

**Fishery Data Series No. 10-74**

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# **Kobuk River Test Fishing Project, 2008**

by

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and

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November 2010

Alaska Department of Fish and Game

Divisions of Sport Fish and Commercial Fisheries



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<b>Weights and measures (metric)</b>		<b>General</b>		<b>Mathematics, statistics</b>	
centimeter	cm	Alaska Administrative Code	AAC	<i>all standard mathematical signs, symbols and abbreviations</i>	
deciliter	dL	all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.	alternate hypothesis	$H_A$
gram	g	all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.	base of natural logarithm	$e$
hectare	ha	at	@	catch per unit effort	CPUE
kilogram	kg	compass directions:		coefficient of variation	CV
kilometer	km	east	E	common test statistics	(F, t, $\chi^2$ , etc.)
liter	L	north	N	confidence interval	CI
meter	m	south	S	correlation coefficient (multiple)	R
milliliter	mL	west	W	correlation coefficient (simple)	r
millimeter	mm	copyright	©	covariance	cov
		corporate suffixes:		degree (angular)	$^\circ$
<b>Weights and measures (English)</b>		Company	Co.	degrees of freedom	df
cubic feet per second	ft <sup>3</sup> /s	Corporation	Corp.	expected value	$E$
foot	ft	Incorporated	Inc.	greater than	>
gallon	gal	Limited	Ltd.	greater than or equal to	$\geq$
inch	in	District of Columbia	D.C.	harvest per unit effort	HPUE
mile	mi	et alii (and others)	et al.	less than	<
nautical mile	nmi	et cetera (and so forth)	etc.	less than or equal to	$\leq$
ounce	oz	exempli gratia (for example)	e.g.	logarithm (natural)	ln
pound	lb	Federal Information Code	FIC	logarithm (base 10)	log
quart	qt	id est (that is)	i.e.	logarithm (specify base)	log <sub>2</sub> , etc.
yard	yd	latitude or longitude	lat. or long.	minute (angular)	'
		monetary symbols (U.S.)	\$, ¢	not significant	NS
<b>Time and temperature</b>		months (tables and figures): first three letters	Jan, ..., Dec	null hypothesis	$H_0$
day	d	registered trademark	®	percent	%
degrees Celsius	°C	trademark	™	probability	P
degrees Fahrenheit	°F	United States (adjective)	U.S.	probability of a type I error (rejection of the null hypothesis when true)	$\alpha$
degrees kelvin	K	United States of America (noun)	USA	probability of a type II error (acceptance of the null hypothesis when false)	$\beta$
hour	h	U.S.C.	United States Code	second (angular)	"
minute	min	U.S. state	use two-letter abbreviations (e.g., AK, WA)	standard deviation	SD
second	s			standard error	SE
				variance	
<b>Physics and chemistry</b>				population	Var
all atomic symbols				sample	var
alternating current	AC				
ampere	A				
calorie	cal				
direct current	DC				
hertz	Hz				
horsepower	hp				
hydrogen ion activity (negative log of)	pH				
parts per million	ppm				
parts per thousand	ppt, ‰				
volts	V				
watts	W				

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## ABSTRACT

The Kobuk and Noatak rivers produce chum salmon, *Oncorhynchus keta*, which contribute to subsistence and commercial fisheries in the Kotzebue Sound area. A drift gillnet test fishery has been operated annually on the Kobuk River to monitor the relative abundance, run timing, and age, sex, and length (ASL) data for chum salmon returns to the Kobuk River. A total of 200 drifts were fished from 9 July through 14 August 2008 and 2,281 chum salmon were caught. Cumulative catch per unit effort (CPUE) was 2,268.79, which was the second highest in the 16 years of the project. The midpoint of the test fishery CPUE was on 30 July. Age-0.3 chum salmon comprised 47.7% of test fishery samples and age-0.4 comprised 44.7% of the samples. A total of 880 sheefish were caught. The sheefish *Stenodus leucichthys* CPUE was 821.73 and was a record for the 11 years that sheefish catches have been recorded. Kobuk River, Noatak River, and Kotzebue Sound commercial chum salmon ASL composition was similar among all sample sources. The percentage of age-0.2 fish was near zero from all sample sources and age-0.3 chum salmon represented a majority of the samples in all fisheries. The 68.2% age-0.3 samples in the commercial chum salmon catch and 72.9% age-0.3 observed in the Noatak River test fishery samples were the third and fourth highest observed since 1993, respectively. Similarly, the 20.3% age-0.4 in the Noatak River samples and 24.3% age-0.4 in the commercial samples were the third lowest since 1993.

Key words: Kobuk, River chum salmon, *Oncorhynchus keta*, age, catch per unit effort, sheefish, *Stenodus leucichthys*.

## INTRODUCTION

The Kobuk River originates on the south side of the Brooks Range in the Arrigetch (“Fingers Outstretched”) Peaks inside the Gates of the Arctic National Park. The river flows approximately 500 river miles (800 rkm) west where it terminates at Hotham Inlet. The lower two-thirds of the river are stained by tannin primarily from the Pah River, an upper river tributary. Five villages are located on the Kobuk River: Noorvik, Kiana, Ambler, Shungnak, and Kobuk, and all depend on chum salmon (*Oncorhynchus keta*) for subsistence use. In addition, residents of Kotzebue also depend on Kobuk River chum salmon as a subsistence resource. The Kobuk River is thought to support up to 60% of the commercial catch of chum salmon in the Kotzebue District.

This was the sixteenth consecutive year in which a test drift gillnet fishery project operated in the lower Kobuk River (Kohler 2000a, b, 2001, 2002; Lingnau 1993–1997; Menard 2003, 2004; Menard and Kent 2005–2008). Because of the Kobuk River’s tannic stain, test fishing is less susceptible to net avoidance behavior by salmon than in clear water systems. The only previous salmon project in the Kobuk River drainage was a counting tower operated in 1982 and 1984 on the Squirrel River, too distant to provide timely information for fisheries management.

Management of the Kotzebue District commercial salmon fishery, particularly during the month of July, is dependent primarily on the comparison of commercial fishing period and cumulative season catch statistics to those of prior years. Because of the change in market demand in the last decade, these comparisons are no longer reliable. The test drift gillnet fishery 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. Therefore, the catch per unit effort (CPUE) should be interpreted as a relative index of abundance if calibration is not possible among years. This report presents the results of the 2008 Kobuk River test drift gillnet fishery project and compares these data to catch and CPUE in past years.

The Noatak River is the other major river in the Kotzebue District and it flows approximately 420 river miles (680 km) from its headwaters in the Schwatka Mountains to Kotzebue Sound. Only one village, Noatak, is located on the Noatak River.

Sporadically in the 1980s and 1990s a sonar project was operated to estimate salmon passage on the Noatak River. The last year of sonar operations was in 1994 (LaFlamme 1995). Periodically, Alaska Department of Fish and Game (ADF&G) and National Park Service personnel will operate a test fishery for salmon in the lower Noatak River, usually in August, if personnel are available and if Kotzebue Sound is safe for boat travel. The test fishery location and time fished is opportunistic depending on the weather, tide stage and run strength. Age, sex and length (ASL) sampling is conducted for comparison with salmon from the Kotzebue commercial catch samples and Kobuk River test fishery catch samples. Taken collectively, age data collected in the Noatak and Kobuk River chum salmon test fisheries are used by area managers to estimate brood year survival and contribution to returns. More applicably, this information is useful both for determining if inseason assessments of run strength are consistent with preseason forecasts and for developing run forecasts for subsequent seasons.

## **OBJECTIVES**

The objectives of the test drift gillnet fishery project for 2008 were to:

1. Estimate the relative index of abundance (i.e., CPUE) of chum salmon migrating into the Kobuk River drainage and compare it to historical data.
2. Describe the migratory timing of chum salmon in the lower Kobuk River.
3. Collect age, sex, and length (ASL) data on chum salmon and compare these data with Kotzebue commercial catch samples and Noatak River test fishery catch samples.

## **METHODS**

### **SITE DESCRIPTION**

The Kobuk River project is located approximately 70 river miles (110 km) from the eastern boundary of the commercial salmon fishing district (Figure 1). The test fishery site was selected because it was the lowest downstream location where there was a single channel below all tributaries that support spawning chum salmon. The site consists of a 1-mile river section located approximately 3 miles downstream from the community of Kiana. The width of the river is approximately 200 meters and is divided into 2 sites (Figure 2). Site N is the north side of the river (right bank when facing downstream), 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. This site has the slowest current. A bottom profile at the test fishery site in 1997 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 (Lingnau 1997). Bottom profiles were recorded again in 2005 at the test fishery site, and the channel had an average depth of 5.5 m and a maximum depth of 9 m in the third quartile from the right bank (Figure 3).

### **TEST FISHING**

Test fishing was scheduled to sample salmon passage during 3 different segments of the day at each of the 2 sites: morning (0800 hours), midday (1500 hours), and late evening (2200 hours).

A 2-person crew conducted drifts usually 6 days per week with Sunday off. However, if drifts were missed because of weather or motor problems then drifts were sometimes made on Sunday. A minimum of 200 drifts is attempted in most years.

All test fishing drifts were approximately 20 minutes in duration using a 50-fathom gillnet. The net is made of 5<sup>7</sup>/<sub>8</sub> inch (14.9 cm) stretched mesh multifilament webbing, 40 meshes deep, and hung at a ratio of 2:1. Test fishing drifts were conducted from a 20-foot boat, powered by an 85-horsepower outboard motor. If catch rates were high, fishing time was reduced to control mortality. Inadvertently killed fish were made available to village elders and other individuals for subsistence purposes. The availability of these fish was announced over a 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 is the number of fish that would have been caught if 100 fathoms of gillnet 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 gillnet in fathoms, and

$t$  = mean fishing time in minutes

Mean fishing time ( $t$ ) is defined as the amount of time the entire gillnet is fished plus half the time it took to deploy and retrieve the net. Mean daily CPUE indices were calculated using the sum of the total time fished and total fish caught for each day. 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 and were used to estimate the midpoint of the chum salmon run past the test fishery site.

The 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 was 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 distributions are described as a percent since the number of drifts made at each site and the amount of time fished varied (Lingnau 1997).

## AGE, SEX, AND LENGTH

ASL data were collected from up to 20 chum salmon per day. Scales were collected from the left side of the fish approximately 2 rows above the lateral line in the area crossed by a diagonal from the posterior insertion of the dorsal fin to the anterior insertion of the anal fin (INPFC 1963). Scales were mounted on gum cards and impressions made on cellulose acetate cards with a heated hydraulic press (Clutter and Whitesel 1956). Salmon were measured to the nearest 0.5 cm from the middle of the eye to the tail fork (METF). The sex of each fish was determined from external characteristics (e.g., body symmetry, kype development, and presence of an ovipositor).

Salmon ages were determined by examining scales (Mosher 1968). European notation (e.g. 0.3; Koo 1962) was used to record ages; numerals preceding the decimal refer to number of freshwater annuli and numerals following the decimal refer to number of marine annuli. Total age from time of egg deposition or brood year is the sum of both numbers plus one year to account for incubation time.

## **ATMOSPHERIC AND HYDROLOGIC OBSERVATIONS**

Project personnel recorded standard environmental factors during project operations at 0800 hours. Water level, water temperature, air temperature and turbidity (determined by use of a secchi disk) were recorded daily at the site. Visual estimates of percentage of cloud cover were also recorded.

## **RESULTS**

### **KOBUK RIVER TEST FISHERY**

Test fishing began with the 2200 hours drifts on 9 July and continued through the 2200 drifts on 14 August. Drifting occurred 7 days a week except for the weeks beginning 13 and 20 July when Sunday was taken off by the crew. Chum salmon CPUE indices were calculated for each drift and site (Tables 1–2, Appendix A1) and compared graphically with other years (Figures 4 and 5). A total of 200 test fishery drifts were made for a cumulative chum salmon CPUE index of 2,268.79 (Tables 1–2, Figure 5).

There were 2,281 chum salmon, 5 pink salmon *O. gorbuscha*, 5 whitefish *Coregonus* spp., 2 longnose suckers *Catostomus catostomus*, and 880 *Inconnu* (sheefish) *Stenodus leucichthys* caught in 200 drifts. Cumulative chum salmon CPUE was 2,268.79 (Table 1, Figures 4–5, Appendix A1) and the distribution of chum salmon CPUE indices by site was 27.7% at site N and 72.3% at site S (Table 2). Distribution of CPUE indices by drift period was 34.5%, 31.6%, and 33.9% caught at 0800, 1500, and 2200 hour drifts, respectively (Table 2, Appendix A2). Peak catch and CPUE occurred on 26 July with a catch of 163 chum salmon, that resulted in a CPUE of 142.25 (Table 1).

A total of 542 chum salmon scales were aged from the test fishery catch samples. Test fishery sample data were separated into 5 strata. Females comprised the majority of samples in all strata, except for the second stratum. Overall, females comprised 56.8% of the season's chum salmon samples (Table 3). Age-0.4 chum salmon were the dominant age group observed during the first 3 strata and age-0.3 chum salmon were the dominant age group in the last 2 strata (Table 3). Seasonal age composition was 47.8% age-0.3, 44.6% age-0.4, 7.4% age-0.5 and 0.2% age-0.6 (Table 3; Appendix B1). Comparisons of mean lengths during the season indicated that males were larger than females (Table 3, Appendix B2).

### **NOATAK RIVER TEST FISHERY**

Drift test fishing was conducted on 5 August and 13 August on the Noatak River to compare chum salmon ASL composition and a total of 177 samples were aged. Noatak River age composition was 0.6% age-0.2, 72.9% age-0.3, 20.3% age-0.4 and 6.2% age-0.5 (Table 4, Appendix B3). Females comprised 44.1% of the catch and average length for females was 594.1 mm, whereas males averaged 610.2 mm in length. (Table 4, Appendices B3–B4).

## **KOTZEBUE SOUND COMMERCIAL FISHERY SAMPLING**

There were 1,181 chum salmon scales aged from the commercial catch samples in 2008. Commercial catch samples were separated into 6 sampling strata. Females were 54.2% of the catch samples and the commercial chum salmon samples age composition was 0.2% age-0.2, 68.2% age-0.3, 24.3% age-0.4 and 7.3% age-0.5 (Table 5; Appendix B5). Average lengths of commercial catch samples were 609.5 mm for males and 589.1 mm for females.

## **SHEEFISH CATCH STATISTICS**

Cumulative sheefish CPUE indices were also calculated for each drift and site at the Kobuk River test fishery project. Overall, CPUE was 821.73 in 2008 (Table 6, Figures 6–7, Appendix C1). Percentages of the mean CPUE by drift site and period were 33.8% at site N and 66.2% at site S, and 29.7%, 35.2%, and 35.1% of the CPUE occurred during the 0800, 1500, and 2200 hours drifts, respectively (Table 7; Appendix C2). The sheefish peak catch occurred on 27 July with a catch of 70 sheefish, and the peak daily CPUE of 68.28 occurred on 18 July (Table 6, Appendix C1).

## **ATMOSPHERIC AND HYDROLOGIC OBSERVATIONS**

Stream observations indicated water temperatures fluctuated between 9 and 19°C during the 2008 season. Water levels fell throughout the sampling period from 29.5 inches on 10 July to 7 inches on 14 August. Water clarity from Secchi disk readings ranged from 3 to 4 m during the season (Table 8).

## **DISCUSSION**

The 2008 test fishery drifts were the fifth lowest out of 16 years, but the cumulative CPUE index of 2,268.79 was the second highest on record (Figure 5, Appendix A3). A near-record chum salmon test fishery index was consistent with the 2008 commercial chum salmon catch, the second highest in the last decade (Appendix A5).

The midpoint of the Kobuk River chum salmon test fishery CPUE occurred on 30 July, which was the third earliest date in the 16-year history of the project (Figure 4, Appendix A4). Of the 3 drift periods each day, the 0800 hours drifts had the highest CPUE during the 2008 season compared to the 1500 hours or 2200 hours drifts. The 0800 drift has had the highest CPUE in 8 out of 16 seasons (Appendix A2). As in all previous years, except 2007, the majority of the chum catches occurred at the south bank site. Except for 2005 and 2007, chum salmon catches at the south bank site have represented over 60% of the total test fishery catch each year.

Test fishing with gillnets results in some selectivity of the size of the fish captured. However, using the same type of net, mesh size, and fishing methodology each year allows for comparisons of ASL composition among years. The 2008 chum salmon test fishery catch samples had the sixth highest percentage of age-0.4 and age-0.5 fish combined (Appendix B1). In 2006, there was a record percentage of age-0.2 fish in the test fishery suggesting there was a good survival rate for individuals from the 2003 brood year. Likewise in 2007, age-0.3 fish showed good survival and comprised a majority of the age structure and ranked fourth overall for age-0.3 fish caught at the test net site. This was the first year in which no age-0.2 fish were observed in the test fishery.

The Kobuk River chum salmon test fishery ASL data were consistent with the age composition observed in the Kotzebue Sound commercial fishery and the Noatak River test fishery samples. More specifically, age-0.3 chum salmon represented nearly half of the samples and the percentage of age-0.2 chum salmon was near zero. The 68.2% age-0.3 samples in the commercial chum salmon catch and 72.9% age-0.3 observed in the Noatak River test fishery samples were the third and fourth highest observed since 1993, respectively. Similarly, the 20.3% age-0.4 in the Noatak River samples (Appendix B3) and 24.3% age-0.4 in the commercial samples (Appendix B5) were the third lowest since 1993.

The 2008 Noatak River test fishery catch samples had the fourth highest percentage (73%) of age-0.3 chum salmon in the last 16 years (Appendix B3). However, Noatak samples were only taken from 2 days of test fishing and the age composition may have been skewed. Nevertheless, taken collectively, the age data from all 3 sample sources indicate that the 2004 brood year experienced relatively good survival conditions. Chum salmon runs to Kotzebue Sound drainages in 2009 should therefore have a strong contribution from age-0.4 fish returning from the 2004 brood year. The 2009 run should be sufficient to support customary subsistence use and commercial harvests based on the magnitude and age composition of the 2008 run. Lengths from Noatak and Kobuk River test fishery samples and Kotzebue Sound commercial catches in 2008 were compared to previous years and were found to be similar (Appendices B2, B4, and B6).

The cumulative sheefish CPUE index of 821.73 in 2008 was the highest recorded in the 11 years that sheefish have been sampled (Table 6, Figure 7, and Appendix C3). Historically, the highest mean daily CPUE for sheefish occurs within the first few days after test fishing begins, although the sheefish run is usually at its midpoint during the first or second week of July. In 2008, the midpoint occurred on 19 July (Table 6, Figure 6, and Appendix C4). The project is designed to index the chum salmon run and test fishing starts early in the chum run, but usually at the midpoint of the sheefish run. For example, in the first 3 days of test fishing in 2006, 7 chum salmon and 198 sheefish were caught, and those numbers represented approximately 0.1% of the season's chum salmon catch and 24% of the sheefish catch. In 2008, the first quarter point for sheefish catches was not reached until after 6 days of test fishing.

Historical distribution of sheefish CPUE by test fishery site and time is presented in Appendix C2. Most of the sheefish were caught on the south bank in 2008 with 66.2% being caught at the South site. In all years that sheefish catches have been recorded, the majority of the catches have been at the South site. The 2200 drifts had the highest sheefish CPUE compared to 0800 and 1500 drifts. This result differed from the chum salmon CPUE that had the highest CPUE during the 0800 drifts.

An unusually dry August may have been the reason why the lowest reading on the water level gauge occurred on the last day of drift net sampling. The gauge was initially set at 29.5 inches on 10 July and the lowest reading was on 14 August when the water level was 7.0 inches (Table 8). Water levels cannot be compared among years as the gauge is arbitrarily set near the river edge each year at the beginning of the project.

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## **TABLES**

Table 1.–Kobuk River test fishery chum salmon CPUE by day, drift, and site, 2008.

Date	CPUE by Drift <sup>a</sup>			CPUE by Site <sup>b</sup>		Daily	Cum.
	#1 <sup>c</sup>	#2	#3	N	S	CPUE	CPUE
9 Jul			0.00	0.00	0.00	0.00	0.00
10 Jul	0.00	2.64	10.26	9.38	1.40	4.82	4.82
11 Jul	0.00	9.41	2.18	1.58	6.71	4.07	8.89
12 Jul	8.57	10.91	4.40	3.08	12.34	7.98	16.87
13 Jul							<sup>d</sup> 16.87
14 Jul	11.01	16.55	2.07	2.96	16.09	9.85	26.72
15 Jul	24.22	12.74	32.82	1.60	40.63	23.36	50.08
16 Jul	8.28	50.23	13.48	3.78	36.59	22.27	72.35
17 Jul	32.00	43.64	99.00	6.10	99.43	56.74	129.09
18 Jul	13.64	114.55	49.52	10.00	110.92	60.25	189.34
19 Jul	89.23	151.38	81.70	51.61	163.30	108.63	297.97
20 Jul							<sup>d</sup> 297.97
21 Jul	99.80	62.73	125.07	59.10	131.43	94.15	392.12
22 Jul	0.00	100.00	53.62	23.76	101.28	64.00	456.12
23 Jul	34.70	33.55	67.20	17.78	73.19	46.09	502.21
24 Jul	114.78	113.55	91.03	23.04	177.96	106.76	608.97
25 Jul	68.15	138.46	78.14	40.65	148.76	94.04	703.01
26 Jul	104.35	100.00	213.33	72.38	201.34	142.25	845.26
27 Jul	60.00	19.31	80.96	26.67	79.35	52.80	898.06
28 Jul	77.04	110.27	92.53	21.05	158.71	92.77	990.83
29 Jul	108.84	116.67	145.71	48.00	187.27	123.97	1114.80
30 Jul	129.47	86.29	54.40	4.00	176.00	90.00	1204.80
31 Jul	75.95	77.14	107.59	39.07	138.84	87.36	1292.16
1 Aug	157.58	45.41	195.35	21.64	241.75	138.07	1430.23
2 Aug	141.33	32.43	45.57	61.49	92.46	77.04	1507.27
3 Aug	91.69	17.91	30.00	20.00	80.69	49.83	1557.10
4 Aug	98.67	70.59	32.43	55.86	81.20	69.40	1626.50
5 Aug	116.29	26.30	16.44	70.48	47.18	59.26	1685.76
6 Aug	93.47			67.83	117.55	93.47	1779.23
7 Aug		44.21	88.89	31.58	100.74	67.26	1846.49
8 Aug	77.84	36.46	127.85	75.69	96.00	85.85	1932.34
9 Aug	36.92	6.49	60.72	24.44	45.35	35.74	1968.08
10 Aug	55.61	12.12	17.91	36.92	21.67	28.06	1996.14
11 Aug	96.00	57.60	3.81	58.95	53.95	56.30	2052.44
12 Aug	16.22	126.06	81.70	97.71	60.47	80.00	2132.44
13 Aug	104.00	111.84	76.52	94.79	104.06	99.85	2232.29
14 Aug	35.20	42.74	31.30	55.20	20.51	36.50	2268.79
Total	2180.85	2000.18	2213.50	1238.17	3225.12	2268.79	

Note: Blank cells indicate no data.

<sup>a</sup> Catch per unit of effort (CPUE) is calculated in catch/100 fathoms of net/hour.

<sup>b</sup> Site N is the North Bank (right bank when facing downstream) and Site S is the South Bank (left bank).

<sup>c</sup> Drift 1 begins at 0800, Drift 2 at 1500, and Drift 3 at 2200.

<sup>d</sup> Drift did not occur.

Table 2.–Kobuk River test fishery chum salmon CPUE indices, mean CPUE and percent by drift and site, 2008.

Drift Period	Season CPUE Indices	No. of Period Drifts <sup>a</sup>	Season Mean CPUE	Percent	Station	Season CPUE Indices	No. of Site Drifts	Season Mean CPUE	Percent
1 0800 hr.	2180.85	33	66.09	34.46	N North Bank	1238.17	100	12.38	27.74
2 1500 hr.	2000.18	33	60.61	31.60	S South Bank	3225.12	100	32.25	72.26
3 2200 hr.	2213.50	34	65.10	33.94					
Total	6394.53	100		100.00	Total	4463.29	200		100.00

<sup>a</sup> One drift period is equal to one test fishery drift on the north bank and one test fishery drift on the south bank.

Table 3.–Kobuk River test fishery chum salmon age, sex, and mean length (METF in mm), Kobuk River, Kotzebue Sound, 2008.

		Brood Year and (Age Group)				Total
		2004	2003	2002	2001	
		(0.3)	(0.4)	(0.5)	(0.6)	
Sampling Dates:	7/10-7/19	Stratum 1				
Sample Size:	150					
Male	Percent of Catch	18.0	33.3	3.3		54.7
	Mean Length (mm)	617.3	627.5	623.0		623.8
	Number of Samples	27	50	5		82
Female	Percent of Catch	15.3	26.7	3.3		45.3
	Mean Length (mm)	603.5	614.5	623.0		612.1
	Number of Samples	23	40	5		68
Total	Percent of Catch	33.3	60.0	6.7		100.0
	Mean Length (mm)	610.9	621.7	623.0		618.2
	Number of Samples	50	90	10		150
Sampling Dates:	7/21-7/26	Stratum 2				
Sample Size:	112					
Male	Percent of Catch	15.2	21.4	2.7		39.3
	Mean Length (mm)	626.2	636.9	615.0		631.3
	Number of Samples	17	24	3		44
Female	Percent of Catch	25.9	29.5	5.4		60.7
	Mean Length (mm)	601.0	606.4	605.8		604.0
	Number of Samples	29	33	6		68
Total	Percent of Catch	41.1	50.9	8.0		100.0
	Mean Length (mm)	610.3	619.2	608.9		614.7
	Number of Samples	46	57	9		112
Sampling Dates:	7/28-8/02	Stratum 3				
Sample Size:	94					
Male	Percent of Catch	19.1	33.0	5.3	1.1	58.5
	Mean Length (mm)	629.2	649.8	652.0	630.0	642.9
	Number of Samples	18	31	5	1	55
Female	Percent of Catch	20.2	13.8	7.4		41.5
	Mean Length (mm)	595.5	600.8	614.3		600.6
	Number of Samples	19	13	7		39
Total	Percent of Catch	39.4	46.8	12.8	1.1	100.0
	Mean Length (mm)	611.9	635.3	630.0	630.0	625.4
	Number of Samples	37	44	12	1	94

-continued-

Table 3.–Page 2 of 2.

		Brood Year and (Age Group)				
		2004	2003	2002	2001	Total
		(0.3)	(0.4)	(0.5)	(0.6)	
Sampling Dates:	8/04-8/10					
Sample Size:	119					
		Stratum 4				
Male	Percent of Catch	21.0	8.4	1.7		31.1
	Mean Length (mm)	608.4	625.5	622.5		613.8
	Number of Samples	25	10	2		37
Female	Percent of Catch	42.0	25.2	1.7		68.9
	Mean Length (mm)	594.0	589.8	587.5		592.3
	Number of Samples	50	30	2		82
Total	Percent of Catch	63.0	33.6	3.4		100.0
	Mean Length (mm)	598.8	598.8	605.0		599.0
	Number of Samples	75	40	4		119
Sampling Dates:	8/11-8/14					
Sample Size:	67					
		Stratum 5				
Male	Percent of Catch	16.4	4.5	3.0		23.9
	Mean Length (mm)	594.1	605.0	575.0		593.8
	Number of Samples	11	3	2		16
Female	Percent of Catch	59.7	11.9	4.5		76.1
	Mean Length (mm)	599.1	593.8	571.7		596.7
	Number of Samples	40	8	3		51
Total	Percent of Catch	76.1	16.4	7.5		100.0
	Mean Length (mm)	598.0	596.8	573.0		596.0
	Number of Samples	51	11	5		67
Sampling Dates:	7/10-8/14					
Sample Size:	542					
		Season Total				
Male	Percent of Catch	18.1	21.8	3.1	0.2	43.2
	Mean Length (mm)	616.1	634.5	624.4	630.0	626.1
	Number of Samples	98	118	17	1	234
Female	Percent of Catch	29.7	22.9	4.2		56.8
	Mean Length (mm)	598.1	603.6	606.1		600.9
	Number of Samples	161	124	23		308
Total	Percent of Catch	47.8	44.6	7.4	0.2	100.0
	Mean Length (mm)	604.9	618.7	613.9	630.0	611.8
	Number of Samples	259	242	40	1	542

Note: Blank cells indicate no data.

Table 4.—Noatak River test fishery chum salmon age, sex, and mean length (METF in mm) composition, Kotzebue Sound, 2008.

		Brood Year and (Age Group)				
		<u>2005</u>	<u>2004</u>	<u>2003</u>	<u>2002</u>	
		(0.2)	(0.3)	(0.4)	(0.5)	Total
Sampling Date:	8/5-8/13					
Sample Size:	177					
Male	Percent of Catch	0.6	40.1	10.7	4.5	55.9
	Mean Length (mm)	625.0	602.3	627.6	637.5	610.2
	Number of Samples	1	71	19	8	99
Female	Percent of Catch		32.8	9.6	1.7	44.1
	Mean Length (mm)		593.4	598.5	581.7	594.1
	Number of Samples		58	17	3	78
Total	Percent of Catch	0.6	72.9	20.3	6.2	100.0
	Mean Length (mm)	625.0	598.3	613.9	622.3	603.1
	Number of Samples	1	129	36	11	177

Table 5.—Commercial chum salmon catch sample age, sex, and mean length (METF in mm) composition, Kotzebue Sound, 2008.

		Brood Year and (Age Group)				
		2005	2004	2003	2002	Total
		(0.2)	(0.3)	(0.4)	(0.5)	
Sampling Dates:	7/21-7/25					
Sample Size:	278	Stratum 1				
Male	Percent of Samples		26.6	13.3	4.7	44.6
	Mean Length (mm)		610.4	612.6	635.0	613.6
	Number of Samples		74	37	13	124
Female	Percent of Samples		32.0	17.6	5.8	55.4
	Mean Length (mm)		588.6	601.4	606.3	594.4
	Number of Samples		89	49	16	154
Total	Percent of Samples		58.6	30.9	10.4	100.0
	Mean Length (mm)		598.5	606.2	619.1	603.2
	Number of Samples		163	86	29	278
Sampling Dates:	7/28-8/01					
Sample Size:	239	Stratum 2				
Male	Percent of Samples	0.4	32.6	7.9	7.1	48.1
	Mean Length (mm)	555.0	607.6	623.8	638.5	614.4
	Number of Samples	1	78	19	17	115
Female	Percent of Samples		29.3	18.8	3.8	51.9
	Mean Length (mm)		590.8	601.7	602.2	595.4
	Number of Samples		70	45	9	124
Total	Percent of Samples	0.4	61.9	26.8	10.9	100.0
	Mean Length (mm)	555.0	599.6	608.3	626.0	604.5
	Number of Samples	1	148	64	26	239
Sampling Dates:	8/06					
Sample Size:	157	Stratum 3				
Male	Percent of Samples		30.6	15.3	5.1	51.0
	Mean Length (mm)		606.6	629.0	625.6	615.2
	Number of Samples		48	24	8	80
Female	Percent of Samples		31.8	12.7	4.5	49.0
	Mean Length (mm)		582.2	593.5	602.9	587.5
	Number of Samples		50	20	7	77
Total	Percent of Samples		62.4	28.0	9.6	100.0
	Mean Length (mm)		594.1	612.8	615.0	601.4
	Number of Samples		98	44	15	157

-continued-

Table 5.–Page 2 of 3.

		Brood Year and (Age Group)				
		2005	2004	2003	2002	Total
		(0.2)	(0.3)	(0.4)	(0.5)	
Sampling Dates:	8/14	Stratum 4				
Sample Size:	80					
Male	Percent of Samples		32.5	8.8	0.0	41.3
	Mean Length (mm)		587.9	586.4	0.0	587.6
	Number of Samples		26	7	0	33
Female	Percent of Samples		46.3	10.0	2.5	58.8
	Mean Length (mm)		572.3	575.6	587.5	573.5
	Number of Samples		37	8	2	47
Total	Percent of Samples		78.8	18.8	2.5	100.0
	Mean Length (mm)		578.7	579.3	587.5	579.3
	Number of Samples		63	15	2	80
Sampling Dates:	8/18-8/20	Stratum 5				
Sample Size:	351					
Male	Percent of Samples	0.3	33.3	8.5	1.4	43.6
	Mean Length (mm)	520.0	606.8	615.9	602.0	607.8
	Number of Samples	1	117	30	5	153
Female	Percent of Samples		44.2	10.5	1.7	56.4
	Mean Length (mm)		582.8	597.8	587.5	585.7
	Number of Samples		155	37	6	198
Total	Percent of Samples	0.3	77.5	19.1	3.1	100.0
	Mean Length (mm)	520.0	593.1	605.9	594.1	595.3
	Number of Samples	1	272	67	11	351
Sampling Dates:	8/25	Stratum 6				
Sample Size:	76					
Male	Percent of Samples		38.2	6.6	2.6	47.4
	Mean Length (mm)		592.8	593.0	615.0	594.0
	Number of Samples		29	5	2	36
Female	Percent of Samples		43.4	7.9	1.3	52.6
	Mean Length (mm)		581.8	607.5	615.0	586.5
	Number of Samples		33	6	1	40
Total	Percent of Samples		81.6	14.5	3.9	100.0
	Mean Length (mm)		586.9	600.9	615.0	590.1
	Number of Samples		62	11	3	76

-continued-

Table 5.–Page 3 of 3.

		Brood Year and (Age Group)				
		2005	2004	2003	2002	Total
		(0.2)	(0.3)	(0.4)	(0.5)	
Sampling Dates:	7/21-8/25					
Sample Size:	1181					Season Total
Male	Percent of Samples	0.2	31.5	10.3	3.8	45.8
	Mean Length (mm)	537.5	605.2	616.1	630.1	609.5
	Number of Samples	2	372	122	45	541
Female	Percent of Samples		36.7	14.0	3.5	54.2
	Mean Length (mm)		584.2	598.7	601.3	589.1
	Number of Samples		434	165	41	640
Total	Percent of Samples	0.2	68.2	24.3	7.3	100.0
	Mean Length (mm)	537.5	593.9	606.1	616.4	598.4
	Number of Samples	2	806	287	86	1181

*Note:* Blank cells indicate no data.

Table 6.–Kobuk River test fishery sheefish CPUE by day, drift, and site 2008.

Date	CPUE by Drift <sup>a</sup>			CPUE by Site <sup>b</sup>		Daily CPUE	Cum. CPUE
	#1 <sup>c</sup>	#2	#3	N	S		
9 Jul			34.70	40.85	26.67	34.70	34.70
10 Jul	18.46	31.65	32.82	16.88	36.49	28.09	62.79
11 Jul	37.59	51.76	39.27	55.26	30.21	43.12	105.91
12 Jul	57.86	39.27	41.83	35.38	56.23	46.40	152.31
13 Jul							<sup>d</sup> 152.31
14 Jul	26.42	53.79	55.86	28.25	61.68	45.75	198.06
15 Jul	26.42	38.23	28.72	16.00	43.17	31.15	229.21
16 Jul	37.24	25.12	35.06	32.13	33.66	32.99	262.20
17 Jul	66.67	76.36	48.00	54.92	72.00	64.19	326.39
18 Jul	79.09	62.73	60.95	40.00	96.81	68.28	394.67
19 Jul	52.31	14.77	25.53	15.48	49.48	32.84	427.51
20 Jul							<sup>d</sup> 427.51
21 Jul	9.50	19.09	6.76	3.58	20.95	12.00	439.51
22 Jul	0.00	20.00	40.85	9.50	41.83	26.29	465.80
23 Jul	34.70	49.03	50.40	39.11	51.06	45.22	511.02
24 Jul	36.52	33.55	46.90	40.32	37.55	38.82	549.84
25 Jul	32.59	27.69	58.60	23.23	57.52	40.16	590.00
26 Jul	41.74	45.71	16.97	7.62	56.38	34.04	624.04
27 Jul	51.00	99.31	49.16	19.05	116.13	67.20	691.24
28 Jul	5.93	32.43	37.59	4.21	44.52	25.21	716.45
29 Jul	27.91	20.00	11.43	4.36	32.73	19.83	736.28
30 Jul	15.79	13.48	38.40	8.00	36.00	22.00	758.28
31 Jul	15.19	28.57	8.28	3.72	31.74	17.28	775.56
1 Aug	2.42	19.46	2.79	0.00	14.01	7.41	782.97
2 Aug	5.33	0.00	3.04	3.97	1.97	2.96	785.93
3 Aug	5.39	3.58	21.00	14.00	6.21	10.17	796.10
4 Aug	10.67	2.82	42.16	20.69	14.44	17.35	813.45
5 Aug	0.00	3.29	6.58	3.81	2.05	2.96	816.41
6 Aug	0.00			0.00	0.00	0.00	816.41
7 Aug	0.00	0.00	2.96	0.00	2.96	1.53	817.94
8 Aug		9.11	0.00	5.54	0.00	2.77	820.71
9 Aug	0.00	3.24	0.00	2.22	0.00	1.02	821.73
10 Aug	0.00	0.00	0.00	0.00	0.00	0.00	821.73
11 Aug	0.00	0.00	0.00	0.00	0.00	0.00	821.73
12 Aug	0.00	0.00	0.00	0.00	0.00	0.00	821.73
13 Aug	0.00	0.00	0.00	0.00	0.00	0.00	821.73
14 Aug	0.00	0.00	0.00	0.00	0.00	0.00	821.73
Total	696.74	824.04	846.61	548.08	1074.45	821.73	

Note: Blank cells indicate no data.

<sup>a</sup> Catch per unit of effort is calculated in catch/100 fathoms of net/hour

<sup>b</sup> Site N is the North Bank (right bank when facing downstream) and Site S is the South Bank (left bank).

<sup>c</sup> Drift 1 begins at 0800, Drift 2 at 1500, and Drift 3 at 2200.

<sup>d</sup> Regular day off.

Table 7.–Kobuk River test fishery sheefish CPUE indices, mean CPUE and percent by drift and site, 2008.

Drift Period	Season CPUE Indices	No. of Period Drifts <sup>a</sup>	Season Mean CPUE	Percent	Station	Season CPUE Indices	No. of Site Drifts	Season Mean CPUE	Percent
1 0800 hr.	696.74	33	21.11	29.74	N North Bank	548.08	100	5.48	33.78
2 1500 hr.	824.04	33	24.97	35.18	S South Bank	1074.45	100	10.74	66.22
3 2200 hr.	846.61	34	24.90	35.08					
Total	2367.39	100		100.00	Total	1622.53	200		100.00

<sup>a</sup> One drift period is equal to one test fish drift on the north bank and one test fish drift on the south bank.

Table 8.–Kobuk River atmospheric and hydrologic data, 2008.

Date	Water Temp. (C)	Water Gauge (inches)	Secchi (meters)	Air Temp. (C)	Percent Cloud Cover
10 Jul	16.8	29.5 <sup>a</sup>	3.00	12.00	100
11 Jul	16.8	22.5	4.00	13.00	30
12 Jul	16.0	21.0	3.00	11.00	100
13 Jul					
14 Jul	14.0	20.5	3.50	16.00	40
15 Jul	19.0	22.0	3.50	17.00	100
16 Jul	18.0	21.5	3.00	15.00	100
17 Jul	14.0	22.0	3.50	13.00	75
18 Jul	13.0	25.8	3.00	11.00	100
19 Jul	13.0	31.5	3.00	6.00	80
20 Jul					
21 Jul	12.0	38.5	3.50	4.00	20
22 Jul	12.0	38.0	3.50	6.00	80
23 Jul	11.0	41.0	3.50	7.00	0
24 Jul	11.0	39.0	4.00	8.00	100
25 Jul	12.0	37.5	3.00	9.00	60
26 Jul	12.0	36.5	3.00	9.00	100
27 Jul	11.0	33.5	3.50	6.00	100
28 Jul	12.0	30.5	3.50	7.00	80
29 Jul	11.0	37.5	4.00	9.00	100
30 Jul	11.0	28.5	3.50	5.00	80
31 Jul	11.0	28.0	3.50	6.00	100
1 Aug	11.0	27.0	4.00	9.00	100
2 Aug	9.0	29.0	3.50	4.00	50
3 Aug	9.8	29.2	4.00	6.00	100
4 Aug	10.0	30.0	4.00	7.00	95
5 Aug	9.0	30.0	3.50	6.00	100
6 Aug	10.0		4.00	14.00	5
7 Aug	11.0	20.0	4.00	21.00	20
8 Aug	11.0	20.0	4.00	14.00	0
9 Aug	11.5	18.0	4.00	14.00	80
10 Aug	11.0	15.0	4.00	8.00	60
11 Aug	12.0	13.0	4.00	11.00	100
12 Aug					100
13 Aug	11.0	9.0	4.00	13.00	75
14 Aug	12.0	7.0	4.00	10.00	100

Note: Blank cells indicate no data.

<sup>a</sup> Indicates the depth at which stream gauge was set.

## **FIGURES**

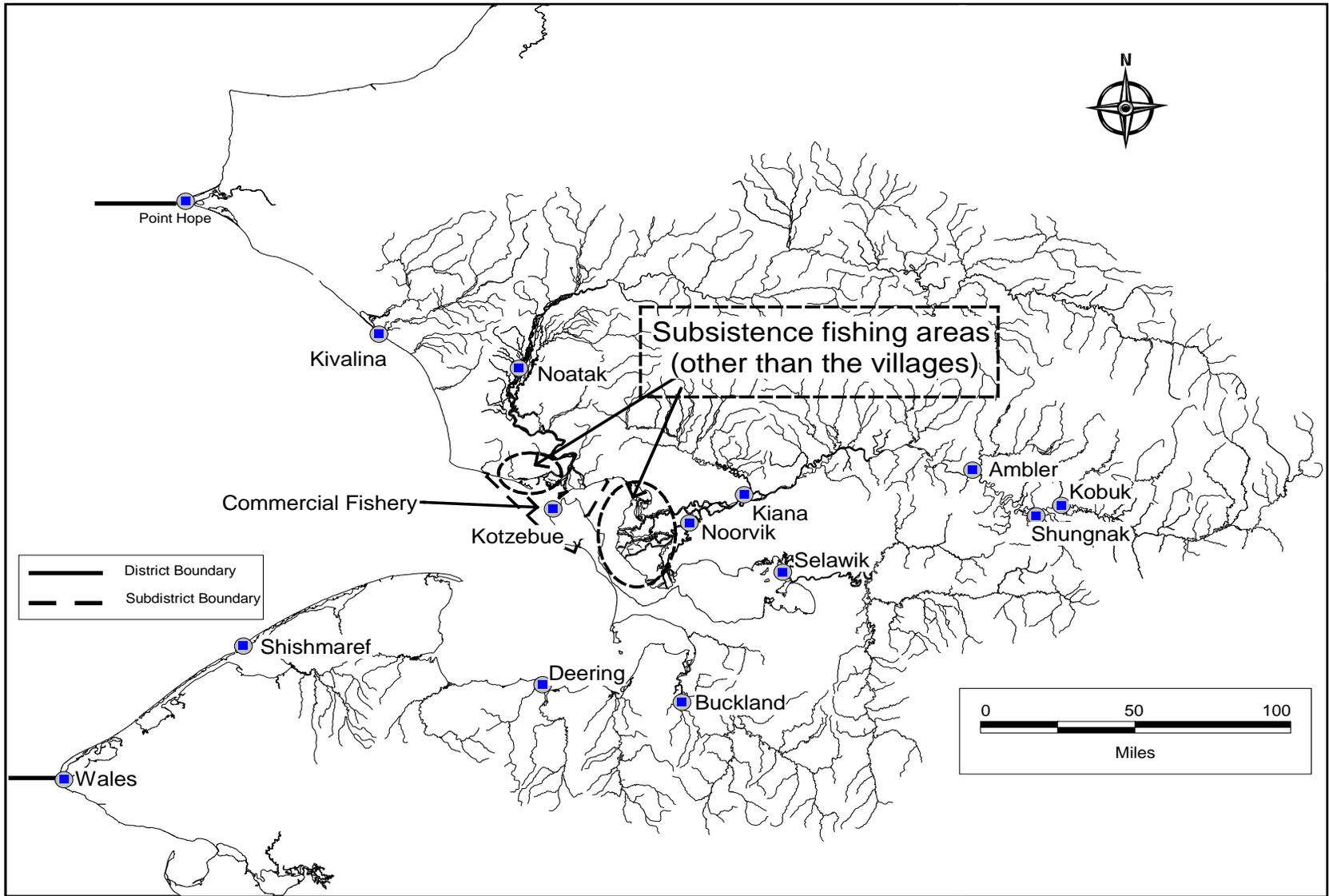


Figure 1.—Kotzebue Sound commercial fishing district, villages and subsistence fishing areas.

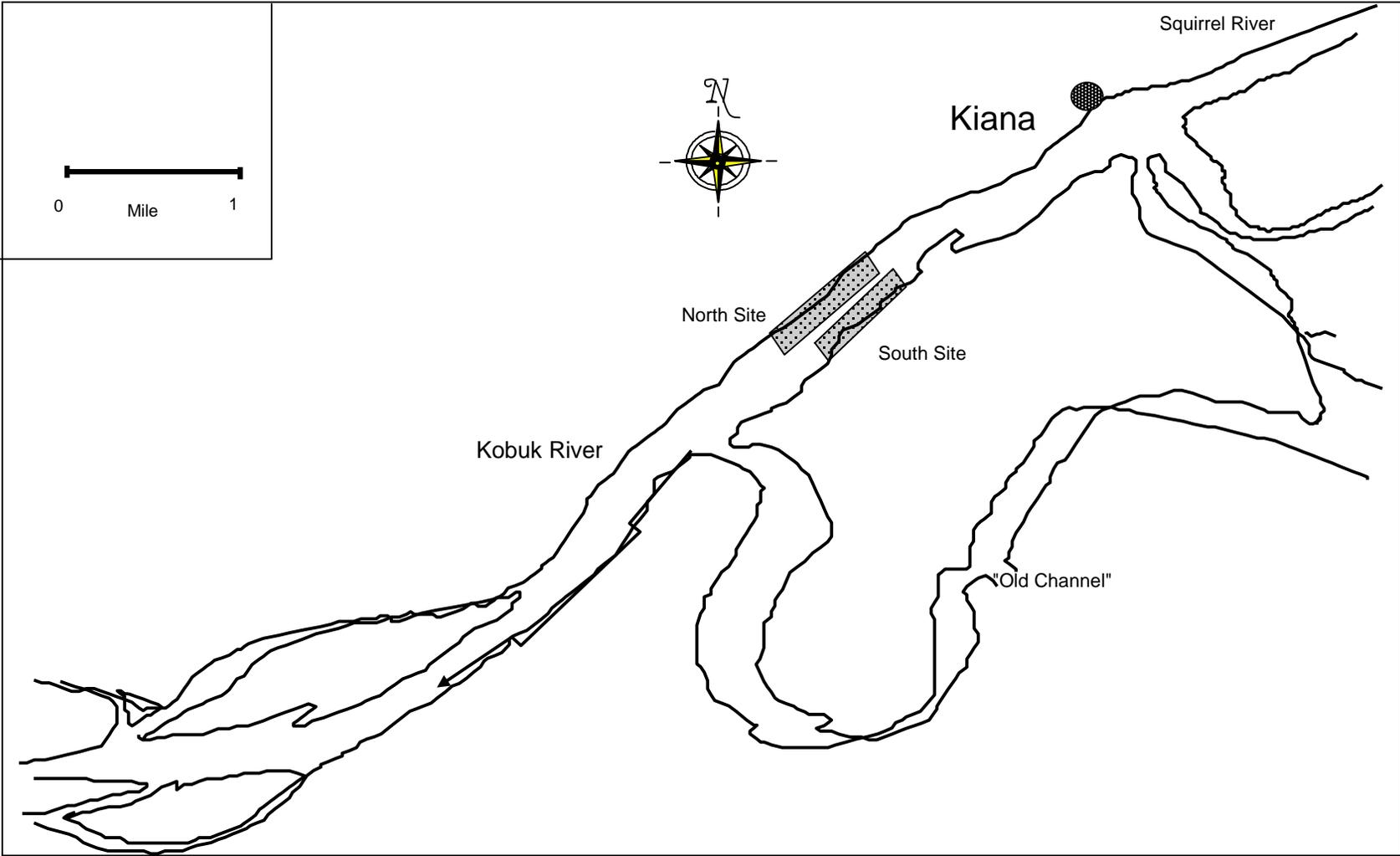


Figure 2.—Kobuk River test fishing sites.

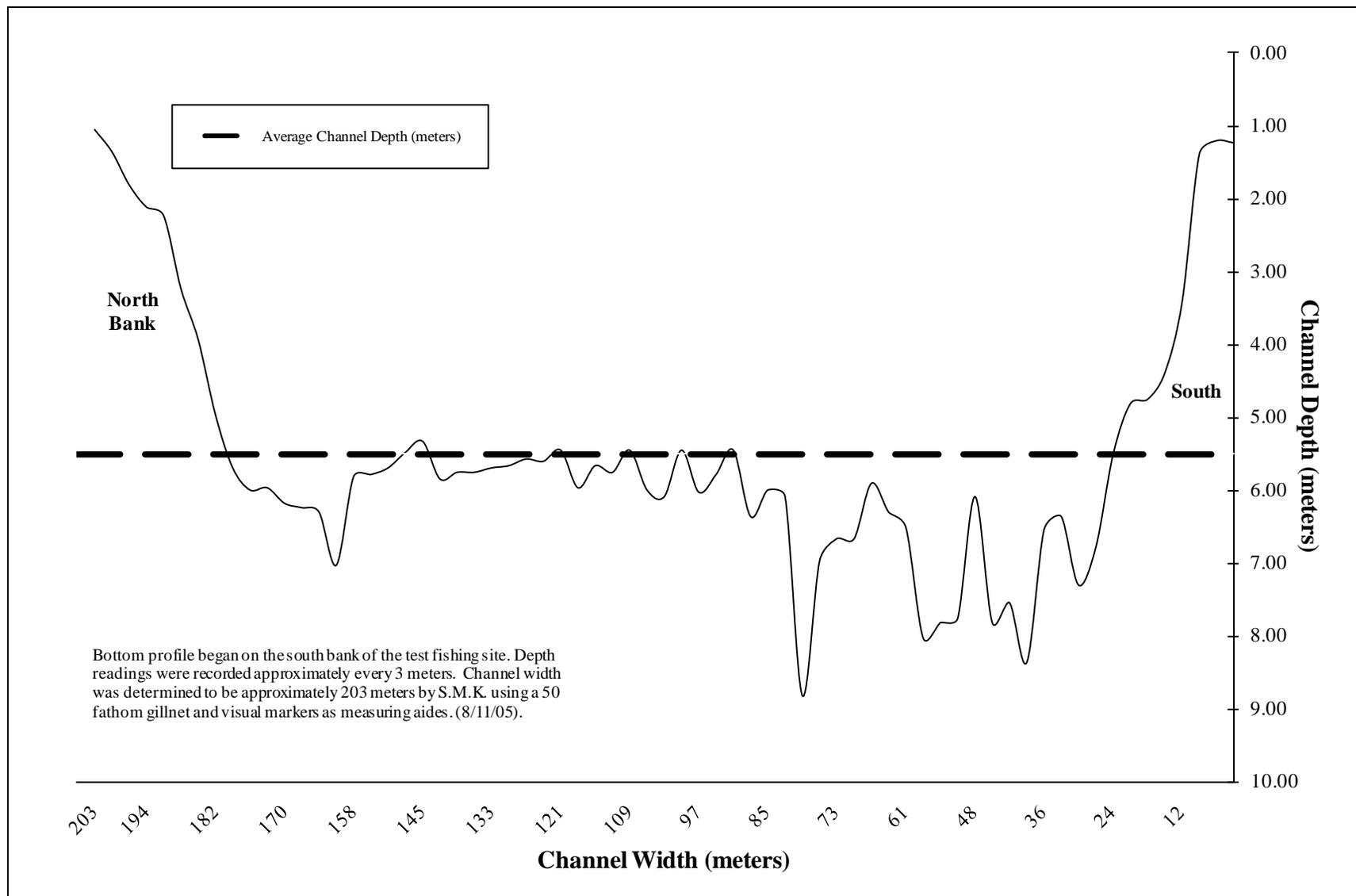


Figure 3.—Kobuk River test fishing site bottom profile.

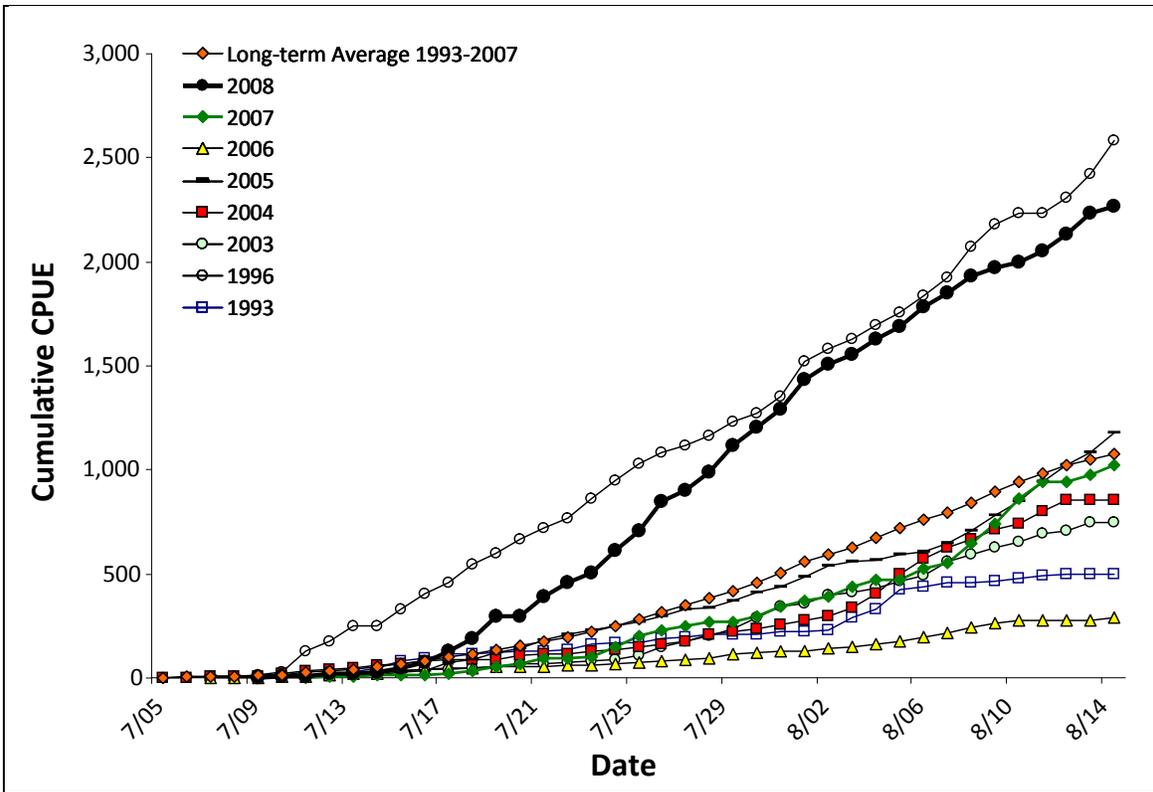


Figure 4.—Kobuk River chum salmon drift test fishery cumulative CPUE by date and historical long-term averages, 1993–2008.

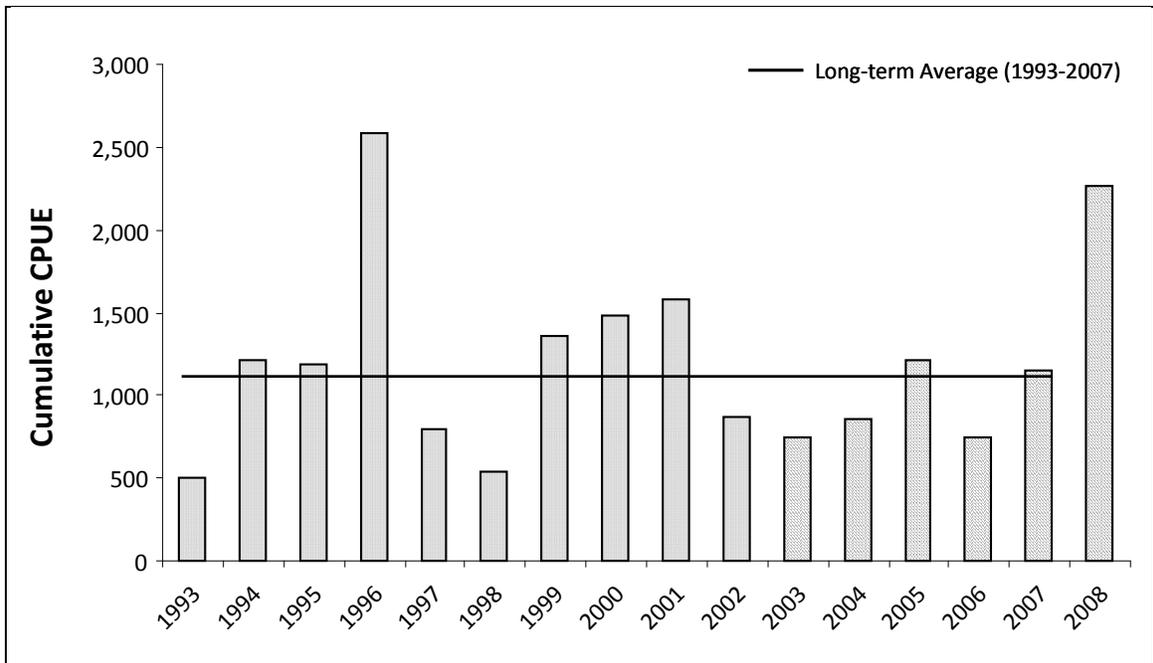


Figure 5.—Kobuk River chum salmon drift test fishery annual CPUE and historical long-term averages, 1993–2008.

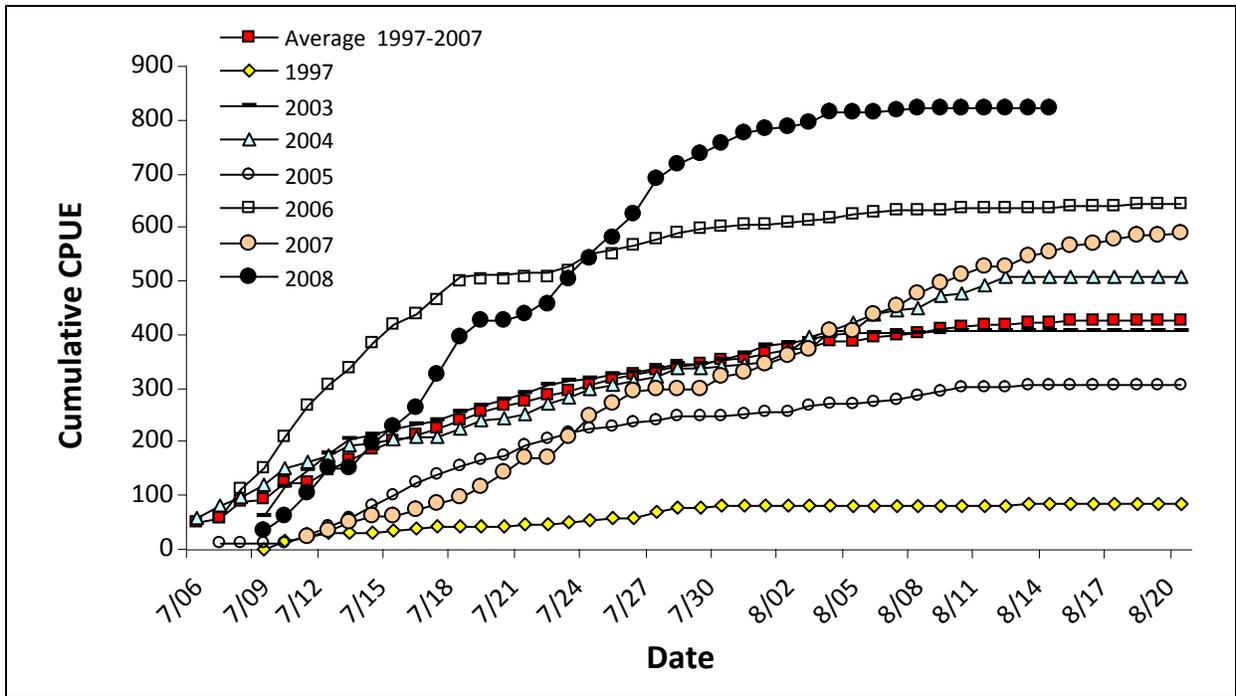


Figure 6.—Kobuk River sheefish drift test fishery cumulative CPUE by date, 1997, 1999–2008.

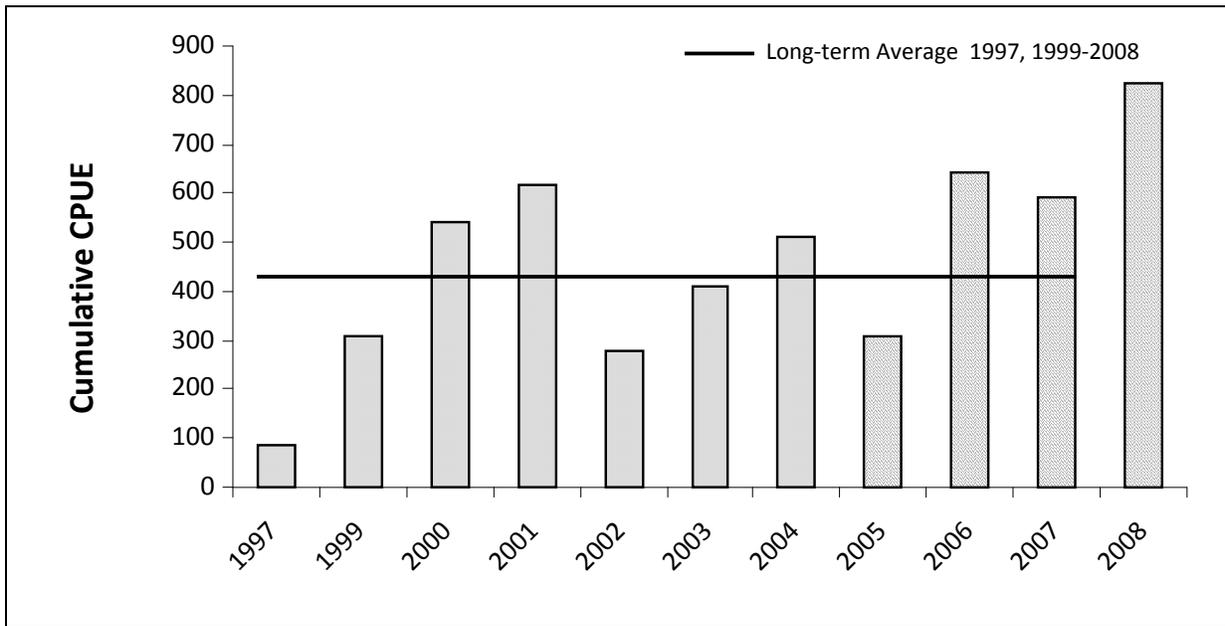


Figure 7.—Kobuk River sheefish drift test fishery annual CPUE and historical long-term average, 1997, 1999–2008.

## **APPENDIX A. CATCH AND CPUE**

Appendix A1.–Kobuk River chum salmon test fishery mean daily and cumulative CPUE, 1993–2008.

Date	1993		1994		1995		1996		1997	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
9 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	1028.01	21.57	178.83
26 Jul	15.22	185.13	47.65	129.20	35.15	248.57	55.68	1083.69	14.66	193.49
27 Jul	8.06	193.19	40.66	169.86	63.94	312.51	29.79	1113.48	18.46	211.95
28 Jul	16.36	209.55	57.83	227.69	62.49	375.00	49.06	1162.54	30.53	242.48
29 Jul	0.93	210.48	33.62	261.31	46.11	421.11	70.13	1232.67	28.13	270.61
30 Jul	0.92	211.40	69.21	330.52	57.86	478.97	35.29	1267.96	22.33	292.94
31 Jul	12.58	223.98	a	330.52	29.89	508.86	82.27	1350.23	32.57	325.51
1 Aug	a	223.98	82.16	412.68	72.91	581.77	167.67	1517.90	41.41	366.92
2 Aug	6.74	230.72	65.12	477.80	48.71	630.48	62.02	1579.92	22.41	389.33
3 Aug	57.08	287.80	71.79	549.59	48.40	678.88	48.70	1628.62	35.21	424.54
4 Aug	44.23	332.03	108.98	658.57	53.00	731.88	65.93	1694.55	26.67	451.21
5 Aug	89.30	421.33	59.74	718.31	49.95	781.83	60.33	1754.88	24.47	475.68
6 Aug	18.60	439.93	102.56	820.87	a	781.83	80.47	1835.35	42.25	517.93
7 Aug	20.52	460.45	a	820.87	46.39	828.22	90.99	1926.34	36.00	553.93
8 Aug	a	460.45	62.75	883.62	44.02	872.24	146.94	2073.28	45.07	599.00
9 Aug	1.84	462.29	96.86	980.48	68.22	940.46	106.11	2179.39	55.14	654.14
10 Aug	12.63	474.92	45.83	1026.31	56.33	996.79	56.95	2236.34	a	654.14
11 Aug	18.11	493.03	57.02	1083.33	37.95	1034.74	a	2236.34	43.75	697.89
12 Aug	3.74	496.77	90.54	1173.87	63.92	1098.66	72.29	2308.63	37.36	735.25
13 Aug			11.36	1185.23	a	1098.66	114.63	2423.26	45.93	781.18
14 Aug			a	1185.23	29.35	1128.01	158.13	2581.39	16.01	797.19
15 Aug			5.13	1190.36	25.26	1153.27				
16 Aug			16.23	1206.59	35.04	1188.31				
17 Aug			0.00	1206.59						
18 Aug			0.00	1206.59						
19 Aug			3.12	1209.71						
20 Aug			0.00	1209.71						
21 Aug			a	1209.71						
22 Aug			0.00	1209.71						
23 Aug			0.00	1209.71						
24 Aug			0.00	1209.71						
25 Aug			0.91	1210.62						
26 Aug			5.56	1216.18						
27 Aug			1.86	1218.04						
28 Aug			0.93	1218.97						
29 Aug			0.00	1218.97						
30 Aug			0.00	1218.97						

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Date	1998		1999		2000		2001		2002	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
5 Jul							0.00	0.00	5.00	5.00
6 Jul							2.59	2.59	3.39	8.39
7 Jul					1.28	1.28	2.44	5.03	12.50	20.89
8 Jul					0.83	2.11	0.83	5.86	5.98	26.87
9 Jul					0.00	2.11	10.72	16.58	1.70	28.57
10 Jul	5.22	5.22			2.50	4.61	8.39	24.97	6.83	35.40
11 Jul	0.85	6.07	0.00	0.00	3.44	8.05	20.07	45.04	22.86	58.26
12 Jul	<sup>a</sup>	6.07	0.00	0.00	3.45	11.50	12.63	57.67	31.54	89.80
13 Jul	15.89	21.96	0.00	0.00	2.54	14.04	17.32	74.99	21.67	111.47
14 Jul	7.53	29.49	0.00	0.00	8.57	22.61	45.57	120.56	28.05	139.52
15 Jul	14.07	43.56	0.00	0.00	0.87	23.48	38.86	159.42	14.27	153.79
16 Jul	17.33	60.89	0.00	0.00	3.38	26.86	32.80	192.22	35.27	189.06
17 Jul	5.07	65.96	4.26	4.26	12.77	39.63	48.77	240.99	36.50	225.56
18 Jul	9.02	74.98	8.48	12.74	3.58	43.21	36.98	277.97	24.41	249.97
19 Jul	<sup>a</sup>	74.98	5.89	18.63	19.51	62.72	67.08	345.05	30.30	280.27
20 Jul	18.66	93.64	5.11	23.74	14.57	77.29	26.05	371.10	44.91	325.18
21 Jul	11.87	105.51	23.75	47.49	27.69	104.98	29.51	400.61	36.30	361.48
22 Jul	0	105.51	11.91	59.40	41.00	145.98	108.97	509.58	33.08	394.56
23 Jul	29.58	135.09	6.09	65.49	16.29	162.27	50.79	560.37	40.00	434.56
24 Jul	27.33	162.42	24.95	90.44	14.62	176.89	58.96	619.33	62.76	497.32
25 Jul	24.68	187.10	28.73	119.17	22.98	199.87	80.59	699.92	45.64	542.96
26 Jul	<sup>a</sup>	187.10	39.72	158.89	40.28	240.15	94.06	793.98	34.29	577.25
27 Jul	23.91	211.01	80.39	239.28	41.52	281.67	95.06	889.04	50.41	627.66
28 Jul	51.91	262.92	<sup>a</sup>	239.28	62.34	344.01	58.24	947.28	<sup>a</sup>	627.66
29 Jul	34.16	297.08	55.00	294.28	96.00	440.01	54.33	1001.61	25.74	653.40
30 Jul	24.59	321.67	49.66	343.94	138.20	578.21	35.36	1036.97	28.90	682.30
31 Jul	15.69	337.36	160.53	504.47	85.87	664.08	38.63	1075.60	12.68	694.98
1 Aug	25.44	362.80	145.02	649.49	101.16	765.24	61.50	1137.10	27.85	722.83
2 Aug	<sup>a</sup>	362.80	41.67	691.16	64.37	829.61	16.55	1153.65	19.93	742.76
3 Aug	26.67	389.47	33.19	724.35	44.32	873.93	44.21	1197.86	25.31	768.07
4 Aug	42.35	431.82	74.23	798.58	77.14	951.07	30.71	1228.57	<sup>a</sup>	768.07
5 Aug	8.57	440.39	108.04	906.62	67.26	1018.33	43.64	1272.21	12.86	780.93
6 Aug	6.00	446.39	82.79	989.41	38.92	1057.25	30.00	1302.21	23.05	803.98
7 Aug	5.11	451.50	82.73	1072.14	37.50	1094.75	26.31	1328.52	10.18	814.16
8 Aug	16.40	467.90	<sup>a</sup>	1072.14	93.37	1188.12	34.40	1362.92	11.96	826.12
9 Aug	17.20	485.10	55.58	1127.72	81.50	1269.62	23.01	1385.93	8.60	834.72
10 Aug	9.46	494.56	44.73	1172.45	113.87	1383.49	54.88	1440.81	15.27	849.99
11 Aug	10.29	504.85	58.13	1230.58	50.57	1434.06	73.64	1514.45	11.10	861.09
12 Aug	19.44	524.29	48.50	1279.08	24.86	1458.92	47.23	1561.68	7.66	868.75
13 Aug	10.21	534.50	78.37	1357.45	14.57	1473.49	13.04	1574.72		
14 Aug	3.85	538.35			7.83	1481.32				
15 Aug	0.00	538.35								
16 Aug										
17 Aug										
18 Aug										
19 Aug										

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Date	2003		2004		2005		2006		2007	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
2 Jul			0	0						
3 Jul			0.78	0.78						
4 Jul			0.78	1.56						
5 Jul			0	1.56						
6 Jul			0.77	2.33						
7 Jul			3.80	6.13	9.14	9.14	0.00	0.00		
8 Jul			1.54	7.67		<sup>a</sup> 9.14	0.78	0.78		
9 Jul	7.57	7.57	2.31	9.98		<sup>a</sup> 9.14	0.00	0.78		
10 Jul	3.64	11.21	9.95	19.93		<sup>a</sup> 9.14	4.75	5.53		
11 Jul	3.76	14.97	12.00	31.93	0.00	9.14	0.79	6.32	2.58	2.58
12 Jul	2.20	17.17	6.10	38.03	0.00	9.14	9.32	15.64	0.84	3.42
13 Jul	5.19	22.36	11.89	49.92	1.55	10.69	1.57	17.21	3.23	6.65
14 Jul	6.06	28.42	11.32	61.24	3.79	14.48	5.44	22.65	4.69	11.34
15 Jul	4.49	32.91	6.15	67.39	11.46	25.94	9.38	32.03		<sup>a</sup> 11.34
16 Jul	5.33	38.24	12.75	80.14	10.20	36.14	9.41	41.44	0.83	12.17
17 Jul	0.00	38.24	6.15	86.29	35.34	71.48	7.04	48.48	6.21	18.38
18 Jul	8.83	47.07	1.53	87.82	15.24	86.72	1.57	50.05	12.12	30.50
19 Jul	5.37	52.44	1.53	89.35	33.76	120.48	2.38	52.43	20.48	50.98
20 Jul	15.14	67.58	17.30	106.65	20.44	140.92		<sup>a</sup> 52.43	14.03	65.01
21 Jul	2.23	69.81	6.10	112.75	42.18	183.10	2.40	54.83	29.64	94.65
22 Jul	2.20	72.01	4.46	117.21	24.91	208.01	4.80	59.63		<sup>a</sup> 94.65
23 Jul	5.93	77.94	10.57	127.78	21.55	229.56	2.40	62.03	6.15	100.80
24 Jul	11.01	88.95	9.87	137.65	19.38	248.94	3.95	65.98	45.23	146.03
25 Jul	17.30	106.25	12.87	150.52	20.64	269.58	9.54	75.52	56.21	202.24
26 Jul	41.36	147.61	12.95	163.47	25.58	295.16	6.34	81.86	25.16	227.40
27 Jul	29.65	177.26	14.62	178.09	34.94	330.10	8.77	90.63	22.47	249.87
28 Jul	23.41	200.67	29.82	207.91	7.79	337.89	4.80	95.43	17.74	267.61
29 Jul	37.89	238.56	13.80	221.71	33.00	370.89	17.92	113.35		<sup>a</sup> 267.61
30 Jul	53.63	292.19	15.80	237.51	37.27	408.16	10.3	123.65	25.10	292.71
31 Jul	48.54	340.73	18.00	255.51	30.72	438.88	5.58	129.23	47.43	340.14
1 Aug	17.94	358.67	19.75	275.26	42.12	481.00	0.00	129.23	27.59	367.73
2 Aug	38.62	397.29	20.84	296.10	60.00	541.00	8.71	137.94	19.08	386.81
3 Aug	15.41	412.70	43.09	339.19	18.89	559.89	7.20	145.14	48.00	434.81
4 Aug	20.12	432.82	66.08	405.27	6.15	566.04	15.05	160.19	38.08	472.89
5 Aug	29.14	461.96	93.54	498.81	26.75	592.79	11.84	172.03		<sup>a</sup> 472.89
6 Aug	31.21	493.17	71.20	570.01	14.07	606.86	21.25	193.28	49.59	522.48
7 Aug	62.81	555.98	56.59	626.60	40.75	647.61	24.46	217.74	26.34	548.82
8 Aug	39.29	595.27	41.18	667.78	57.37	704.98	22.64	240.38	94.62	643.44
9 Aug	27.24	622.51	45.54	713.32	74.89	779.87	23.69	264.07	98.82	742.26
10 Aug	29.18	651.69	27.13	740.45	68.57	848.44	12.00	276.07	120.38	862.64
11 Aug	40.34	692.03	56.70	797.15	95.28	943.72		<sup>a</sup> 276.07	77.36	940.00
12 Aug	17.04	709.07	57.57	854.72	75.35	1019.07		<sup>a</sup> 276.07		<sup>a</sup> 940.00
13 Aug	39.79	748.86			61.12	1080.19		<sup>a</sup> 276.07	38.29	978.29
14 Aug					97.44	1177.63	15.60	291.67	43.98	1022.27
15 Aug					28.92	1206.55	59.23	350.90	41.95	1064.22
16 Aug							115	465.87	57.37	1121.59
17 Aug							82.26	548.13	89.41	1211.00
18 Aug							101.2	649.31	49.35	1260.35
19 Aug							93.63	742.94		<sup>a</sup> 1260.35
20 Aug									81.76	1342.11

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Date	2008	
	Daily	Cum.
9 Jul	0.00	0.00
10 Jul	4.82	4.82
11 Jul	4.07	8.89
12 Jul	7.98	16.87
13 Jul	<sup>a</sup>	16.87
14 Jul	9.85	26.72
15 Jul	23.36	50.08
16 Jul	22.27	72.35
17 Jul	56.74	129.09
18 Jul	60.25	189.34
19 Jul	108.63	297.97
20 Jul	<sup>a</sup>	297.97
21 Jul	94.15	392.12
22 Jul	64.00	456.12
23 Jul	46.09	502.21
24 Jul	106.76	608.97
25 Jul	94.04	703.01
26 Jul	142.25	845.26
27 Jul	52.80	898.06
28 Jul	92.77	990.83
29 Jul	123.97	1114.80
30 Jul	90.00	1204.80
31 Jul	87.36	1292.16
1 Aug	138.07	1430.23
2 Aug	77.04	1507.27
3 Aug	49.83	1557.10
4 Aug	69.40	1626.50
5 Aug	59.26	1685.76
6 Aug	93.47	1779.23
7 Aug	67.26	1846.49
8 Aug	85.85	1932.34
9 Aug	35.74	1968.08
10 Aug	28.06	1996.14
11 Aug	56.30	2052.44
12 Aug	80.00	2132.44
13 Aug	99.85	2232.29
14 Aug	36.50	2268.79
15 Aug		
16 Aug		
17 Aug		
18 Aug		
19 Aug		
20 Aug		

*Note:* Blank cells indicate no data.

<sup>a</sup> Day off.

Appendix A2.—Kobuk River chum salmon test fishery time and site distribution expressed as mean CPUE, 1993–2008.

Year	Mean CPUE by Drift Period <sup>a</sup>			Period Yearly Mean CPUE	Percent Mean CPUE by Drift Period			Mean CPUE by Site <sup>b</sup>		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	16.7	25.8	42.5	31.6	3.4	8.5	6.0	28.6	71.4
1994	25.8	33.2	23.7	27.6	31.2	40.1	28.7	1.7	18.6	10.1	8.4	91.6
1995	32.1	37.6	39.9	36.5	29.3	34.3	36.4	8.5	16.2	12.4	34.3	65.7
1996	73.2	81.7	66.5	73.8	33.1	36.9	30.0	13.7	36.4	25.0	27.3	72.7
1997	23.9	23.3	23.6	23.6	33.7	32.9	33.4	4.3	11.4	7.8	27.3	72.7
1998	18.6	19.4	13.1	17.0	36.4	38.1	25.6	2.8	8.6	5.7	24.4	75.6
1999	49.7	38.6	25.4	37.9	43.7	34.0	22.3	5.2	25.5	15.4	17.0	83.0
2000	40.9	36.7	36.1	37.9	35.9	32.3	31.8	9.1	16.3	12.7	35.8	64.2
2001	47.8	34.1	34.8	38.9	41.0	29.2	29.8	8.0	18.4	13.2	30.2	69.8
2002	20.9	26.5	22.9	23.5	29.7	37.7	32.6	4.3	11.0	7.6	28.0	72.0
2003	23.0	20.2	18.4	20.5	37.4	32.8	29.8	3.5	10.1	6.8	25.4	74.6
2004	19.1	24.0	19.3	20.8	30.7	38.4	30.9	4.3	9.5	6.9	30.9	69.1
2005	31.7	33.4	34.7	33.3	31.8	33.4	34.8	10.9	12.4	11.6	46.9	53.1
2006	23.5	16.8	15.5	18.6	42.2	30.1	27.8	4.3	9.4	6.9	31.2	68.8
2007	32.7	38.8	40.7	37.4	29.1	34.6	36.3	14.0	11.7	12.8	54.6	45.4
2008	66.1	60.6	65.1	63.9	34.5	31.6	33.9	12.4	32.3	22.3	27.7	72.3

<sup>a</sup> Drift 1 begins at 0800 hours, Drift 2 at 1500 hours and Drift 3 at 2200 hours. There are 2 drifts (one on each riverbank) in each drift period.

<sup>b</sup> Site N is the North Bank and Site S is the South Bank. The Mean CPUE is the cumulative CPUE for each riverbank for the season divided by the number of drifts on that riverbank during the season.

Appendix A3.–Kobuk River chum salmon test fishery comparison, 1993–2008.

Year	Project Operation Dates	Number of test fish Drifts	Number of days off Inseason <sup>a</sup>	Rank by number of Drifts	Cumulative CPUE	Rank by cumulative CPUE
1993	7/12–8/12	164	4	16	496.77	16
1994	7/13–8/30	248	6	1	1,218.97	7
1995	7/12–8/16	196	3	13	1,188.31	9
1996	7/09–8/14	208	2	8	2,581.39	1
1997	7/09–8/14	202	3	11	797.19	12
1998	7/10–8/15	182	4	14	538.35	15
1999	7/11–8/13	176	2	15	1,357.45	5
2000	7/07–8/14	228	0	4	1,481.32	4
2001	7/05–8/13	232	0	3	1,574.72	3
2002	7/05–8/12	218	2	5	868.75	10
2003	7/09–8/13	214	0	7	748.86	13
2004	7/02–8/12	242	0	2	854.72	11
2005	7/07–8/15	207	3	9	1,206.55	8
2006	7/07–8/19	217	4	6	742.94	14
2007	7/11–8/20	207	6	9	1,342.11	6
2008	7/09–8/14	200	2	12	2,268.79	2

<sup>a</sup> Number of days during the season where the crew had the day off and no test fishing occurred.

Appendix A4.–Kobuk River chum salmon test fishery mean daily and cumulative CPUE proportions, 1993–2008.

Date	1993		1994		1995		1996		1997	
	Daily	Cum.								
9 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	0.041	0.093	0.002	0.002	0.002	0.003	a	0.095	0.008	0.031
15 Jul	0.071	0.163	0.002	0.004	0.002	0.005	0.032	0.128	0.005	0.035
16 Jul	0.027	0.190	0.009	0.014	a	0.005	0.028	0.155	0.018	0.053
17 Jul	0.035	0.224	a	0.014	0.000	0.005	0.021	0.177	0.019	0.072
18 Jul	a	0.224	0.006	0.020	0.002	0.007	0.035	0.212	0.020	0.093
19 Jul	0.022	0.246	0.010	0.030	0.008	0.015	0.021	0.233	0.023	0.115
20 Jul	0.006	0.252	0.003	0.033	0.014	0.029	0.025	0.258	a	0.115
21 Jul	0.006	0.258	0.006	0.039	0.032	0.061	0.020	0.278	0.023	0.138
22 Jul	0.011	0.269	0.003	0.042	0.018	0.079	0.020	0.297	0.017	0.155
23 Jul	0.055	0.324	0.014	0.055	0.043	0.122	0.035	0.333	0.014	0.169
24 Jul	0.018	0.342	a	0.055	0.024	0.146	0.036	0.368	0.029	0.197
25 Jul	a	0.342	0.012	0.067	0.034	0.180	0.030	0.398	0.027	0.224
26 Jul	0.031	0.373	0.039	0.106	0.030	0.209	0.022	0.420	0.018	0.243
27 Jul	0.016	0.389	0.033	0.139	0.054	0.263	0.012	0.431	0.023	0.266
28 Jul	0.033	0.422	0.047	0.187	0.053	0.316	0.019	0.450	0.038	0.304
29 Jul	0.002	0.424	0.028	0.214	0.039	0.354	0.027	0.478	0.035	0.339
30 Jul	0.002	0.426	0.057	0.271	0.049	0.403	0.014	0.491	0.028	0.367
31 Jul	0.025	0.451	a	0.271	0.025	0.428	0.032	0.523	0.041	0.408
1 Aug	a	0.451	0.067	0.339	0.061	0.490	0.065	0.588	0.052	0.460
2 Aug	0.014	0.464	0.053	0.392	0.041	0.531	0.024	0.612	0.028	0.488
3 Aug	0.115	0.579	0.059	0.451	0.041	0.571	0.019	0.631	0.044	0.533
4 Aug	0.089	0.668	0.089	0.540	0.045	0.616	0.026	0.656	0.033	0.566
5 Aug	0.180	0.848	0.049	0.589	0.042	0.658	0.023	0.680	0.031	0.597
6 Aug	0.037	0.886	0.084	0.673	a	0.658	0.031	0.711	0.053	0.650
7 Aug	0.041	0.927	a	0.673	0.039	0.697	0.035	0.746	0.045	0.695
8 Aug	a	0.927	0.051	0.725	0.037	0.734	0.057	0.803	0.057	0.751
9 Aug	0.004	0.931	0.079	0.804	0.057	0.791	0.041	0.844	0.069	0.821
10 Aug	0.025	0.956	0.038	0.842	0.047	0.839	0.022	0.866	a	0.821
11 Aug	0.036	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						

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Date	1998		1999		2000		2001		2002	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
5 Jul							0.000	0.000	0.006	0.006
6 Jul							0.002	0.002	0.004	0.010
7 Jul					0.001	0.001	0.002	0.003	0.014	0.024
8 Jul					0.001	0.001	0.001	0.004	0.007	0.031
9 Jul					0.000	0.001	0.007	0.011	0.002	0.033
10 Jul	0.010	0.010			0.002	0.003	0.005	0.016	0.008	0.041
11 Jul	0.002	0.011	0.000	0.000	0.002	0.005	0.013	0.029	0.026	0.067
12 Jul		<sup>a</sup> 0.011	0.000	0.000	0.002	0.008	0.008	0.037	0.036	0.103
13 Jul	0.030	0.041	0.000	0.000	0.002	0.009	0.011	0.048	0.025	0.128
14 Jul	0.014	0.055	0.000	0.000	0.006	0.015	0.029	0.077	0.032	0.161
15 Jul	0.026	0.081	0.000	0.000	0.001	0.016	0.025	0.101	0.016	0.177
16 Jul	0.032	0.113	0.000	0.000	0.002	0.018	0.021	0.122	0.041	0.218
17 Jul	0.009	0.123	0.003	0.003	0.009	0.027	0.031	0.153	0.042	0.260
18 Jul	0.017	0.139	0.006	0.009	0.002	0.029	0.023	0.177	0.028	0.288
19 Jul		<sup>a</sup> 0.139	0.004	0.014	0.013	0.042	0.043	0.219	0.035	0.323
20 Jul	0.035	0.174	0.004	0.017	0.010	0.052	0.017	0.236	0.052	0.374
21 Jul	0.022	0.196	0.017	0.035	0.019	0.071	0.019	0.254	0.042	0.416
22 Jul	0.000	0.196	0.009	0.044	0.028	0.099	0.069	0.324	0.038	0.454
23 Jul	0.055	0.251	0.004	0.048	0.011	0.110	0.032	0.356	0.046	0.500
24 Jul	0.051	0.302	0.018	0.067	0.010	0.119	0.037	0.393	0.072	0.572
25 Jul	0.046	0.348	0.021	0.088	0.016	0.135	0.051	0.444	0.053	0.625
26 Jul		<sup>a</sup> 0.348	0.029	0.117	0.027	0.162	0.060	0.504	0.039	0.664
27 Jul	0.044	0.392	0.059	0.176	0.028	0.190	0.060	0.565	0.058	0.722
28 Jul	0.096	0.488		<sup>a</sup> 0.176	0.042	0.232	0.037	0.602		<sup>a</sup> 0.722
29 Jul	0.063	0.552	0.041	0.217	0.065	0.297	0.035	0.636	0.030	0.752
30 Jul	0.046	0.598	0.037	0.253	0.093	0.390	0.022	0.659	0.033	0.785
31 Jul	0.029	0.627	0.118	0.372	0.058	0.448	0.025	0.683	0.015	0.800
1 Aug	0.047	0.674	0.107	0.478	0.068	0.517	0.039	0.722	0.032	0.832
2 Aug		<sup>a</sup> 0.674	0.031	0.509	0.043	0.560	0.011	0.733	0.023	0.855
3 Aug	0.050	0.723	0.024	0.534	0.030	0.590	0.028	0.761	0.029	0.884
4 Aug	0.079	0.802	0.055	0.588	0.052	0.642	0.020	0.780		<sup>a</sup> 0.884
5 Aug	0.016	0.818	0.080	0.668	0.045	0.687	0.028	0.808	0.015	0.899
6 Aug	0.011	0.829	0.061	0.729	0.026	0.714	0.019	0.827	0.027	0.925
7 Aug	0.009	0.839	0.061	0.790	0.025	0.739	0.017	0.844	0.012	0.937
8 Aug	0.030	0.869		<sup>a</sup> 0.790	0.063	0.802	0.022	0.865	0.014	0.951
9 Aug	0.032	0.901	0.041	0.831	0.055	0.857	0.015	0.880	0.010	0.961
10 Aug	0.018	0.919	0.033	0.864	0.077	0.934	0.035	0.915	0.018	0.978
11 Aug	0.019	0.938	0.043	0.907	0.034	0.968	0.047	0.962	0.013	0.991
12 Aug	0.036	0.974	0.036	0.942	0.017	0.985	0.030	0.992	0.009	1.000
13 Aug	0.019	0.993	0.058	1.000	0.010	0.995	0.008	1.000		
14 Aug	0.007	1.000			0.005	1.000				
15 Aug	0.000	1.000								
16 Aug										
17 Aug										
18 Aug										
19 Aug										

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Date	2003		2004		2005		2006		2007	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
2 Jul			0.000	0.000						
3 Jul			0.001	0.001						
4 Jul			0.001	0.002						
5 Jul			0.000	0.002						
6 Jul			0.001	0.003						
7 Jul			0.004	0.007	0.008	0.008	0.000	0.000		
8 Jul			0.002	0.009		<sup>a</sup> 0.008	0.001	0.001		
9 Jul	0.010	0.010	0.003	0.012		<sup>a</sup> 0.008	0.000	0.001		
10 Jul	0.005	0.015	0.012	0.023		<sup>a</sup> 0.008	0.006	0.007		
11 Jul	0.005	0.020	0.014	0.037	0.000	0.008	0.001	0.009	0.002	0.002
12 Jul	0.003	0.023	0.007	0.044	0.000	0.008	0.013	0.021	0.001	0.003
13 Jul	0.007	0.030	0.014	0.058	0.001	0.009	0.002	0.023	0.002	0.005
14 Jul	0.008	0.038	0.013	0.072	0.003	0.012	0.007	0.030	0.003	0.008
15 Jul	0.006	0.044	0.007	0.079	0.009	0.021	0.013	0.043		<sup>a</sup> 0.008
16 Jul	0.007	0.051	0.015	0.094	0.008	0.030	0.013	0.056	0.001	0.009
17 Jul	0.000	0.051	0.007	0.101	0.029	0.059	0.009	0.065	0.005	0.014
18 Jul	0.012	0.063	0.002	0.103	0.013	0.072	0.002	0.067	0.009	0.023
19 Jul	0.007	0.070	0.002	0.105	0.028	0.100	0.003	0.071	0.015	0.038
20 Jul	0.020	0.090	0.020	0.125	0.017	0.117		<sup>a</sup> 0.071	0.010	0.048
21 Jul	0.003	0.093	0.007	0.132	0.035	0.152	0.003	0.074	0.022	0.071
22 Jul	0.003	0.096	0.005	0.137	0.021	0.172	0.006	0.080		<sup>a</sup> 0.071
23 Jul	0.008	0.104	0.012	0.149	0.018	0.190	0.003	0.083	0.005	0.075
24 Jul	0.015	0.119	0.012	0.161	0.016	0.206	0.005	0.089	0.034	0.109
25 Jul	0.023	0.142	0.015	0.176	0.017	0.223	0.013	0.102	0.042	0.151
26 Jul	0.055	0.197	0.015	0.191	0.021	0.245	0.009	0.110	0.019	0.169
27 Jul	0.040	0.237	0.017	0.208	0.029	0.274	0.012	0.122	0.017	0.186
28 Jul	0.031	0.268	0.035	0.243	0.006	0.280	0.006	0.128	0.013	0.199
29 Jul	0.051	0.319	0.016	0.259	0.027	0.307	0.024	0.153		<sup>a</sup> 0.199
30 Jul	0.072	0.390	0.018	0.278	0.031	0.338	0.014	0.166	0.019	0.218
31 Jul	0.065	0.455	0.021	0.299	0.025	0.364	0.008	0.174	0.035	0.253
1 Aug	0.024	0.479	0.023	0.322	0.035	0.399	0.000	0.174	0.021	0.274
2 Aug	0.052	0.531	0.024	0.346	0.050	0.448	0.012	0.186	0.014	0.288
3 Aug	0.021	0.551	0.050	0.397	0.016	0.464	0.010	0.195	0.036	0.324
4 Aug	0.027	0.578	0.077	0.474	0.005	0.469	0.020	0.216	0.028	0.352
5 Aug	0.039	0.617	0.109	0.584	0.022	0.491	0.016	0.232		<sup>a</sup> 0.352
6 Aug	0.042	0.659	0.083	0.667	0.012	0.503	0.029	0.260	0.037	0.389
7 Aug	0.084	0.742	0.066	0.733	0.034	0.537	0.033	0.293	0.020	0.409
8 Aug	0.052	0.795	0.048	0.781	0.048	0.584	0.030	0.324	0.071	0.479
9 Aug	0.036	0.831	0.053	0.835	0.062	0.646	0.032	0.355	0.074	0.553
10 Aug	0.039	0.870	0.032	0.866	0.057	0.703	0.016	0.372	0.090	0.643
11 Aug	0.054	0.924	0.066	0.933	0.079	0.782		<sup>a</sup> 0.372	0.058	0.700
12 Aug	0.023	0.947	0.067	1.000	0.062	0.845		<sup>a</sup> 0.372		<sup>a</sup> 0.700
13 Aug	0.053	1.000			0.051	0.895		<sup>a</sup> 0.372	0.029	0.729
14 Aug					0.081	0.976	0.021	0.393	0.033	0.762
15 Aug					0.024	1.000	0.080	0.472	0.031	0.793
16 Aug							0.155	0.627	0.043	0.836
17 Aug							0.111	0.738	0.067	0.902
18 Aug							0.136	0.874	0.037	0.939
19 Aug							0.126	1.000		<sup>a</sup> 0.939
20 Aug									0.061	1.000

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Date	2008	
	Daily	Cum.
9 Jul	0.000	0.000
10 Jul	0.002	0.002
11 Jul	0.002	0.004
12 Jul	0.004	0.007
13 Jul	<sup>a</sup>	0.007
14 Jul	0.004	0.012
15 Jul	0.010	0.022
16 Jul	0.010	0.032
17 Jul	0.025	0.057
18 Jul	0.027	0.083
19 Jul	0.048	0.131
20 Jul	<sup>a</sup>	0.131
21 Jul	0.041	0.173
22 Jul	0.028	0.201
23 Jul	0.020	0.221
24 Jul	0.047	0.268
25 Jul	0.041	0.310
26 Jul	0.063	0.373
27 Jul	0.023	0.396
28 Jul	0.041	0.437
29 Jul	0.055	0.491
30 Jul	0.040	0.531
31 Jul	0.039	0.570
1 Aug	0.061	0.630
2 Aug	0.034	0.664
3 Aug	0.022	0.686
4 Aug	0.031	0.717
5 Aug	0.026	0.743
6 Aug	0.041	0.784
7 Aug	0.030	0.814
8 Aug	0.038	0.852
9 Aug	0.016	0.867
10 Aug	0.012	0.880
11 Aug	0.025	0.905
12 Aug	0.035	0.940
13 Aug	0.044	0.984
14 Aug	0.016	1.000
15 Aug		
16 Aug		
17 Aug		
18 Aug		
19 Aug		
20 Aug		

Note: Blank cells indicate no data.

<sup>a</sup> Day off.

Appendix A5.—Kobuk River escapement, subsistence, test fishery, and Kotzebue commercial chum salmon catch data, 1993–2008.

Year	Date	Drifts	Kobuk River Chum CPUE	Commercial Chum Catch	Kobuk River Subsistence	Total Catch	Kobuk River Escapement <sup>a</sup>
1993	7/12–8/12	164	496.77	73,071	<sup>b</sup>	73,071	31,697
1994	7/13–8/30	248	1,218.97	153,452	36,167	189,619	
1995	7/12–8/16	196	1,188.31	290,730	38,972	329,702	64,219
1996	7/09–8/14	208	2,581.39	82,110	40,060	122,170	131,105
1997	7/09–8/14	202	797.19	142,720	27,251	169,971	
1998	7/10–8/15	182	538.35	55,907	21,882	77,789	
1999	7/11–8/13	176	1,357.45	138,605	28,114	166,719	48,748
2000	7/07–8/14	228	1,481.32	159,802	23,518	183,320	
2001	7/05–8/13	232	1,574.72	211,672	29,646 <sup>c</sup>	241,318	
2002	7/05–8/12	218	868.75	8,390	13,943 <sup>b</sup>	22,333	
2003	7/09–8/13	216	748.86	25,763	18,685	44,448	
2004	7/02–8/12	242	854.72	51,038	22,208	73,246	
2005	7/07–8/15	207	1,206.55	75,971	<sup>d</sup>	75,971	
2006	7/07–8/19	217	742.94	137,567	<sup>d</sup>	137,567	46,475
2007	7/11–8/20	207	1342.11	147,085	<sup>d</sup>	147,085	
2008	7/09–8/14	200	2268.79	190,321	<sup>d</sup>	190,321	42,622

Note: Blank cells indicate no data unless otherwise noted.

<sup>a</sup> The escapement goal for rivers surveyed in the Kobuk River system is 30,500 chums prior to 2005. From 2005 to 2006 the escapement goal range was 19,600 - 39,200 chums and in 2007 the escapement goal range was 19,200 to 41,700 chum salmon. Years of poor aerial survey conditions, or when surveys were not done, were left blank in the table.

<sup>b</sup> Several Kobuk River villages were not surveyed in 1993 and 2002.

<sup>c</sup> Ambler village was not surveyed in 2001.

<sup>d</sup> Subsistence survey data not available.

## **APPENDIX B. AGE, SEX, AND LENGTH**

Appendix B1.—Comparison of age and sex compositions by year for Kobuk River test fishery chum salmon catch samples, 1993–2008.

Year	Sampling Dates	Number of Samples	Percent by Sex		Percent by (Age Group)				
			Male	Female	(0.2)	(0.3)	(0.4)	(0.5)	(0.6)
1993	7/17–8/12	462	52.6	47.4	1.7	28.8	66.0	3.5	0.0
1994	7/13–8/29	624	63.0	37.0	3.0	58.0	36.6	2.4	0.0
1995	7/13–8/16	1,025	63.3	36.7	2.2	61.5	34.0	2.2	0.0
1996	7/09–8/14	1,633	54.8	45.2	0.5	31.9	58.4	8.9	0.3
1997	7/09–8/14	756	56.2	43.8	1.3	23.9	59.3	15.2	0.3
1998	7/10–8/15	536	43.5	56.5	4.9	51.3	31.0	11.9	0.9
1999	7/17–8/13	913	59.7	40.3	0.4	92.0	5.9	1.4	0.2
2000	7/07–8/14	635	47.1	52.9	1.1	60.9	37.6	0.3	0.0
2001	7/06–8/13	930	42.0	58.0	1.9	36.9	58.6	2.6	0.0
2002	7/05–8/12	793	45.0	55.0	0.1	24.8	67.2	7.8	0.0
2003	7/09–8/13	566	29.2	70.8	1.6	54.2	30.4	13.8	0.0
2004	7/03–8/12	578	47.9	52.1	11.1	47.4	37.5	3.5	0.5
2005	7/07–8/15	581	47.0	53.0	0.2	84.7	14.3	0.9	0.0
2006	7/08–8/19	521	34.9	65.1	16.5	42.2	41.3	0.0	0.0
2007	7/11–8/20	727	54.9	45.1	2.3	61.1	32.5	4.1	0.0
2008	7/09–8/14	543	43.2	56.8	0.0	47.7	44.7	7.4	0.2

Appendix B2.—Comparison of length by age, sex and year for Kobuk River test fishery chum salmon catch, 1993–2008.

Year	Sampling Dates	Number of Samples	Sex	Mean Length by (Age Group)				
				(0.2)	(0.3)	(0.4)	(0.5)	(0.6)
1993	7/17–8/12	462	Male	565	611	624	629	
			Female	557	580	594	623	
1994	7/13–8/29	624	Male	561	603	622	624	
			Female	559	587	601	599	
1995	7/13–8/16	1,025	Male	577	604	618	627	
			Female	553	588	595	599	
1996	7/09–8/18	1,633	Male	570	615	636	636	643
			Female	592	599	611	618	645
1997	7/09–8/14	756	Male	562	619	637	647	613
			Female	550	596	613	624	
1998	7/10–8/14	536	Male	577	618	636	636	
			Female	562	592	607	623	616
1999	7/17–8/13	913	Male	573	608	607	609	590
			Female		592	587	580	610
2000	7/07–8/14	635	Male	570	596	616	570	
			Female	566	581	591	580	
2001	7/06–8/13	930	Male	583	606	621	629	
			Female	575	583	599	622	
2002	7/05–8/12	793	Male	641	650	648	647	
			Female	565	608	617	608	614
2003	7/09–8/13	566	Male	588	636	655	679	
			Female	578	597	618	626	
2004	7/03–8/12	578	Male	600	627	624	650	668
			Female	577	590	595	596	600
2005	7/07–8/15	581	Male	575	622	642	639	
			Female		589	603	630	
2006	7/08–8/19	521	Male	588	614	624		
			Female	570	579	590		
2007	7/11–8/20	727	Male	569	602	607	658	
			Female	540	584	595	594	
2008	7/09–8/14	542	Male		616	635	624	630
			Female		598	604	606	

Note: Length was measured from mid-eye to fork of tail (METF) in mm. Blank cells indicate no data.

Appendix B3.—Comparison of age and sex compositions by year for Noatak River test fishery chum salmon catch samples, 1993–2008.

Year	Sampling Dates	Number of Samples	Percent by Sex			Percent by (Age Group)			
			Male	Female	(0.2)	(0.3)	(0.4)	(0.5)	(0.6)
1993	7/24–9/13	956	42.6	57.4	4.8	34.2	58.8	1.8	0.3
1994	7/22–9/10	1,160	47.6	52.6	3.1	68.5	26.8	1.6	0.0
1995	7/20–8/29	1,266	49.2	50.8	2.0	56.1	39.8	1.9	0.2
1996	7/28–8/27	347	45.5	54.5	0.6	47.0	45.5	6.9	0.0
1997	7/27–8/28	214	67.3	32.7	0.5	34.1	56.1	8.9	0.5
1998	7/27–8/28	284	53.1	46.9	5.6	70.1	21.5	2.5	0.3
1999	8/14–8/29	140	52.9	47.1	0.7	80.7	17.1	0.7	0.7
2000	No test fishing occurred.								
2001	8/08–8/15	257	28.8	71.2	4.7	72.4	21.4	1.6	0.0
2002	7/13–8/14	171	42.1	57.9	0.6	42.1	53.2	3.5	0.6
2003	8/01–8/18	49	42.9	57.1	0.0	55.1	40.8	4.1	0.0
2004	8/03–8/18	248	52.4	47.6	16.5	60.9	21.8	0.8	0.0
2005	8/03–8/16	276	48.2	51.8	0.7	88.8	9.4	1.1	0.0
2006	8/14	101	40.6	59.4	3.0	73.3	23.8	0.0	0.0
2007	8/13–8/22	97	45.4	54.6	1.0	33.0	59.8	6.2	0.0
2008	8/05–8/13	177	55.9	44.1	0.6	72.9	20.3	6.2	0.0

*Note:* Blank cells indicate no data.

Appendix B4.—Comparison of length by age, sex and year for Noatak River test fishery chum salmon catch samples, 1993–2008.

Year	Sampling Dates	Number of Samples	Sex	Mean Length by (Age Group)				
				(0.2)	(0.3)	(0.4)	(0.5)	(0.6)
1993	7/24–9/13	956	Male	542	581	604	625	652
			Female	539	558	572	562	650
1994	7/22–9/10	1,160	Male	543	580	604	643	
			Female	525	558	574	579	
1995	7/20–8/29	1,266	Male	576	597	609	622	620
			Female	547	569	576	589	600
1996	7/28–8/27	347	Male		608	631	639	608
			Female	547	593	604	616	
1997	7/27–8/28	214	Male		565	613	636	653
			Female		604	619	625	
1998	7/27–8/28	284	Male	560	606	621	634	
			Female	566	589	601	606	576
1999	8/14–8/29	140	Male	627	613	625	628	623
			Female	560	606	621	634	
2000	No test fishing occurred.							
2001	8/08–8/15	257	Male	567	600	627	655	
			Female	554	576	602	577	
2002	7/13–8/14	171	Male		625	646	692	683
			Female	590	603	616	590	
2003	8/01–8/18	49	Male		610	664	635	
			Female		594	618	635	
2004	8/03–8/18	248	Male	595	609	619	655	
			Female	564	594	597		
2005	8/03–8/16	276	Male	555	612	622	610	
			Female	560	590	604		
2006	8/14	101	Male	565	600	609		
			Female	593	575	595		
2007	8/13–8/22	97	Male	570	610	639	630	
			Female		580	594	620	
2008	8/05–8/13	177	Male	625	602	628	638	
			Female		593	599	582	

Note: Length was measured from mid-eye to fork of tail (METF) in mm. Blank cells indicate no data.

Appendix B5.—Comparison of age and sex compositions by year for Kotzebue commercial chum salmon catch samples, 1993–2008.

Year	Sampling Dates	Number of Samples	Percent by Sex		Percent by (Age Group)				
			Male	Female	(0.2)	(0.3)	(0.4)	(0.5)	(0.6)
1993	7/09–8/28	1,870	52.3	47.7	1.4	20.4	73.3	4.8	0.2
1994	7/12–8/24	3,614	55.2	44.8	3.3	63.0	30.8	2.9	0.0
1995	7/11–8/28	4,621	51.4	48.6	2.2	58.9	36.9	1.9	0.0
1996	7/08–8/26	2,386	49.6	50.4	0.9	40.7	48.9	9.0	0.4
1997	7/10–8/29	4,824	57.6	42.4	1.4	28.7	58.3	10.2	1.4
1998	7/10–8/30	3,128	57.2	42.8	6.2	50.4	29.3	13.3	0.7
1999	7/13–8/27	3,288	51.3	48.7	0.9	87.5	10.6	0.9	0.2
2000	7/11–8/24	3,179	39.2	60.7	2.1	61.6	35.2	1.0	0.0
2001	7/10–8/24	3,670	41.9	58.1	2.4	45.7	49.9	2.0	0.1
2002	No samples taken because of lack of a major buyer.								
2003	7/22–8/19	969	48.9	51.1	0.7	65.6	27.2	6.5	0.0
2004	7/13–8/20	1,472	57.1	42.9	12.8	53.3	32.7	1.0	0.2
2005	7/11–8/22	2,099	45.6	54.4	1.4	87.2	10.9	0.5	0.0
2006	7/11–8/18	1,977	46.2	53.8	3.1	44.6	51.5	0.7	0.0
2007	7/17–8/23	2,364	50.9	49.1	2.0	38.5	50.0	9.4	0.0
2008	7/21–8/25	1,181	45.8	54.2	0.2	68.2	24.3	7.3	0.0

Appendix B6.—Comparison of length by age, sex and year for Kotzebue commercial chum salmon catch samples, 1993–2008.

Year	Sampling Dates	Number of Samples	Sex	Mean Length by (Age Group)				
				(0.2)	(0.3)	(0.4)	(0.5)	(0.6)
1993	7/09–8/28	1,870	Male	589	619	633	641	701
			Female	572	597	610	620	625
1994	7/12–8/24	3,614	Male	567	601	621	629	
			Female	566	582	600	601	
1995	7/11–8/28	4,621	Male	577	614	625	638	638
			Female	574	592	602	614	
1996	7/08–8/26	2,386	Male	562	609	632	639	642
			Female	558	586	606	608	632
1997	7/10–8/29	4,824	Male	564	610	639	654	663
			Female	560	588	609	620	641
1998	7/10–8/30	3,128	Male	583	619	632	646	669
			Female	579	600	614	627	621
1999	7/13–8/27	3,288	Male	583	609	636	626	636
			Female	579	600	614	627	621
2000	7/11–8/24	3,179	Male	576	618	638	637	
			Female	572	593	611	615	
2001	7/10–8/24	3,670	Male	574	607	633	633	630
			Female	565	585	608	622	588
2002	No samples taken.							
2003	7/22–8/19	969	Male	561	607	640	648	
			Female	555	587	615	633	
2004	7/13–8/20	1,472	Male	576	603	624	619	
			Female	553	591	602	627	600
2005	7/11–8/22	2,099	Male	572	616	638	610	
			Female	573	591	606	610	
2006	7/11–8/18	1,977	Male	577	601	620	645	
			Female	565	582	598	602	
2007	7/17–8/23	2,364	Male	570	604	620	625	
			Female	560	584	594	601	
2008	7/21–8/25	1,181	Male	538	605	616	630	
			Female		584	599	601	

Note: Length was measured from mid-eye to fork of tail (METF) in mm. Blank cells indicate no data.



## **APPENDIX C. SHEEFISH**

Appendix C1.–Kobuk River sheefish test fishery mean daily and cumulative CPUE, 1997 and 1999–2008.

Date	1997		1999		2000		2001		2002	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
5 Jul							0.034	0.034	0.108	0.108
6 Jul							0.037	0.070	0.058	0.166
7 Jul					0.045	0.045	0.105	0.175	0.090	0.257
8 Jul					0.063	0.108	0.078	0.253	0.065	0.321
9 Jul	0.000	0.000			0.064	0.172	0.058	0.311	0.086	0.408
10 Jul	0.163	0.163			0.074	0.246	0.055	0.366	0.065	0.472
11 Jul	0.117	0.280	0.081	0.081	0.043	0.289	0.050	0.415	0.059	0.531
12 Jul	0.075	0.356	0.076	0.157	0.042	0.331	0.060	0.476	0.083	0.615
13 Jul	<sup>a</sup>	0.356	0.074	0.231	0.077	0.407	0.036	0.512	0.041	0.655
14 Jul	0.032	0.388	0.085	0.315	0.067	0.474	0.033	0.545	0.028	0.683
15 Jul	0.033	0.421	0.085	0.400	0.048	0.522	0.025	0.570	0.036	0.720
16 Jul	0.053	0.474	0.052	0.452	0.041	0.563	0.025	0.595	0.006	0.725
17 Jul	0.032	0.507	0.047	0.499	0.049	0.612	0.025	0.620	0.006	0.731
18 Jul	0.021	0.528	0.034	0.533	0.048	0.660	0.033	0.653	0.009	0.740
19 Jul	0.000	0.528	0.068	0.601	0.047	0.707	0.027	0.680	0.014	0.754
20 Jul	<sup>a</sup>	0.528	0.068	0.669	0.043	0.750	0.032	0.712	0.008	0.762
21 Jul	0.021	0.549	0.030	0.699	0.026	0.776	0.032	0.743	0.005	0.767
22 Jul	0.011	0.560	0.088	0.787	0.003	0.779	0.003	0.747	0.006	0.773
23 Jul	0.032	0.592	0.020	0.807	0.003	0.782	0.015	0.761	0.005	0.778
24 Jul	0.053	0.645	0.031	0.837	0.008	0.790	0.009	0.771	0.017	0.796
25 Jul	0.032	0.677	0.052	0.889	0.011	0.801	0.022	0.792	0.024	0.820
26 Jul	0.022	0.699	0.016	0.906	0.014	0.815	0.021	0.814	0.005	0.825
27 Jul	0.147	0.846	0.034	0.940	0.014	0.829	0.041	0.854	0.000	0.825
28 Jul	0.071	0.918	<sup>a</sup>	0.940	0.013	0.842	0.014	0.869	<sup>a</sup>	0.825
29 Jul	0.032	0.949	0.000	0.940	0.022	0.864	0.017	0.885	0.018	0.843
30 Jul	0.027	0.976	0.005	0.945	0.026	0.890	0.023	0.909	0.017	0.860
31 Jul	0.010	0.986	0.000	0.945	0.030	0.920	0.023	0.931	0.021	0.882
1 Aug	0.000	0.986	0.003	0.948	0.019	0.939	0.011	0.942	0.006	0.888
2 Aug	0.000	0.986	0.013	0.961	0.012	0.951	0.012	0.954	0.012	0.900
3 Aug	0.000	0.986	0.004	0.965	0.003	0.954	0.009	0.963	0.006	0.906
4 Aug	0.000	0.986	0.016	0.981	0.009	0.962	0.007	0.970	<sup>a</sup>	0.906
5 Aug	0.000	0.986	0.003	0.984	0.007	0.970	0.007	0.977	0.000	0.906
6 Aug	0.000	0.986	0.005	0.989	0.000	0.970	0.009	0.987	0.014	0.920
7 Aug	0.000	0.986	0.011	1.000	0.012	0.982	0.004	0.991	0.009	0.929
8 Aug	0.000	0.986	<sup>a</sup>	1.000	0.008	0.990	0.003	0.993	0.012	0.941
9 Aug	0.000	0.986	0.000	1.000	0.001	0.991	0.003	0.996	0.025	0.966
10 Aug	<sup>a</sup>	0.986	0.000	1.000	0.004	0.995	0.000	0.996	0.015	0.982
11 Aug	0.000	0.986	0.000	1.000	0.001	0.997	0.000	0.996	0.003	0.985
12 Aug	0.000	0.986	0.000	1.000	0.000	0.997	0.000	0.996	0.015	1.000
13 Aug	0.014	1.000	0.000	1.000	0.003	1.000	0.004	1.000		
14 Aug	0.000	1.000			0.000	1.000				
15 Aug										

-continued-

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Date	2003		2004		2005		2006		2007	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
2 Jul			9.41	9.41						
3 Jul			10.87	20.28						
4 Jul			16.42	36.70						
5 Jul			12.35	49.05						
6 Jul			9.26	58.31						
7 Jul			24.30	82.61	11.43	11.43	58.82	58.82		
8 Jul			16.15	98.76		<sup>a</sup> 11.43	53.77	112.59		
9 Jul	60.54	60.54	23.08	121.84		<sup>a</sup> 11.43	40.13	152.72		
10 Jul	55.27	115.81	27.65	149.49		<sup>a</sup> 11.43	55.92	208.64		
11 Jul	31.60	147.41	12.00	161.49	13.89	25.32	60.40	269.04	23.23	23.23
12 Jul	32.29	179.70	13.71	175.20	16.31	41.63	37.28	306.32	12.54	35.77
13 Jul	24.44	204.14	20.06	195.26	17.09	58.72	29.80	336.12	14.55	50.32
14 Jul	9.09	213.23	3.02	198.28	23.47	82.19	47.38	383.50	10.94	61.26
15 Jul	10.47	223.70	8.46	206.74	17.58	99.77	35.18	418.68		<sup>a</sup> 61.26
16 Jul	8.38	232.08	1.50	208.24	25.10	124.87	19.76	438.44	10.76	72.02
17 Jul	7.62	239.70	2.31	210.55	16.20	141.07	35.18	473.62	13.98	86.00
18 Jul	14.72	254.42	15.34	225.89	15.24	156.31	33.73	507.35	10.51	96.51
19 Jul	11.50	265.92	14.52	240.41	11.01	167.32	5.56	512.91	20.48	116.99
20 Jul	11.53	277.45	3.76	244.17	8.33	175.65		<sup>a</sup> 512.91	27.27	144.26
21 Jul	11.89	289.34	8.38	252.55	17.45	193.10	2.40	515.31	26.75	171.01
22 Jul	16.10	305.44	20.80	273.35	12.83	205.93	0.00	515.31		<sup>a</sup> 171.01
23 Jul	8.89	314.33	11.32	284.67	12.73	218.66	12.00	527.31	36.92	207.93
24 Jul	5.14	319.47	13.67	298.34	8.20	226.86	24.47	551.78	38.77	246.70
25 Jul	6.49	325.96	9.09	307.43	0.76	227.62	6.36	558.14	24.98	271.68
26 Jul	3.39	329.35	8.38	315.81	8.28	235.90	8.71	566.85	21.29	292.97
27 Jul	9.18	338.53	6.15	321.96	6.08	241.98	9.44	576.29	4.09	297.06
28 Jul	5.12	343.65	13.82	335.78	4.68	246.66	14.40	590.69	3.13	300.19
29 Jul	2.11	345.76	3.07	338.85	0.00	246.66	8.57	599.26		<sup>a</sup> 300.19
30 Jul	6.70	352.46	0.75	339.60	2.24	248.90	3.17	602.43	20.08	320.27
31 Jul	12.81	365.27	5.25	344.85	3.84	252.74	2.40	604.83	8.54	328.81
1 Aug	13.46	378.73	5.32	350.17	2.94	255.68	0.00	604.83	14.71	343.52
2 Aug	6.21	384.94	18.68	368.85	2.11	257.79	3.17	608.00	19.08	362.60
3 Aug	6.61	391.55	25.19	394.04	9.44	267.23	3.20	611.20	10.05	372.65
4 Aug	8.20	399.75	14.96	409.00	3.08	270.31	7.13	618.33	36.31	408.96
5 Aug	2.30	402.05	13.90	422.90	3.06	273.37	6.32	624.65		<sup>a</sup> 408.96
6 Aug	0.00	402.05	14.35	437.25	1.56	274.93	4.72	629.37	28.34	437.30
7 Aug	1.32	403.37	8.46	445.71	4.53	279.46	2.29	631.66	16.59	453.89
8 Aug	0.71	404.08	4.26	449.97	8.08	287.54	1.51	633.17	23.85	477.74
9 Aug	1.47	405.55	21.69	471.66	7.66	295.20	0.76	633.93	17.44	495.18
10 Aug	0.00	405.55	5.57	477.23	7.03	302.23	2.40	636.33	15.34	510.52
11 Aug	0.00	405.55	17.14	494.37	0.00	302.23		<sup>a</sup> 636.33	16.70	527.22
12 Aug	0.74	406.29	14.88	509.25	0.93	303.16		<sup>a</sup> 636.33		<sup>a</sup> 527.22
13 Aug	1.26	407.55			2.70	305.86		<sup>a</sup> 636.33	20.54	547.76
14 Aug	0.00	407.55			0.90	306.76	1.20	637.53	8.61	556.37
15 Aug					0.00	306.76	0.77	638.30	8.78	565.15
16 Aug							0.00	638.30	4.78	569.93
17 Aug							0.75	639.05	6.27	576.20
18 Aug							3.34	642.39	10.65	586.85
19 Aug							0.00	642.39		<sup>a</sup> 586.85
20 Aug									3.52	590.37

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Date	2008	
	Daily	Cum.
9 Jul	34.70	34.70
10 Jul	28.09	62.79
11 Jul	43.12	105.91
12 Jul	46.40	152.31
13 Jul	<sup>a</sup>	152.31
14 Jul	45.75	198.06
15 Jul	31.15	229.21
16 Jul	32.99	262.20
17 Jul	64.19	326.39
18 Jul	68.28	394.67
19 Jul	32.84	427.51
20 Jul	<sup>a</sup>	427.51
21 Jul	12.00	439.51
22 Jul	26.29	465.80
23 Jul	45.22	511.02
24 Jul	38.82	549.84
25 Jul	40.16	590.00
26 Jul	34.04	624.04
27 Jul	67.20	691.24
28 Jul	25.21	716.45
29 Jul	19.83	736.28
30 Jul	22.00	758.28
31 Jul	17.28	775.56
1 Aug	7.41	782.97
2 Aug	2.96	785.93
3 Aug	10.17	796.10
4 Aug	17.35	813.45
5 Aug	2.96	816.41
6 Aug	0.00	816.41
7 Aug	1.53	817.94
8 Aug	2.77	820.71
9 Aug	1.02	821.73
10 Aug	0.00	821.73
11 Aug	0.00	821.73
12 Aug	0.00	821.73
13 Aug	0.00	821.73
14 Aug	0.00	821.73
15 Aug		
16 Aug		
17 Aug		
18 Aug		
19 Aug		
20 Aug		

*Note:* Blank cells indicate no data.

<sup>a</sup> Day off.

Appendix C2.–Kobuk River sheefish test fishery time and site distribution expressed as mean CPUE, 1997 1999–2008.

Year	Mean CPUE by Drift Period			Period Yearly Mean CPUE	Percent Mean CPUE by Drift Period			Mean CPUE by Drift Site		Site Yearly Mean CPUE	Percent Mean CPUE by Site	
	1	2	3		1	2	3	N	S		N	S
1997	2.5	2.4	2.5	2.5	33.7	32.8	33.5	0.3	1.7	1.0	16.1	83.9
1999	10.0	10.7	10.5	10.4	32.0	34.4	33.6	1.6	5.3	3.4	22.8	77.2
2000	12.7	14.2	15.2	14.0	30.1	33.7	36.2	2.8	6.6	4.7	29.7	70.3
2001	13.8	15.9	17.2	15.6	29.5	34.0	36.6	4.1	6.5	5.3	38.5	61.5
2002	7.0	7.0	7.2	7.1	33.0	33.0	34.0	1.5	3.5	2.5	30.7	69.3
2003	10.6	9.8	12.2	10.8	32.5	30.0	37.5	2.5	5.0	3.8	33.3	66.7
2004	11.1	11.4	12.9	11.8	31.4	32.3	36.4	3.6	4.8	4.2	42.9	57.1
2005	9.0	8.7	7.5	8.4	35.7	34.5	29.8	2.0	4.0	3.0	33.4	66.6
2006	15.6	14.8	16.9	15.8	33.1	31.3	35.7	5.0	6.6	5.8	43.0	57.0
2007	15.6	14.5	20.2	16.7	31.1	28.8	40.1	4.7	6.8	5.7	40.7	59.3
2008	21.1	25.0	24.9	23.7	29.7	35.2	35.1	5.5	10.7	8.1	33.8	66.2

<sup>a</sup> Drift 1 begins at 0800 hours, Drift 2 at 1500 hours, and Drift 3 at 2200 hours. There are 2 drifts (one on each riverbank) in each drift period.

<sup>b</sup> Site N is the North Bank and Site S is the South Bank. The Mean CPUE is the cumulative CPUE for each riverbank for the season divided by the number of drifts on that riverbank during the season.

Appendix C3.–Kobuk River sheefish test fishery comparison, 1997, 1999–2008.

Year	Project Operation Dates	Number of test fish drifts	Number of days off inseason <sup>a</sup>	Rank by number of drifts	Cumulative CPUE	Rank by cumulative CPUE
1997	7/09–8/14	202	3	9	83.43	11
1999	7/11–8/13	176	2	11	310.07	8
2000	7/07–8/14	228	0	3	540.67	5
2001	7/05–8/13	232	0	2	614.77	3
2002	7/05–8/12	218	2	4	277.00	10
2003	7/09–8/13	214	0	6	407.55	7
2004	7/02–8/12	242	0	1	509.25	6
2005	7/07–8/15	207	3	7	306.76	9
2006	7/07–8/19	217	4	5	642.39	2
2007	7/11–8/20	207	6	7	590.37	4
2008	7/09–8/14	200	2	10	821.73	1

<sup>a</sup> Number of days during the season where the crew had the day off and no test fishing occurred.

Appendix C4.–Kobuk River sheefish test fishery mean daily and cumulative CPUE proportions, 1997 and 1999–2008.

Date	1997		1999		2000		2001		2002	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
5 Jul							0.034	0.034	0.108	0.108
6 Jul							0.037	0.070	0.058	0.166
7 Jul					0.045	0.045	0.105	0.175	0.090	0.257
8 Jul					0.063	0.108	0.078	0.253	0.065	0.321
9 Jul	0.000	0.000			0.064	0.172	0.058	0.311	0.086	0.408
10 Jul	0.163	0.163			0.074	0.246	0.055	0.366	0.065	0.472
11 Jul	0.117	0.280	0.081	0.081	0.043	0.289	0.050	0.415	0.059	0.531
12 Jul	0.075	0.356	0.076	0.157	0.042	0.331	0.060	0.476	0.083	0.615
13 Jul	<sup>a</sup>	0.356	0.074	0.231	0.077	0.407	0.036	0.512	0.041	0.655
14 Jul	0.032	0.388	0.085	0.315	0.067	0.474	0.033	0.545	0.028	0.683
15 Jul	0.033	0.421	0.085	0.400	0.048	0.522	0.025	0.570	0.036	0.720
16 Jul	0.053	0.474	0.052	0.452	0.041	0.563	0.025	0.595	0.006	0.725
17 Jul	0.032	0.507	0.047	0.499	0.049	0.612	0.025	0.620	0.006	0.731
18 Jul	0.021	0.528	0.034	0.533	0.048	0.660	0.033	0.653	0.009	0.740
19 Jul	0.000	0.528	0.068	0.601	0.047	0.707	0.027	0.680	0.014	0.754
20 Jul	<sup>a</sup>	0.528	0.068	0.669	0.043	0.750	0.032	0.712	0.008	0.762
21 Jul	0.021	0.549	0.030	0.699	0.026	0.776	0.032	0.743	0.005	0.767
22 Jul	0.011	0.560	0.088	0.787	0.003	0.779	0.003	0.747	0.006	0.773
23 Jul	0.032	0.592	0.020	0.807	0.003	0.782	0.015	0.761	0.005	0.778
24 Jul	0.053	0.645	0.031	0.837	0.008	0.790	0.009	0.771	0.017	0.796
25 Jul	0.032	0.677	0.052	0.889	0.011	0.801	0.022	0.792	0.024	0.820
26 Jul	0.022	0.699	0.016	0.906	0.014	0.815	0.021	0.814	0.005	0.825
27 Jul	0.147	0.846	0.034	0.940	0.014	0.829	0.041	0.854	0.000	0.825
28 Jul	0.071	0.918		<sup>a</sup> 0.940	0.013	0.842	0.014	0.869		<sup>a</sup> 0.825
29 Jul	0.032	0.949	0.000	0.940	0.022	0.864	0.017	0.885	0.018	0.843
30 Jul	0.027	0.976	0.005	0.945	0.026	0.890	0.023	0.909	0.017	0.860
31 Jul	0.010	0.986	0.000	0.945	0.030	0.920	0.023	0.931	0.021	0.882
1 Aug	0.000	0.986	0.003	0.948	0.019	0.939	0.011	0.942	0.006	0.888
2 Aug	0.000	0.986	0.013	0.961	0.012	0.951	0.012	0.954	0.012	0.900
3 Aug	0.000	0.986	0.004	0.965	0.003	0.954	0.009	0.963	0.006	0.906
4 Aug	0.000	0.986	0.016	0.981	0.009	0.962	0.007	0.970		<sup>a</sup> 0.906
5 Aug	0.000	0.986	0.003	0.984	0.007	0.970	0.007	0.977	0.000	0.906
6 Aug	0.000	0.986	0.005	0.989	0.000	0.970	0.009	0.987	0.014	0.920
7 Aug	0.000	0.986	0.011	1.000	0.012	0.982	0.004	0.991	0.009	0.929
8 Aug	0.000	0.986		<sup>a</sup> 1.000	0.008	0.990	0.003	0.993	0.012	0.941
9 Aug	0.000	0.986	0.000	1.000	0.001	0.991	0.003	0.996	0.025	0.966
10 Aug		<sup>a</sup> 0.986	0.000	1.000	0.004	0.995	0.000	0.996	0.015	0.982
11 Aug	0.000	0.986	0.000	1.000	0.001	0.997	0.000	0.996	0.003	0.985
12 Aug	0.000	0.986	0.000	1.000	0.000	0.997	0.000	0.996	0.015	1.000
13 Aug	0.014	1.000	0.000	1.000	0.003	1.000	0.004	1.000		
14 Aug	0.000	1.000			0.000	1.000				
15 Aug										

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Date	2003		2004		2005		2006		2007	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
2 Jul			0.018	0.018						
3 Jul			0.021	0.040						
4 Jul			0.032	0.072						
5 Jul			0.024	0.096						
6 Jul			0.018	0.115						
7 Jul			0.048	0.162	0.037	0.037	0.092	0.092		
8 Jul			0.032	0.194		<sup>a</sup> 0.037	0.084	0.175		
9 Jul	0.149	0.149	0.045	0.239		<sup>a</sup> 0.037	0.062	0.238		
10 Jul	0.136	0.284	0.054	0.294		<sup>a</sup> 0.037	0.087	0.325		
11 Jul	0.078	0.362	0.024	0.317	0.045	0.083	0.094	0.419	0.039	0.039
12 Jul	0.079	0.441	0.027	0.344	0.053	0.136	0.058	0.477	0.021	0.061
13 Jul	0.060	0.501	0.039	0.383	0.056	0.191	0.046	0.523	0.025	0.085
14 Jul	0.022	0.523	0.006	0.389	0.077	0.268	0.074	0.597	0.019	0.104
15 Jul	0.026	0.549	0.017	0.406	0.057	0.325	0.055	0.652		<sup>a</sup> 0.104
16 Jul	0.021	0.569	0.003	0.409	0.082	0.407	0.031	0.683	0.018	0.122
17 Jul	0.019	0.588	0.005	0.413	0.053	0.460	0.055	0.737	0.024	0.146
18 Jul	0.036	0.624	0.030	0.444	0.050	0.510	0.053	0.790	0.018	0.163
19 Jul	0.028	0.652	0.029	0.472	0.036	0.545	0.009	0.798	0.035	0.198
20 Jul	0.028	0.681	0.007	0.479	0.027	0.573		<sup>a</sup> 0.798	0.046	0.244
21 Jul	0.029	0.710	0.016	0.496	0.057	0.629	0.004	0.802	0.045	0.290
22 Jul	0.040	0.749	0.041	0.537	0.042	0.671	0.000	0.802		<sup>a</sup> 0.290
23 Jul	0.022	0.771	0.022	0.559	0.041	0.713	0.019	0.821	0.063	0.352
24 Jul	0.013	0.784	0.027	0.586	0.027	0.740	0.038	0.859	0.066	0.418
25 Jul	0.016	0.800	0.018	0.604	0.002	0.742	0.010	0.869	0.042	0.460
26 Jul	0.008	0.808	0.016	0.620	0.027	0.769	0.014	0.882	0.036	0.496
27 Jul	0.023	0.831	0.012	0.632	0.020	0.789	0.015	0.897	0.007	0.503
28 Jul	0.013	0.843	0.027	0.659	0.015	0.804	0.022	0.920	0.005	0.508
29 Jul	0.005	0.848	0.006	0.665	0.000	0.804	0.013	0.933		<sup>a</sup> 0.508
30 Jul	0.016	0.865	0.001	0.667	0.007	0.811	0.005	0.938	0.034	0.542
31 Jul	0.031	0.896	0.010	0.677	0.013	0.824	0.004	0.942	0.014	0.557
1 Aug	0.033	0.929	0.010	0.688	0.010	0.833	0.000	0.942	0.025	0.582
2 Aug	0.015	0.945	0.037	0.724	0.007	0.840	0.005	0.946	0.032	0.614
3 Aug	0.016	0.961	0.049	0.774	0.031	0.871	0.005	0.951	0.017	0.631
4 Aug	0.020	0.981	0.029	0.803	0.010	0.881	0.011	0.963	0.062	0.693
5 Aug	0.006	0.987	0.027	0.830	0.010	0.891	0.010	0.972		<sup>a</sup> 0.693
6 Aug	0.000	0.987	0.028	0.859	0.005	0.896	0.007	0.980	0.048	0.741
7 Aug	0.003	0.990	0.017	0.875	0.015	0.911	0.004	0.983	0.028	0.769
8 Aug	0.002	0.991	0.008	0.884	0.026	0.937	0.002	0.986	0.040	0.809
9 Aug	0.004	0.995	0.043	0.926	0.025	0.962	0.001	0.987	0.030	0.839
10 Aug	0.000	0.995	0.011	0.937	0.023	0.985	0.004	0.991	0.026	0.865
11 Aug	0.000	0.995	0.034	0.971	0.000	0.985		<sup>a</sup> 0.991	0.028	0.893
12 Aug	0.002	0.997	0.029	1.000	0.003	0.988		<sup>a</sup> 0.991		<sup>a</sup> 0.893
13 Aug	0.003	1.000			0.009	0.997		<sup>a</sup> 0.991	0.035	0.928
14 Aug	0.000	1.000			0.003	1.000	0.002	0.992	0.015	0.942
15 Aug					0.000	1.000	0.001	0.994	0.015	0.957
16 Aug							0.000	0.994	0.008	0.965
17 Aug							0.001	0.995	0.011	0.976
18 Aug							0.005	1.000	0.018	0.994
19 Aug							0.000	1.000		<sup>a</sup> 0.994
20 Aug									0.006	1.000

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Date	2008	
	Daily	Cum.
9 Jul	0.042	0.042
10 Jul	0.034	0.076
11 Jul	0.052	0.129
12 Jul	0.056	0.185
13 Jul	<sup>a</sup>	0.185
14 Jul	0.056	0.241
15 Jul	0.038	0.279
16 Jul	0.040	0.319
17 Jul	0.078	0.397
18 Jul	0.083	0.480
19 Jul	0.040	0.520
20 Jul	<sup>a</sup>	0.520
21 Jul	0.015	0.535
22 Jul	0.032	0.567
23 Jul	0.055	0.622
24 Jul	0.047	0.669
25 Jul	0.049	0.718
26 Jul	0.041	0.759
27 Jul	0.082	0.841
28 Jul	0.031	0.872
29 Jul	0.024	0.896
30 Jul	0.027	0.923
31 Jul	0.021	0.944
1 Aug	0.009	0.953
2 Aug	0.004	0.956
3 Aug	0.012	0.969
4 Aug	0.021	0.990
5 Aug	0.004	0.994
6 Aug	0.000	0.994
7 Aug	0.002	0.995
8 Aug	0.003	0.999
9 Aug	0.001	1.000
10 Aug	0.000	1.000
11 Aug	0.000	1.000
12 Aug	0.000	1.000
13 Aug	0.000	1.000
14 Aug	0.000	1.000
15 Aug		
16 Aug		
17 Aug		
18 Aug		
19 Aug		
20 Aug		

*Note:* Blank cells indicate no data.

<sup>a</sup> Day off