total
Stratum Dates:	8/02-8/08						
Sampling Dates:	8/02-8/08						
Sample Size:	221						
Female	Percent of Catch	0.9	11.3	23.5	5.9	0.0	41.6
	Number in Catch	2	25	52	13	0	92
Male	Percent of Catch	1.4	18.1	29.0	10.0	0.0	58.4
	Number in Catch	3	40	64	22	0	129
Total	Percent of Catch	2.3	29.4	52.5	15.8	0.0	100.0
	Number in Catch	5	65	116	35	0	221
	Standard Error	2	7	7	5	0	
Stratum Dates:	8/09-8/14						
Sampling Dates:	8/09-8/14						
Sample Size:	167						
Female	Percent of Catch	0.6	15.0	25.7	1.2	0.0	42.5
	Number in Catch	1	25	43	2	0	71
Male	Percent of Catch	2.4	21.0	30.5	3.6	0.0	57.5
	Number in Catch	4	35	51	6	0	96
Total	Percent of Catch	3.0	35.9	56.3	4.8	0.0	100.0
	Number in Catch	5	60	94	8	0	167
	Standard Error	2	6	6	3	0	
Stratum Dates:	7/09-8/14						
Sampling Dates:	7/09-8/14			Season Total			
Sample Size:	756						
Female	Percent of Catch	0.4	9.1	27.6	6.6	0.0	44
	Number in Catch	3	69	209	50	0	331
Male	Percent of Catch	0.9	14.8	31.6	8.6	0.3	56
	Number in Catch	7	112	239	65	2	425
Total	Percent of Catch	1.3	23.9	59.3	15.2	0.3	100.0
	Number in Catch	10	181	448	115	2	756
	Standard Error						

Table 8. Comparison of chum salmon age and sex composition and mean length from the Kobuk and Noatak drift test fishing catch, and the Kotzebue District commercial catch, 1997.

		Brood Year and (Age Group)					
		1994 (0.2)	1993 (0.3)	1992 (0.4)	1991 (0.5)	1990 (0.6)	Total
Stratum Dates:	7/09-8/14						
Sample Size:	756		Kobuk River				
Female	Percent of Catch	0.4	9.1	27.6	6.6	0.0	43.8
	Number in Catch	3	69	209	50	0	331
	Mean Length (mm)	550.0	596.4	613.0	623.8		
Male	Percent of Catch	0.9	14.8	31.6	8.6	0.3	56.2
	Number in Catch	7	112	239	65	2	425
	Mean Length (mm)	562.0	619.4	637.4	646.5	612.5	
Total	Percent of Catch	1.3	23.9	59.3	15.2	0.3	100.0
	Number in Catch	10	181	448	115	2	756
	Standard Error	3	12	14	10	1	
Stratum Dates:	7/27 - 8/28						
Sample Size:	214		Noatak River				
Female	Percent of Catch	0.0	10.7	19.6	2.3	0.0	32.7
	Number in Catch	0	23	42	5	0	70
	Mean Length (mm)		604.3	618.6	624.8		
Male	Percent of Catch	0.5	23.4	36.4	6.5	0.5	67.3
	Number in Catch	1	50	78	14	1	144
	Mean Length (mm)		565.0	613.0	635.9	653.2	
Total	Percent of Catch	0.5	34.1	56.1	8.9	0.5	100
	Number in Catch	1	73	120	19	1	214
	Standard Error	1	7	7	4	1	
Stratum Dates:	7/10/97						
Sampling Dates	8/29/97		Kotzebue Commercial Catch				
Sample Size:	4,824						
Female	Percent of Sample	0.3	11.8	25.6	4.1	0.6	42.4
	Number in Catch	467	16,837	36,524	5,863	790	60,481
	Mean Length (mm)	559.9	587.7	608.7	620.1	640.9	
Male	Percent of Sample	1.1	16.9	32.7	6.1	0.8	57.6
	Number in Catch	1,580	24,175	46,670	8,661	1,152	82,239
	Mean Length (mm)	564.4	610.3	639.4	653.6	663.1	
Total	Percent of Sample	1.4	28.7	58.3	10.2	1.4	100
	Number in Catch	2,047	41,011	83,195	14,524	1,942	142,720
	Standard Error	244	930	1,013	621	238	

Table 9. Kobuk River drift test fishing climatological data, 1997.

Date	Water Level (inches)	Water Level Adjusted to 0	Water Temp. (C)	Secchi (meters)	Wind Direction	Wind MPH	Cloud Cover	Precip.
9-Jul	22.0	0.0	17	4.0	SW	5	4	2
10-Jul	23.0	1.0	17	4.0	SW	10	4	1
11-Jul	24.0	2.0	15	4.0	SW	15	4	1
12-Jul	25.5	3.5	14	3.0	S	5	3	7
13-Jul [a]								
14-Jul	22.5	0.5	14	4.0	N	3	3	7
15-Jul	23.0	1.0	13	3.0	N	5	3	7
16-Jul	22.0	0.0	14	3.5	N	5	2	7
17-Jul	22.0	0.0	15	4.0	calm		1	7
18-Jul	21.5	-0.5	16	3.0	W	10	1	7
19-Jul	21.0	-1.0	16	3.5	W	3	1	7
20-Jul [a]								
21-Jul	21.5	-0.5	13	4.0	SW	4	1	7
22-Jul	22.5	0.5	17	3.0	SW	13	1	7
23-Jul	23.0	1.0	17	3.5	W	10	1	7
24-Jul	27.5	5.5	17	3.5	SW	10	4	2
25-Jul	29.5	7.5	16	4.0	SW	10	4	2
26-Jul	33.0	11.0	15	3.5	E	5	4	7
27-Jul	34.5	12.5	14	4.5	SW	5	4	7
28-Jul	33.5	11.5	14	4.0	E	7	3	7
29-Jul	32.0	10.0	14	4.0	E	20	1	7
30-Jul	31.0	9.0	17	3.5	E	15	1	7
31-Jul	29.0	7.0	16	3.5	E	3	1	7
1-Aug	23.0	1.0	19	4.5	E	2	1	7
2-Aug	24.0	2.0	19	5.5	SW	10	3	7
3-Aug	22.0	0.0	19	5.0	SW	10	4	1
4-Aug	25.0	3.0	18	5.0	SW	20	3	7
5-Aug	27.0	5.0	16	3.5	calm		4	2
6-Aug	26.0	4.0	12	4.5	SW	5	2	7
7-Aug	27.5	5.5	12	4.5	SW	8	4	1
8-Aug	34.0	12.0	11	4.5	SE	10	2	7
9-Aug	41.0	19.0	16	3.5	E	5	1	7
10-Aug [a]								
11-Aug	38.0	16.0	13	2.5	E	10	3	7
12-Aug	32.0	10.0	16	2.5	E	5	4	2
13-Aug	39.5	17.5	17	3.5	E	3	3	7
14-Aug	34.5	12.5	16	3.0	calm		3	7

[a] Regular day off.

Cloud Cover:
- 0 - No observation
- 1 - Clear sky; cloud cover less than 1/10th of the sky
- 2 - Cloud cover not more than 1/2 of the sky
- 3 - Cloud cover more than 1/2 of the sky
- 4 - Sky is completely overcast
- 5 - Fog or thick haze (smoke, dust, etc.)

Precipication:
- 0 - No observation
- 1 - Intermitent rain
- 2 - Continuous rain
- 3 - Snow
- 4 - Mixed rain and snow
- 5 - Hail
- 6 - Thunderstorms
- 7 - No precipication

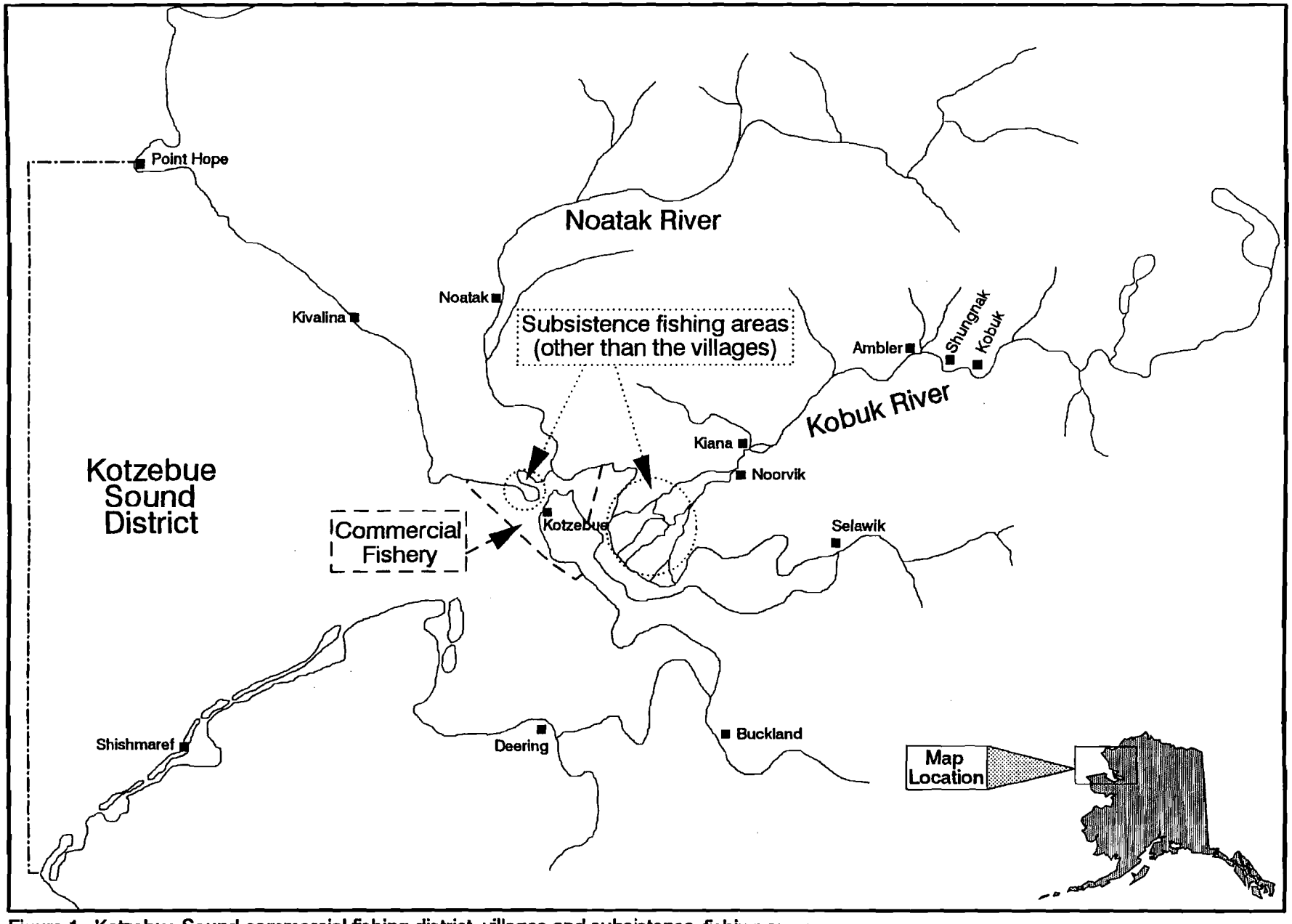
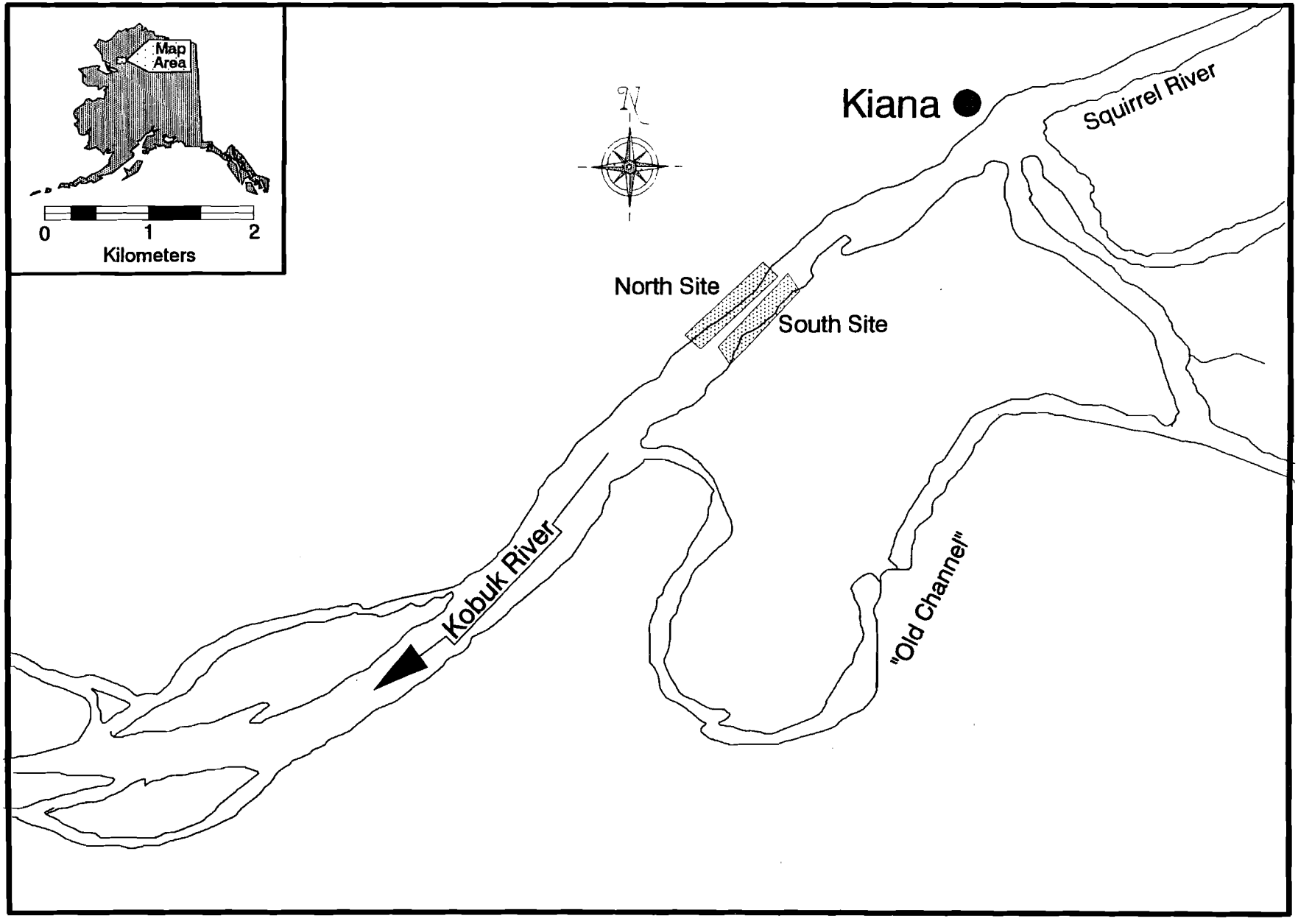


Figure 1. Kotzebue Sound commercial fishing district, villages and subsistence fishing areas.



ure 2. Lower Kobuk River drift test fishing sites.

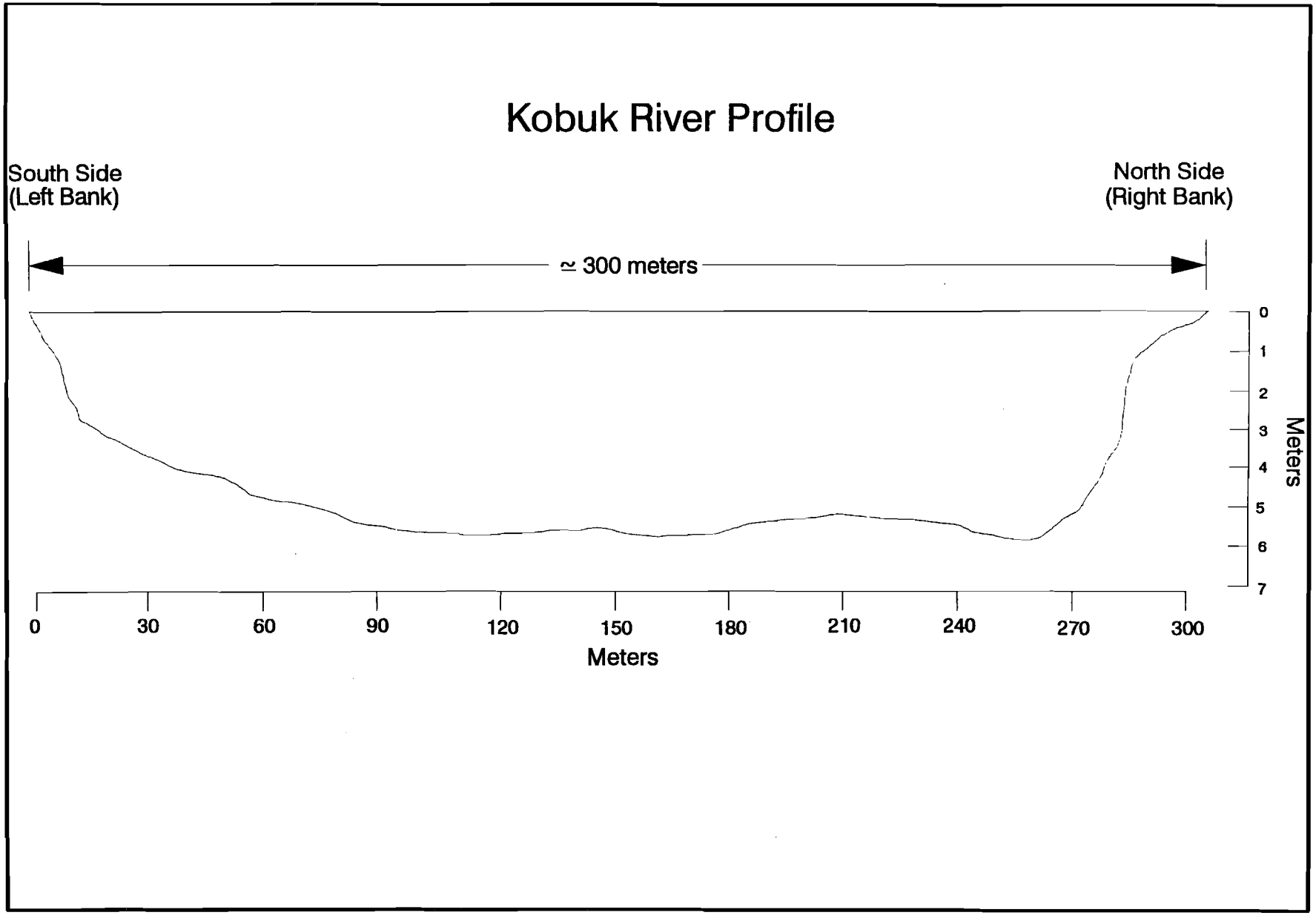
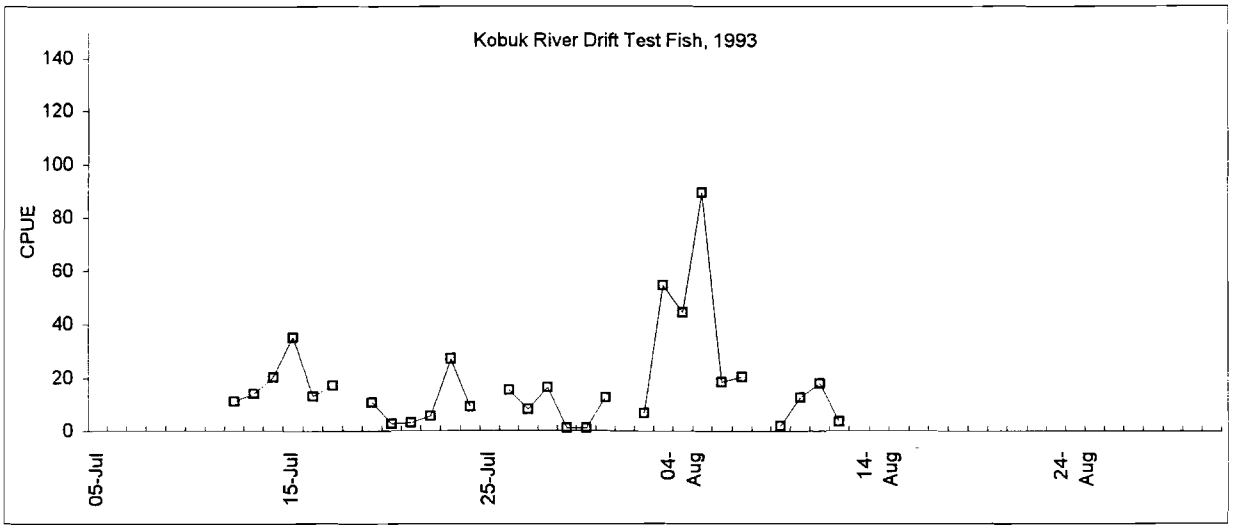
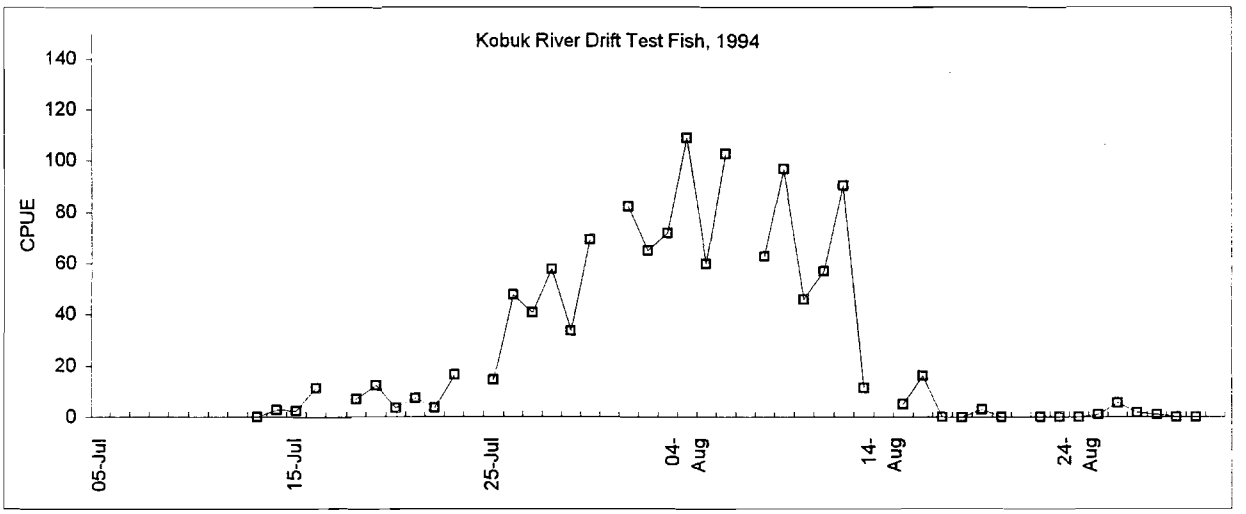


Figure 3. Kobuk River bottom profile at the test fishing site, August 1, 1997.





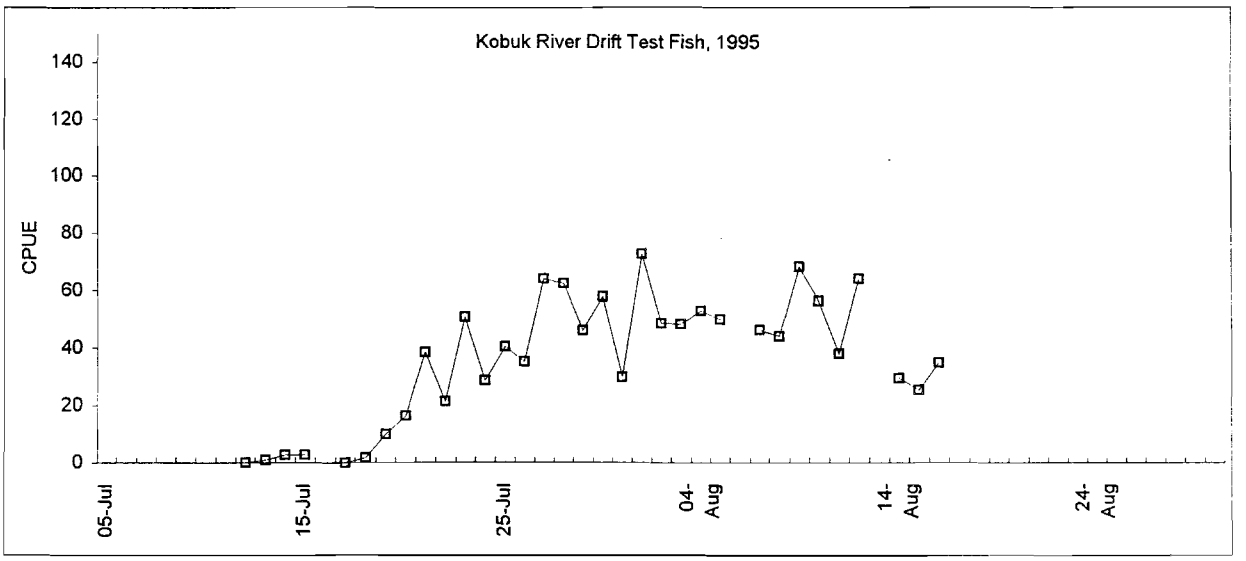
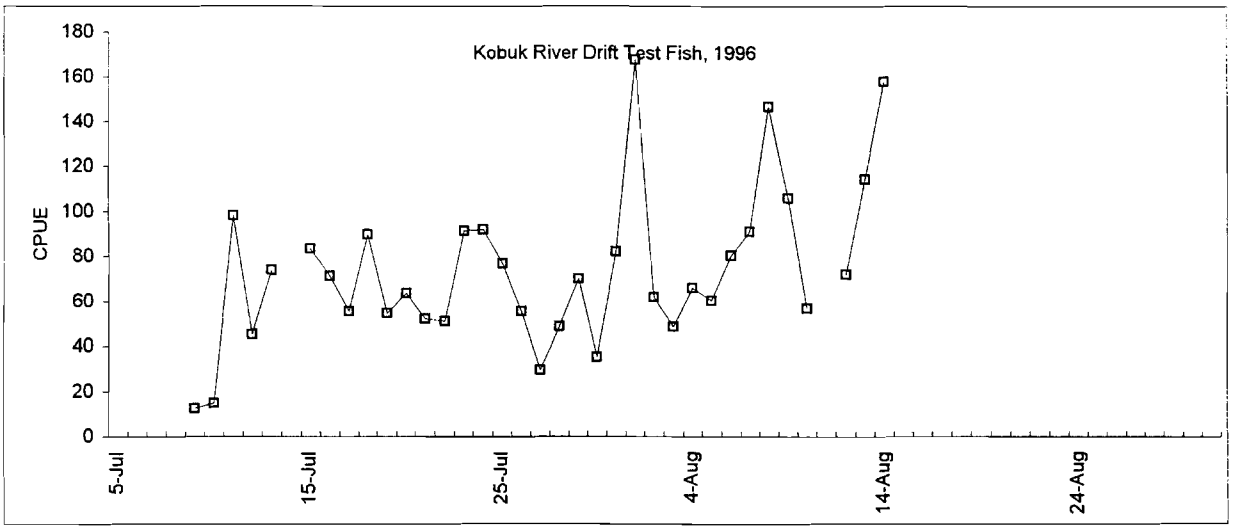
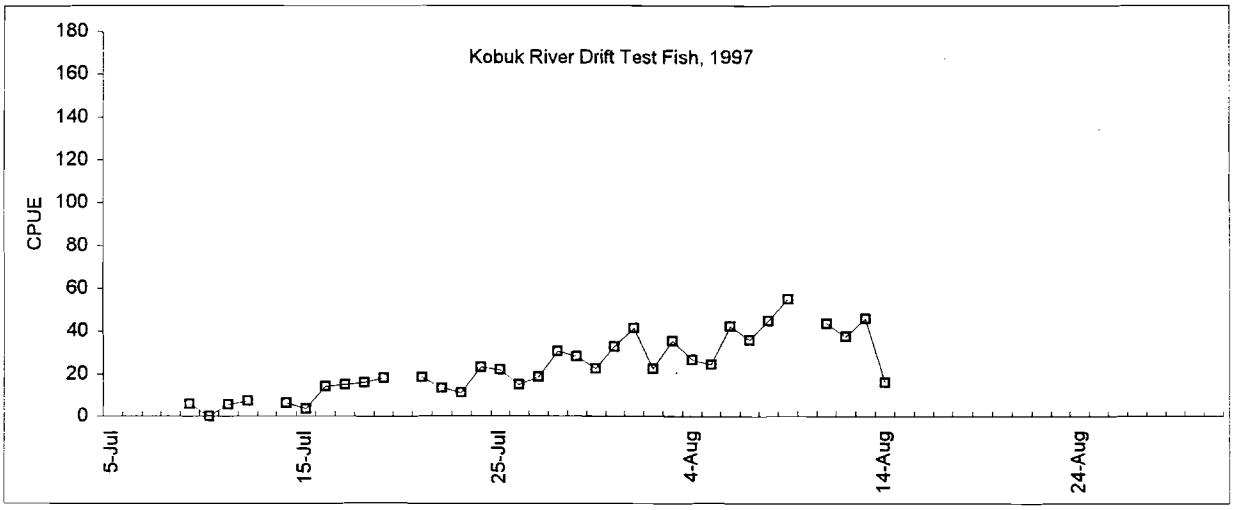


Figure 4. Kobuk River chum salmon drift test fishing daily CPUE, 1993-1997.





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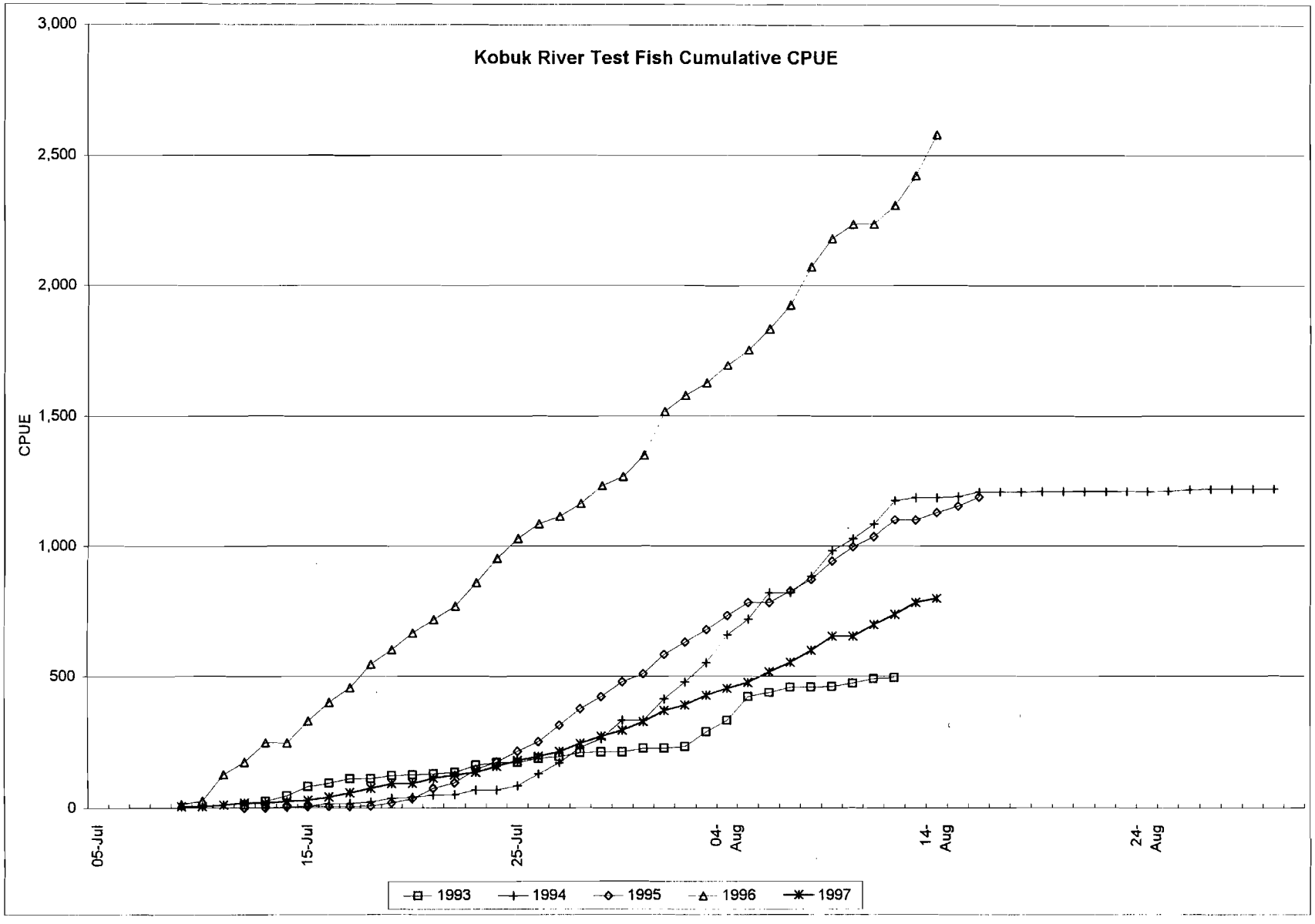

Figure 5. Kobuk River chum salmon drift test fishing cumulative CPUE, 1993-1997.

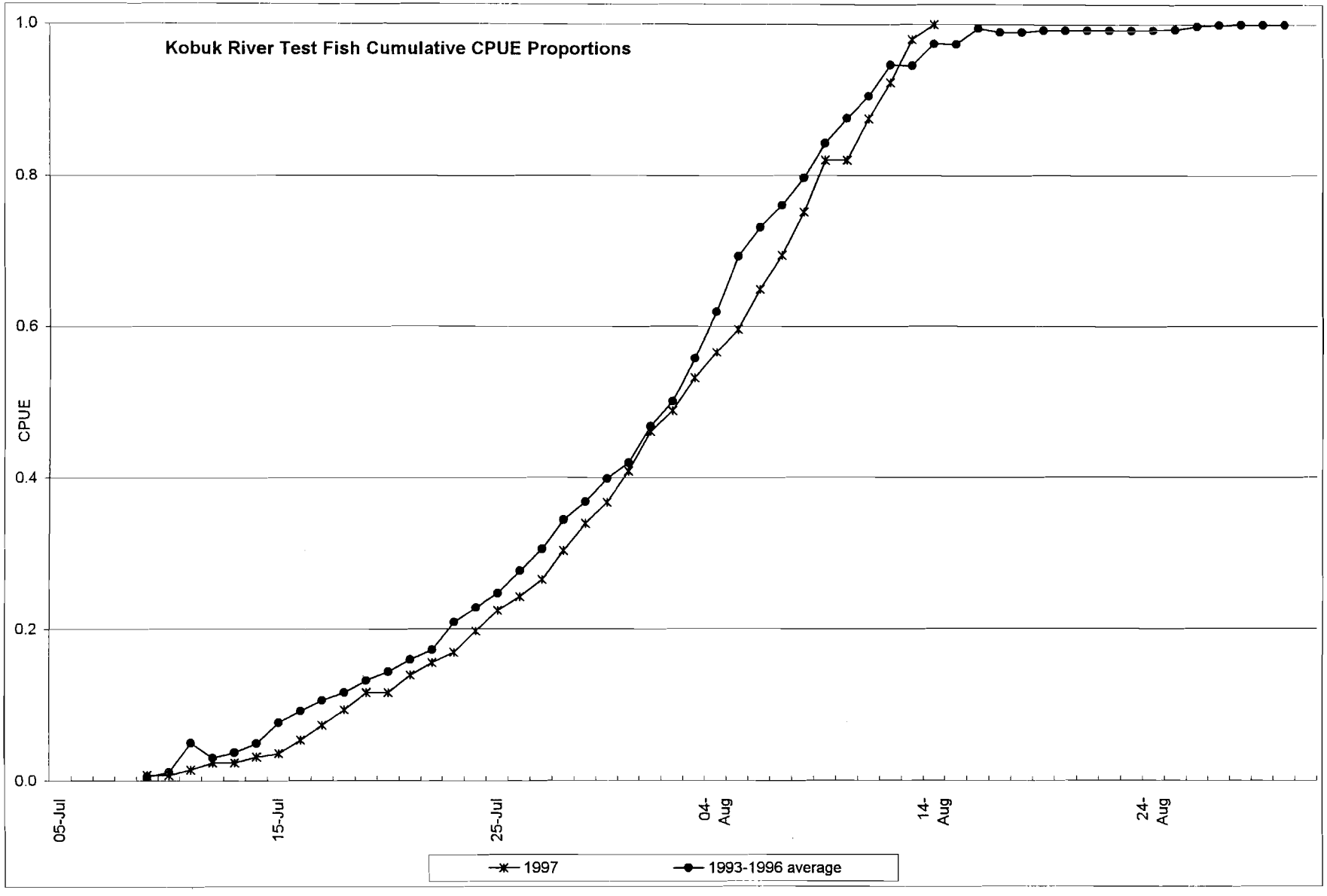

Figure 6. Kobuk River chum salmon drift test fishing cumulative CPUE proportions, 1993-1997.

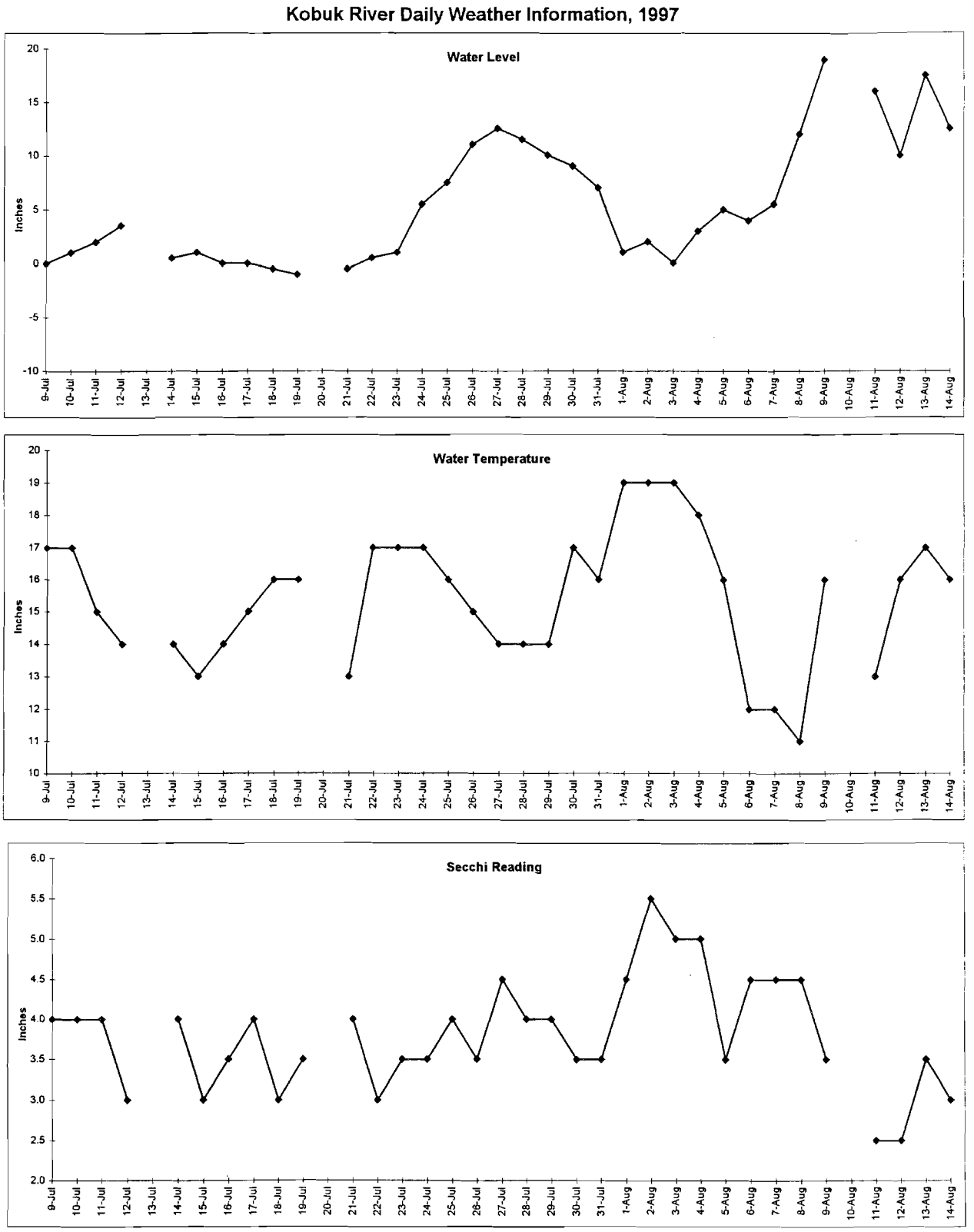

Figure 7. Kobuk River test fish site water depth, temperature and secchi indicator by day, 1997.