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**Norton Sound and Kotzebue Sound Management Area
Salmon Catch and Escapement Report, 1991**

by

Tracy Lingnau

The Technical Fishery Report Series was established in 1987, replacing the Technical Data Report Series. The scope of this new series has been broadened to include reports that may contain data analysis, although data oriented reports lacking substantial analysis will continue to be included. The new series maintains an emphasis on timely reporting of recently gathered information, and this may sometimes require use of data subject to minor future adjustments. Reports published in this series are generally interim, annual, or iterative rather than final reports summarizing a completed study or project. They are technically oriented and intended for use primarily by fishery professionals and technically oriented fishing industry representatives. Publications in this series have received several editorial reviews and at least one *blind* peer review refereed by the division's editor and have been determined to be consistent with the division's publication policies and standards.

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ABSTRACT

The 1991 commercial and subsistence harvest, and escapement samples of the five species of Pacific salmon *Oncorhynchus* found in the Norton Sound and Kotzebue Sound Management Areas are presented by age, sex, and length. The 1991 Norton Sound District commercial harvest totaled 156,789 salmon and was composed of 6,068 chinook *O. tshawytscha*, 86,871 chum *O. keta*, 203 sockeye *O. nerka*, and 63,647 coho *O. kisutch* salmon. The commercial harvest was 5% below the 1986-90 average for chinook salmon, 7% below for chum salmon, and 61% above for coho salmon. There were no reported commercial catches of pink *O. gorbuscha* salmon in 1991. Sockeye salmon are only present in small numbers in this area. Aerial surveys in southern Norton Sound subdistricts indicated that escapements were average or above average for chum and coho salmon. Escapement surveys of the northern subdistricts were below average for chum salmon, but coho salmon escapements appeared to be above average. The age composition of the chinook salmon harvest in Subdistrict 6 was composed of three major age classes: age 1.4 (36.6%), age 1.3 (35.4%), and age 1.2 component was slightly less (26.2%). Subdistrict 6 chum salmon age composition was 66.3% age 0.3 and 33.3% age 0.4. The coho salmon harvest in Subdistrict 6 was predominantly age 2.1 (87.7%). In the Kotzebue District the commercial harvest totaled 239,923 chum salmon. An incidental catch of 44 chinook salmon and 6,136 Dolly Varden was also reported. Subsistence catches of whitefish and sheefish also occur in the Kotzebue District. The chum salmon harvest was below the recent 1979-90 average of 313,577 fish. Aerial surveys of both the Noatak and Kobuk drainage indicated that escapement objectives were met. Data from a test fishery on the Noatak River indicated that escapement to that system in 1991 was down from previous years. However due to water clarity, I suspect net avoidance may have contributed to the low catch per unit effort (CPUE). The age composition of the chum salmon harvest in the Kotzebue District commercial fishery was 2.9% age 0.2, 60.4% age 0.3, 35.8% age 0.4, and 0.9% age 0.5.

KEY WORDS: Norton Sound, Kotzebue Sound, harvest, escapement, *Oncorhynchus tshawytscha*, *O. nerka*, *O. keta*, *O. kisutch*, *O. gorbuscha*, age-size-sex composition, fishery synopsis

INTRODUCTION

The Norton Sound, Port Clarence, and Kotzebue Sound commercial salmon management districts include all waters of Alaska from Canal Point Light, south of Stebbins, to Point Hope, north of Kotzebue. The Port Clarence District has been closed to commercial salmon fishing since 1966. The Norton Sound District is composed of all waters of Alaska from Canal Point Light north to Cape Douglas (Figure 1) and consists of six subdistricts: 1 (Nome), 2 (Golovin), 3 (Moses Point), 4 (Norton Bay), 5 (Shaktoolik), and 6 (Unalakleet). The Kotzebue Sound District includes all waters of Alaska from Point Hope to Cape Prince of Wales, but commercial salmon fishing is restricted to Subdistricts 1 and 2, consisting of ocean waters north of the Baldwin Peninsula (Figures 2, 3). Subdistrict 2, Noatak River mouth, normally remains closed unless the chum salmon return is substantially above average.

Five species of Pacific salmon are found in the Norton and Kotzebue Sound areas. In descending order of economic importance i.e., average exvessel value, they are chum salmon *Oncorhynchus keta*, chinook salmon *O. tshawytscha*, coho salmon *O. kisutch*, pink salmon *O. gorbuscha*, and sockeye salmon *O. nerka*. In Norton Sound the even-year returns of pink salmon are the largest of the five species, followed by chum, coho, chinook, and sockeye salmon. In the Kotzebue Sound District, chum salmon are the predominant species.

Knowledge of the magnitude, distribution, timing, and age-sex-size composition of both the harvest and escapement by stock is fundamental to managing salmon fisheries and achieving full production: salmon recruitment is directly related to the number of fish in each age, sex, and size category of the spawning population. Age, sex, and size composition of selected harvests and escapements in the Norton and Kotzebue Sound areas have been estimated annually since 1962 and are presented in this report for 1991.

Fishery statistics for the Norton Sound and Kotzebue Sound Districts are available from several additional sources. Commercial and subsistence harvest and spawning escapement data from 1961 to 1990 have been summarized in Lean et al. (1992). In addition, the results from escapement assessment projects are analyzed and reported annually. For the 1991 season these included test fishery projects on the Unalakleet River (Lean, personal communication) and Noatak River (Lingnau 1991) and a counting tower project on the Kwiniuk River (B. Bue, Division of Commercial Fisheries, Anchorage, personal communication).

Age, sex, and size data for Norton Sound and Kotzebue Sound from 1962 to 1982 are summarized in an unpublished report series entitled ADF&G Arctic-Yukon-Kuskokwim Region Age-Sex-Size Composition of Salmon. Beginning with the 1983 season these data have been published in an annual report (Lean et al. 1984, 1991; Bigler and Lean 1986; Hamner 1987, 1989a, 1989b; Blaney *in press*; Buklis 1988, 1989).

METHODS

Harvest and Escapement

Commercial catch data presented in this report were compiled from harvest receipts, i.e., *fish tickets*, which document each sale by a licensed fisherman. These data were summarized by microcomputer in the Nome and Kotzebue offices during the season.

Subsistence catches have not been monitored as closely as commercial catches in the Norton Sound and Kotzebue Sound Areas. Due to budget constraints, no subsistence harvest surveys were conducted in the Norton Sound area in 1991. A subsistence permit is required to subsistence fish in the Nome Subdistrict, and catch limits are set by permit for each river and species. In the Kotzebue Area household interviews were conducted in the villages of Noatak, Noorvik, and Shungnak. The members of each household were asked how many fish of each species were caught for subsistence use. During these surveys it was assumed that fishermen could accurately recall their harvests, which may have occurred over several weeks.

Aerial surveys have been the primary method for monitoring salmon escapements to the Norton Sound and Kotzebue Sound drainages, but they do not provide a total enumeration of salmon spawning abundance. Aerial survey escapement counts are, at best an index of relative abundance for the surveyed streams. To compare aerial surveys across years, surveys should be conducted on approximately the same dates each year under similar survey conditions and at the same locations. Comparing commercial catch statistics to previous years provides an index of run strength and timing. Test fishing also provides an index of escapement and species composition for turbid or large drainages that are difficult to monitor visually. Test fishery catch and catch per unit effort (CPUE) statistics are used as an index of relative abundance, but counting towers provide a better estimate of escapement. Both provide data on migratory timing. In 1991 a counting tower on the Kwiniuk River in the Moses Point Subdistrict, and test fishing projects on the Unalakleet River in the Unalakleet Subdistrict and the Noatak River in the Kotzebue District, were used to monitor escapements. A sonar project on the Noatak River completed its third year of research and development in 1991.

Age, Sex, and Length Data Collection

Age was determined from scales removed from the left side of the fish in an area above the lateral line crossed by a diagonal from the posterior insertion of the dorsal fin to the anterior insertion of the anal fin. Scales were mounted on gum cards and impressions made in cellulose acetate. Ages were reported in European notation: the first digit refers to the freshwater age and does not include the year spent in the gravel; the second digit refers to the ocean age. Sex was determined by examining external characteristics

such as snout, vent, body symmetry, extruded eggs, ovipositor or milt of live fish. The sex of dead fish was determined by examining the gonads, if necessary. Fish length from mid-eye to fork-of-tail was measured to the nearest millimeter.

In some cases sex and length data but no ageable scales were obtained from fish, and in other cases ageable scales were collected without corresponding sex or length data. Therefore, numbers of fish in a length-by-age summary table may differ from numbers of fish in a sex-by-age summary table for a given fishery or escapement sample.

Sample Size

We derived minimum sample size goals within temporal strata for 1991 in a manner different from prior years, resulting in substantially reduced sample size requirements. Specifically, we changed the recommended levels of accuracy and precision, as well as the method of assigning variance to age classes. The objective was to obtain an estimated proportion of each major age class within 10% of the true proportion 95% of the time. This resulted in a sample size goal of 128 scales per strata regardless of the number of age classes expected. In practice, sample sizes were increased because some scales are expected to be unreadable. When the total number of readable samples collected was less than the goal, data from several strata were pooled and a standard error of the mean was calculated.

RESULTS

Commercial fishery samples were collected in sufficient numbers to estimate age and sex composition of the harvest for chinook and chum salmon in Norton Sound Subdistricts 3, 5, and 6; for coho salmon in Norton Sound Subdistrict 6; and for chum salmon in the Kotzebue District. Chinook, chum, and coho salmon were sampled from the Unalakleet River set gillnet test fishing catch, and chum salmon were sampled from the Noatak River drift gillnet test fish catch. Because of the selectivity of the 5-7/8 in (149 mm) stretched-mesh gillnets used on these two projects, the samples are not an unbiased source of spawning escapement age, sex, and size composition. Kotzebue Sound chum salmon escapement samples were collected from the Noatak River spawning grounds by beach seine. Carcasses were collected from the Squirrel and Salmon Rivers of the Kobuk River drainage.

Comparisons of age, sex, and size composition were not substantiated by statistical testing.

Norton Sound

Commercial and Subsistence Harvest

The 1991 Norton Sound commercial harvest totaled 156,789 salmon and was composed of 6,068 chinook, 86,871 chum, 203 sockeye, and 63,647 coho salmon (Table 1; Appendix A). Effort and harvest were below average due to a lack of salmon buyers during most of the season in the four northern subdistricts and poor chum returns in Subdistricts 1, 2, and 3. Subdistrict 6 accounted for 61.4% of the total salmon harvest in 1991, followed by Subdistrict 5 (28.5%), Subdistrict 2 (9.5%), and Subdistrict 3 (0.6%).

The chinook salmon harvest was 5% below the 1986-90 average and composed 3.9% of the district's total salmon harvest. Most fishermen in the Unalakleet (6) and Shaktoolik (5) Subdistricts target on chinook salmon from the opening of the season in the first part of June until mid-June using set gillnets with 8-1/4 in (210-mm) stretched mesh. During this portion of the season fishing in these two subdistricts were reduced to 24-h from the normal 48-h to provide for adequate chinook escapements. North of the Shaktoolik Subdistrict, fishermen typically use 5-7/8 in mesh gillnets throughout the fishing season and target on chum salmon, and chinook salmon are harvested incidentally. In Norton Sound chum salmon is normally the most important species economically, i.e., has the highest exvessel value; in 1991 it composed 55.4% of the district's total harvest. However, because of low chum prices, coho salmon had a higher exvessel value than chum salmon for this year. In addition, the 1991 harvest of chum salmon was 7% below the 1986-90 average. The coho salmon harvest was 61% above the 1986-90 average and accounted for 41% of the district's total salmon catch and nearly 40% of the exvessel value for Norton Sound. Pink salmon returns in Norton Sound follow an even-year cycle of high abundance, and none were sold in 1991. Sockeye salmon are harvested in small numbers incidentally during the chum fishery, and 203 were caught in 1991.

An expected low return of chum salmon prompted an emergency closure from July 1 to August 1 in Subdistrict 1. Closure action was also taken for subsistence fishing from June 16 to July 24 in some areas and to July 31 in other. Sport fishing for chum salmon was closed throughout the season. Subdistrict 2 was limited by a lack of buyers and poor escapement. A domestic buyer purchased fish for five periods. The area manager was preparing to close the commercial chum salmon season when the buyer ceased operation. Commercial fishing was opened for only one period in Subdistrict 3 before being closed by emergency order because the department's counting tower on the Kwiniuk River indicated that the chum salmon escapement was late. Although the subdistrict was later reopened, no additional salmon were harvested due to the lack of a buyer.

During the beginning of the season Subdistricts 5 and 6 were open for the normal 48-h fishing periods. An emergency order closed Subdistrict 5 and 6 for 6 d to allow chum salmon passage to spawning streams. The season closed by regulation on September 7. The same commercial fishing schedule was used in Subdistrict 5 and 6 because of their close proximity and the difficulty in obtaining timely escapement information. No salmon were commercially harvested in Subdistrict 4 due to the lack of a buyer.

Although many of the 13,000 residents of the Norton Sound Area are dependent or semi-dependent on the fish and game resources of the area, subsistence catches have not been monitored since 1983 except in the Nome Subdistrict. Prior to 1983 the department conducted annual household surveys in many of the area's villages. For the last 5 years in which thorough surveys were conducted, 1978-1982, the average annual subsistence catch in the Norton Sound area was 73,000 salmon for all species combined. Because not all fishermen were contacted, this should be considered a minimum estimate. In the Nome Subdistrict, subsistence permits require that fishermen document their harvest by species. There were 155 subsistence permits issued in 1991. A total of 93 permit holders fished; they reported a harvest of 5,437 salmon composed of 83 chinook, 3,715 chum, 194 pink, 166 sockeye, and 1,279 coho salmon (Table 2).

Escapement Abundance

Subdistricts 5 and 6 support the largest chinook salmon returns in Norton Sound. Subdistricts 1, 2, 3, and 4 have had increasing returns in recent years. Escapement surveys indicated average to above-average numbers of chinook salmon in most streams throughout the district, whereas the department test fishery in the Unalakleet River and commercial catch data indicated that the chinook return was slightly below average.

Chum salmon escapements in Subdistrict 1 were much larger than the previous two seasons because of emergency order closures. Escapements in both Subdistricts 2 and 3 were below average and did not meet escapement goals. Aerial survey escapement indices of southern Norton Sound Subdistricts 4, 5, and 6 were at or above average.

Coho salmon are found in nearly all of the chum salmon producing streams in Norton Sound; the Unalakleet and Shaktoolik River systems support the largest populations. The overall coho salmon escapements appeared to be average; most index streams surveyed in Norton Sound were at or above average except Ophir Creek and Eldorado River.

Age, Sex, and Length Composition

Chinook salmon commercial harvest in Subdistrict 6 was estimated to be composed of 36.6% age-1.4, 35.4% age-1.3, and 26.2% age-1.2 fish; fish aged 2.3, 1.5, 2.4, and 2.5 contributed smaller percentages (Table 4). Females contributed 47.6% to the harvest. A small sample from the Subdistrict 5 commercial harvest had a similar age composition (Table 4). A sample of only 27 salmon from Subdistrict 3 was quite dissimilar: with 51.9% age 1.4 and 29.6% age 1.3. A sample of 32 chinook salmon from the Unalakleet River test fishery was 46.9% age 1.2 and 25.0% age 1.4, 71.9% of the total being female (Table 6). Mean lengths by age group for all samples collected ranged from 545 mm for age-1.2 males from Unalakleet River test fish samples to 1,020 mm for an age-1.5 male from the Subdistrict 6 commercial fishery sample (Tables 5 and 6).

Age-0.4 chum salmon dominated both Subdistrict 3 (58.7%) and 5 (58.9%), followed by age-0.3, which made up 41.3% of Subdistrict 3 and 37.5% of Subdistrict 5. Subdistrict 6 age composition, on the other hand, was mostly age-0.3 (66.3%), followed by age-0.4 (33.3%; Table 7). Males were dominant in all subdistricts sampled and composed 52.6% of the total. A sample of 738 chum salmon from the Unalakleet River test fishery was 70.3% age 0.3 and 29.0% age 0.4, 48.6% of the sample, being female (Table 9). Mean lengths by age group for all samples collected ranged from 555 mm for age-0.3 females to 625 mm for age-0.5 males, both from the Subdistrict 6 commercial fishery sample (Tables 8, 9).

Subdistrict 6 coho salmon samples were dominated by age-2.1 fish (89.5%) and had a near equal male/female sex ratio (Table 10). There were 167 coho salmon caught in the Unalakleet River test fishery, and the age composition of this sample differed from the Subdistrict 6 catch: only 73.0% were age-2.1 salmon, followed by age-1.1 (22.2%) and age 3.1 (4.8%; Table 11). Mean lengths by age group for all samples collected ranged from 557 mm for an age-3.1 male coho salmon from Subdistrict 6 to 609 mm for age-1.1 males in the Unalakleet River test fishery (Table 11).

Kotzebue Sound

Commercial and Subsistence Harvest

The 1991 commercial harvest in the Kotzebue District totaled 239,923 chum salmon, 44 chinook salmon, and 6,136 Dolly Varden (Table 12). The chum salmon harvest was 31% below the 1979-90 average of 313,577 fish. Gear was limited to set nets having an aggregate of no more than 150 fathoms (274 m) per fisherman. Most fishermen operated with one end on or near shore and with all three shackles connected. Most gear used in the district is 5-7/8 in stretch multi-filament gillnet.

The Kotzebue Sound commercial season began on July 11. The first three periods were 24 h, and harvest rates were below the recent 12-year average. Therefore, the fourth fishing period was also left at 24 h. The fourth period catch and catch rate was above average, indicating a normal run strength which warranted a standard fishing schedule. The next 5 commercial openings were extended to 36 h. Catch rates of periods 5 through 8 were average, but total salmon catches were lower than average due to below-average fishing effort. Although a decrease in catch and catch rates in period 9 caused concern, and the following period was reduced to 24 h, period 10 had the second highest catch rate for the past 12 years. This indicated that a large pulse of fish was moving through, that escapement goals would be met, and that fishing time could be increased. Fishing periods were again increased to 48 h until the end of the season. During these periods both catch and catch rates were at or slightly above average.

Door-to-door interviews with subsistence fishermen were conducted in the villages of Noorvik and Shungnak on the Kobuk River and in the village of Noatak on the Noatak River. Estimated chum salmon subsistence harvests totalled 6,855 in Noorvik, 4,248 in Shungnak, and 3,777 in Noatak (Table 13). These do not represent the total subsistence harvest estimates for the Kotzebue Sound area, because

harvests were not expanded in these villages to estimate for households not interviewed and because Kotzebue and several other communities which harvest chum salmon for subsistence use were not surveyed.

Escapement Abundance

Excellent weather conditions prevailed during 1991 for aerial surveys in the Kotzebue District. Peak surveys indicated that escapement objectives goals were met in both the Noatak and Kobuk River drainage (Table 14). Data from a test fish project on the Noatak River indicated that escapement to that system was substantially below average; water clarity was thought to have increased net avoidance by salmon. A sonar project in preliminary operation on the Noatak River indicated that escapement objectives were met.

Age, Sex, and Length Composition

Sufficient commercial fishery catch samples were collected to stratify the season by fishing period (Appendix C.1). As in previous years, a shift in age composition through the season was noted for 1991, age 0.4 decreasing and age 0.3 increasing as the season progressed. For the first fishing period, 67.1% of the catch was age 0.4 and 28.9% was age 0.3, whereas samples from the last period indicated 25.3% of the catch was age 0.4 and 70.5% was age 0.3. Although age-0.2 and age-0.5 fish typically contribute only a small percentage each year, age-0.2 fish composed less than one-third of the typical contribution for the season. The chum salmon commercial harvest for the entire season was composed of 60.4% age-0.3, 35.8% age-0.4, 2.9% age-0.2, and 0.9% age-0.5 fish (Table 15). Females were estimated to have contributed 53.6% to the harvest.

Samples collected from the test fishery located in the lower Noatak River using 5-7/8 in mesh gillnets were similar to commercial catch samples: 64.2% age-0.3, 33.2% age-0.4, 1.9% age-0.2, and 0.7% age-0.5 fish (Table 16). Spawning ground samples collected for chum salmon from the Noatak River and the Squirrel and Salmon Rivers of the Kobuk River drainage were also very similar to each other, age 0.4 ranging from 70.5% to 75.0% and age 0.5 ranging from 19.4% to 24.2% (Table 17). Mean lengths by age group for all escapement and test net samples ranged from 535 mm for age-0.3 females from Noatak River beach seine samples to 657 mm for age-0.5 females from test fish samples (Table 16, 18).

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Table 1. Norton Sound commercial salmon effort and catch by subdistrict, 1991.

Subdistrict	Number of Fishermen	Number of Fish				Total
		Chinook	Sockeye	Coho	Chum	
1	0	0	0	0	0	0
2	16	49	1	0	14,839	14,889
3	24	161	0	0	804	965
4	0	0	0	0	0	0
5	25	1,324	55	11,614	31,619	44,612
6	75	4,534	147	52,033	39,609	96,323
District Totals	126	6,068	203	63,647	86,871	156,789

Table 2. Norton Sound subsistence salmon catch and effort in the Nome area, 1991, compiled by the Division of Subsistence.

Location	Permits Issued ^a	Permits Returned	Permits Fished	Chinook	Sockeye	Coho	Pink	Chum	Total
Marine Waters	76	63	48	69	41	628	111	3,143	3,992
Nome River	16	13	13	1	7	203	48	84	343
Snake River	6	4	3	0	0	41	1	6	48
Eldorado Flambeau	11	9	5	3	4	198	9	325	539
Bonanza River	8	8	7	0	0	114	0	10	124
Solomon River	4	2	1	2	4	12	0	29	47
Safety Sound	1	1	1	0	0	44	0	0	44
Sinuk River	0	0	0	0	0	0	0	0	0
Other Rivers ^b	1	1	1	0	0	5	0	20	25
Port Clarence ^c	26	21	14	8	110	34	25	98	275
Unknown Rivers ^d	6	6	0	0	0	0	0	0	0
Totals	155	128	93	83	166	1,279	194	3,715	5,437

^a Permits issued by Alaska Department of Fish and Game, Division of Commercial Fisheries, in Nome.

^b Includes the Penny, Cripple, Feather, Niukluk and Fish Rivers.

^c Includes the Kuzitrin and Pilgrim Rivers.

^d Include data for which original permits or permit lists have been lost.

Table 3. Norton Sound salmon aerial survey escapement counts by species for 1991 with survey count objectives for chum salmon.

Location or Subdistrict	River / Lake	Chinook	Sockeye	Coho	Pink	Chum		
						Count	Objective	
Port Clarence 1	Grand Central R.		1,520					
	Salmon L.		4,173					
	Pilgrim R.	5			103			
	Sinuk R.	3		701	14,680	5,420	4,500	
	Glacial L.		2,141					
	Cripple C.			195	470	2,090		
	Penny R.			60	300			
	Snake R.				190	772	1,000	
	Nome R.	9		611	4,690	3,520	2,000	
	Flambeau R.	2			570	1,564	3,250	
2	Eldorado R.	76		98	1,590	5,755	5,250	
	Bonanza R.				2,980	1,520	1,500	
	Solomon R.			171	3,640	830	550	
	Fish R.	58			51,190	10,470	17,500	
	Niukluk R.	24		1,783	37,410	10,660	8,000	
	Ophir C.			60				
	Boston C.	152			3,210	2,550	2,500	
	3	Kwiniuk R.	587 ^a		809	54,591 ^a	18,802 ^a	25,000 ^b
		Tubutulik R.	661			26,870	7,085	12,000
	4	Inglutalik R.	551			94,100	16,250	
Ungalik R.		151		418	152,900	10,050		
5	Shaktoolik R.	730		3,427	208,070	7,405	11,000	
		1,244		7,396	44,300	4,225		
6	Unalakleet R.							
	North R.	656		2,510	118,720	2,435	2,500	
	Old Woman R.	389		1,530	1,964	990	2,000	
St. Michael/ Stebbins	Kogok R.	177		620		1,350		
	Pikmiktalik R.	154	1,202	2,480		1,360		

^a Preliminary expanded tower counts.

^b Chum objective is for tower count.

Table 4. Norton Sound chinook salmon commercial catch age and sex composition by subdistrict, 1991.

		Brood Year and Age Group							Total
		1987	1986	1985		1984		1983	
		1.2	1.3	1.4	2.3	1.5	2.4	2.5	
Subdistrict 3									
Stratum Dates:		6/24-6/25							
Sampling Dates:		6/24							
Sample Size:		27							
Female	Percent of Sample	7.4	3.7	22.2	0.0	0.0	0.0	0.0	33.3
	Number in Catch	12	6	36	0	0	0	0	54
Male	Percent of Sample	7.4	25.9	29.6	0.0	3.7	0.0	0.0	66.7
	Number in Catch	12	42	48	0	6	0	0	107
Total	Percent of Sample	14.8	29.6	51.9	0.0	3.7	0.0	0.0	100.0
	Number in Catch	24	48	83	0	6	0	0	161
	Standard Error	11	14	16		6			
Subdistrict 5									
Stratum Dates:		6/17-8/21							
Sampling Dates:		6/21 & 6/28							
Sample Size:		66							
Female	Percent of Sample	10.6	18.2	27.3	0.0	1.5	0.0	0.0	57.6
	Number in Catch	140	241	361	0	20	0	0	762
Male	Percent of Sample	12.1	21.2	9.1	0.0	0.0	0.0	0.0	42.4
	Number in Catch	160	281	120	0	0	0	0	562
Total	Percent of Sample	22.7	39.4	36.4	0.0	1.5	0.0	0.0	100.0
	Number in Catch	301	522	481	0	20	0	0	1,324
	Standard Error	69	80	79		20			
Subdistrict 6									
Stratum Dates:		6/17-8/30							
Sampling Dates:		6/18-6/28							
Sample Size:		164							
Female	Percent of Sample	6.1	16.5	23.2	0.0	0.6	0.6	0.6	47.6
	Number in Catch	276	748	1,050	0	28	28	28	2,157
Male	Percent of Sample	20.1	18.9	13.4	0.0	0.0	0.0	0.0	52.4
	Number in Catch	912	857	608	0	0	0	0	2,377
Total	Percent of Sample	26.2	35.4	36.6	0.0	0.6	0.6	0.6	100.0
	Number in Catch	1,188	1,604	1,658	0	28	28	28	4,534
	Standard Error	156	170	171	0	28	28	28	

Table 5. Norton Sound chinook salmon commercial catch mean length (mm) by age and sex, 1991.

		1987	1986	Brood Year and Age Group 1985		1984		1983
		1.2	1.3	1.4	2.3	1.5	2.4	2.5
Subdistrict 3								
Females	Mean Length ^a	537.5	743.0	865.0				
	Std. Error	15.5	0.0	19.0				
	Sample Size	2	1	5	0	0	0	0
Males	Mean Length	521.5	750.3	848.6		894.0		
	Std. Error	12.5	38.8	18.6		0.0		
	Sample Size	2	7	7	0	1	0	0
All Fish	Mean Length	529.5	749.4	855.4		894.0		
	Std. Error	9.4	33.6	13.1		0.0		
	Sample Size	4	8	12	0	1	0	0
Subdistrict 5								
Females	Mean Length	598.3	743.1	864.6		930.0		
	Std. Error	12.1	22.7	10.1		0.0		
	Sample Size	7	12	18	0	1	0	0
Males	Mean Length	540.6	740.7	850.8				
	Std. Error	10.0	24.8	16.8				
	Sample Size	8	14	6	0	0	0	0
All Fish	Mean Length	567.5	741.8	861.2		930.0		
	Std. Error	10.7	16.6	8.6		0.0		
	Sample Size	15	26	24	0	1	0	0
Subdistrict 6								
Females	Mean Length	528.5	740.5	859.1		850.0	955.0	950.0
	Std. Error	13.7	21.0	8.1		0.0	0.0	0.0
	Sample Size	10	24	38	0	1	1	1
Males	Mean Length	550.9	725.0	865.1		1,020.0		
	Std. Error	11.1	14.0	16.1		0.0		
	Sample Size	33	30	21	0	1	0	0
All Fish	Mean Length	545.7	731.9	861.2		935.0	955.0	950.0
	Std. Error	9.2	12.1	7.7		85.0	0.0	0.0
	Sample Size	43	54	59	0	2	1	1

^a Length was mid-eye to fork-of-tail.

Table 6. Unalakleet River chinook salmon test fish age and sex composition, and mean length (mm) 1991.

		Brood Year and Age Group ^a					Total
		1987	1986	1985		1984	
		1.2	1.3	1.4	2.3	1.5	
Stratum Dates:		6/10-8/30					
Sampling Dates:		6/10-8/30					
Female	Percent of Sample	25.0	15.6	25.0	3.1	3.1	71.9
	Sample Size	8	5	8	1	1	23
	Mean Length ^b	579.0	736.0	813.6	660.0	840.0	
	Standard Error	11.2	50.3	32.8	0.0	0.0	
Male	Percent of Sample	21.9	3.1	0.0	0.0	3.1	28.1
	Sample Size	7	1	0	0	1	9
	Mean Length	545.0	675.0			965.0	
	Standard Error	14.9	0.0	0	0	0.0	
Total	Percent of Sample	46.9	18.8	25.0	3.1	6.3	100.0
	Sample Size	15	6	8	1	2	32
	Standard Error	9	7	8	3	4	
	Mean Length	563.1	725.8	813.6	660.0	902.5	
	Standard Error	9.9	42.3	32.8	0.0	62.5	

^a Gill net mesh size was 5-7/8 in.

^b Length was from mid-eye to fork-of-tail.

Table 7. Norton Sound chum salmon commercial catch age and sex composition by subdistrict, 1991.

		Brood Year and Age Group			
		1987	1986	1985	
		0.3	0.4	0.5	Total
Subdistrict 3					
Stratum Dates:	6/24-6/25				
Sampling Dates:	6/24				
Sample Size:	46				
Female	Percent of Sample	17.4	21.7	0.0	39.1
	Number in Catch	140	175	0	315
Male	Percent of Sample	23.9	37.0	0.0	60.9
	Number in Catch	192	297	0	489
Total	Percent of Sample	41.3	58.7	0.0	100.0
	Number in Catch	332	472	0	804
	Standard Error	59	59		
Subdistrict 5					
Stratum Dates:	6/17-8/21				
Sampling Dates:	6/28				
Sample Size:	56				
Female	Percent of Sample	10.7	30.4	1.8	42.9
	Number in Catch	3,388	9,599	565	13,551
Male	Percent of Sample	26.8	28.6	1.8	57.1
	Number in Catch	8,469	9,034	565	18,068
Total	Percent of Sample	37.5	58.9	3.6	100.0
	Number in Catch	11,857	18,633	1,129	31,619
	Standard Error	2,064	2,097	791	
Subdistrict 6					
Stratum Dates:	6/17-9/07				
Sampling Dates:	6/28-8/02				
Sample Size:	463				
Female	Percent of Sample	31.7	16.0	0.0	47.7
	Number in Catch	12,576	6,331	0	18,906
Male	Percent of Sample	34.6	17.3	0.4	52.3
	Number in Catch	13,688	6,844	171	20,703
Total	Percent of Sample	66.3	33.3	0.4	100.0
	Number in Catch	26,263	13,174	171	39,609
	Standard Error	871	868	121	

Table 8. Norton Sound chum salmon commercial catch mean length (mm) by age and sex, 1991.

		Brood Year and Age Group		
		1987	1986	1985
		0.3	0.4	0.5
Subdistrict 3				
Females	Mean Length ^a	566.1	582.5	
	Std. Error	6.0	4.8	
	Sample Size	8	10	
Males	Mean Length	600.5	601.5	
	Std. Error	11.0	6.8	
	Sample Size	11	17	
All Fish	Mean Length	586.0	594.4	
	Std. Error	7.8	4.9	
	Sample Size	19	27	
Subdistrict 5				
Females	Mean Length	575.3	592.4	602.0
	Std. Error	7.8	4.9	0.0
	Sample Size	6	17	1
Males	Mean Length	591.3	596.1	625.0
	Std. Error	3.2	5.3	0.0
	Sample Size	15	16	1
All Fish	Mean Length	586.8	594.2	613.5
	Std. Error	3.5	3.6	11.5
	Sample Size	21	33	2
Subdistrict 6				
Females	Mean Length	555.4	571.7	
	Std. Error	1.9	3.2	
	Sample Size	147	74	
Males	Mean Length	573.2	583.8	605.0
	Std. Error	2.5	3.4	20.0
	Sample Size	160	80	2
All Fish	Mean Length	564.7	578.0	605.0
	Std. Error	1.7	2.4	20.0
	Sample Size	307	154	2

^a Length was from mid-eye to fork-of-tail.

Table 9. Unalakleet River chum salmon test fish age and sex composition, and mean length (mm), 1991.

		Brood Year and Age Group				
		1988	1987	1986	1985	Total
		0.2	0.3	0.4	0.5	
Stratum Dates:		6/16-9/06				
Sampling Dates:		6/16-9/06				
Female	Sample Size	1	250	103	4	358
	Percent of Sample	0.1	33.9	14.0	0.5	48.6
	Mean Length ^a	575.0	565.1	579.3	608.0	
	Standard Error	0.0	1.5	2.5	18.3	
Male	Sample Size	0	269	111	0	380
	Percent of Sample	0.0	36.4	15.0	0.0	51.4
	Mean Length		576.8	591.7		
	Standard Error		1.6	2.8		
Total	Sample Size	1	519	214	4	738
	Percent of Sample	0.1	70.3	29.0	0.5	100.0
	Standard Error	0.1	1.7	1.7	0.3	
	Mean Length	575.0	571.1	585.7	608.0	
	Standard Error	0.0	1.1	1.9	18.3	

^a Length was from mid-eye to fork-of-tail.

Table 10. Norton Sound Subdistrict 6 coho salmon commercial catch age and sex composition, and mean length, 1991.

		Brood Year and Age Group			
		1988	1987	1986	Total
		1.1	2.1	3.1	
Stratum Dates:	7/15-9/07				
Sampling Dates:	8/06-8/16				
Sample Size:	143				
Female	Percent of Sample	2.1	42.7	4.9	49.7
	Number in Catch	1,092	22,196	2,547	25,835
	Mean Length ^a	587.7	569.4	574.1	
	Std. Error	17.5	3.1	10.3	
Male	Percent of Sample	2.8	46.9	0.7	50.3
	Number in Catch	1,455	24,379	364	26,198
	Mean Length	591.0	574.9	557.0	
	Std. Error	8.7	4.9	0.0	
Total	Percent of Sample	4.9	89.5	5.6	100.0
	Number in Catch	2,547	46,575	2,911	52,033
	Standard Error	942	1,338	1,003	
	Mean Length	590	572	572	
	Std. Error	8	3	9	

^a Length was from mid-eye to fork-of-tail.

Table 11. Unalakleet River coho salmon test fish catch age and sex composition, and mean length, 1991.

		Brood Year and Age Group			
		1988	1987	1986	
		1.1	2.1	3.1	Total
Stratum Dates:		7/23-9/12			
Sampling Dates:		7/23-9/12			
Female	Sample Size	12	69	4	85
	Percent of Sample	7.2	41.4	2.4	51.0
	Mean Length ^a	588.8	582.8	582.5	
	Std. Error	9.1	3.9	17.1	
Male	Sample Size	25	53	4	82
	Percent of Sample	15.0	31.6	2.4	49.0
	Mean Length	608.5	584.9	588.5	
	Std. Error	5.0	4.5	14.0	
Total	Sample Size	37	122	8	167
	Percent of Sample	22.2	73.0	4.8	100.0
	Standard Error	3.2	3.4	1.7	
	Mean Length	602.1	583.7	585.5	
	Std. Error	4.7	3.0	10.3	

^a Length is from mid-eye to fork-of-tail.

Table 12. Kotzebue District commercial catch, weight, and average weight of chum salmon, chinook salmon, and Dolly Varden by period, 1991.

Period Dates	Hours	Number of Fishermen	Chum Catch			Chinook Catch			+Dolly Varden Catch			
			Number	Pounds	Avg. Wt.	Number	Pounds	Avg. Wt.	Number	Pounds	Avg. Wt.	
1	7/11-7/12	24	26	1,330	11,335	8.5						
2	7/15-7/16	24	62	4,139	35,760	8.6						
3	7/18-7/19	24	62	3,602	28,949	8.0						
4	7/22-7/23	24	87	14,505	122,073	8.4	4	72	18.0			
5	7/25-7/27	36	102	24,624	201,272	8.2	1	35	35.0	29	163	5.6
6	7/29-7/31	36	101	21,631	175,875	8.1	1	23	23.0	2	13	6.5
7	8/01-8/03	36	105	23,371	194,912	8.3	2	23	11.5			
8	8/05-8/07	36	102	26,273	214,490	8.2	2	37	18.5	4	32	8.0
9	8/08-8/10	36	68	7,109	56,060	7.9	2	27	13.5	9	72	8.0
10	8/12-8/13	24	104	37,313	304,700	8.2				370	2,352	6.4
11	8/15-8/17	48	115	35,994	289,993	8.1	10	167	16.7	2,753	17,939	6.5
12	8/19-8/21	48	102	21,845	175,833	8.0	10	147	14.7	2,451	16,534	6.7
13	8/22-8/24	48	69	7,161	55,365	7.7	4	69	17.3	363	2,576	7.1
14	8/26-8/28	48	46	7,083	53,957	7.6	6	96	16.0	141	962	6.8
15	8/29-8/31	48	32	3,943	30,467	7.7	2	18	9.0	14	104	7.4
Totals	540	142	239,923	1,951,041	8.1	44	714	16.2	6,136	40,747	6.6	

Table 13. Kotzebue Area villages of Noatak, Noorvik, and Shungnak subsistence harvest of chum salmon, Dolly Varden and whitefish, 1991.

Village	Number of Households Interviewed	Total Household Members	Average Members per Household	Number Taken		
				Chum	Dolly Varden	White-fish
Noatak	26	162	6	3,777	4,520	3,300
Noorvik	22	169	8	6,855	240	4,470
Shungnak	15	100	7	4,248	54	8,325
Total ^a	63	431	7	14,880	4,814	16,095

^a Totals were not expanded for households not interviewed.

Table 14. Kotzebue District chum salmon aerial survey escapement estimates for primary index streams, 1980-1991. Indices listed in this table are the target survey observed for each tributary during the given year.

Stream	Aerial Escapement Goal	1980	1981 ^a	1982 ^a	1983	1984 ^a	1985 ^a	1986 ^a	1987 ^a	1988 ^a	1989 ^b	1990 ^a	1991
Kobuk Drainage	32,500	34,623	24,325	25,557	44,135	18,697	14,061	17,225	14,457	26,073		29,045	35,840
Squirrel R.	11,500	13,536	9,854	7,690	6,075	5,473	6,145	4,982	2,708	4,848		5,500	4,606
Salmon R.	7,000	8,456	4,709	1,871	1,677	1,471	2,816	1,971	3,333	6,208		6,335	5,845
Tutuksuk R.	2,000	1,165	1,114	1,322	2,637	1,132	5,100	4,257	206	3,122		2,275	744
Upper Kobuk	12,000	11,466	8,648	14,674	33,746	10,621		6,015	8,210	11,895		14,935	24,645
Noatak Drainage	84,000	177,566	120,283	32,286	12,137	5,027	43,526	41,585	9,295	56,029		26,670	84,104
Noatak R.	80,000	159,873	106,513	20,682			43,526	37,277	5,565	45,930		23,345	80,550
Eli R.	4,000	10,277				5,027		4,308	2,780	8,639		3,000	2,900
Kelly R. & Lake		7,416	13,770	11,604	12,137				950	1,460		325	654
Inmachhuk R.					9,131	12,737							

^a Poor or incomplete survey.

^b No survey due to poor weather conditions.

Table 15. Kotzebue District chum salmon commercial catch age and sex composition, and mean length, 1991.

		Brood Year and Age Group				
		1988	1987	1986	1985	Total
		0.2	0.3	0.4	0.5	
Stratum Dates:	7/11-8/31					
Sampling Dates:	7/12-8/31					
Sample Size:	3,292					
Female	Percent of Sample	1.3	33.9	18.1	0.4	53.6
	Number in Catch	3,068	81,216	43,383	949	128,616
	Mean Length ^a	555.8	579.0	602.0	622.7	
	Std. Error	4.1	0.8	1.2	8.1	
Male	Percent of Sample	1.6	26.5	17.7	0.5	46.4
	Number in Catch	3,798	63,687	42,580	1,242	111,307
	Mean Length	564.9	597.9	622.5	624.1	
	Std. Error	5.0	1.1	1.4	10.2	
Total	Percent of Sample	2.9	60.4	35.8	0.9	100.0
	Number in Catch	6,865	144,903	85,963	2,191	239,923
	Standard Error	697	2,045	2,005	398	
	Mean Length	571.1	587.8	612.2	623.5	
	Std. Error	10.8	0.9	1.0	6.7	

^a Length was from mid-eye to fork-of-tail.

Table 16. Noatak River chum salmon drift test net catch age and sex composition, and mean length (mm), 1991.

		Brood Year and Age Group				
		1988	1987	1986	1985	Total
		0.2	0.3	0.4	0.5	
Stratum Dates:	7/23-8/29					
Sampling Dates:	7/23-8/29					
Female	Sample Size	2	149	63	2	216
	Percent of Sample	0.5	35.6	15.0	0.5	51.6
	Mean Length ^a	548.5	584.2	609.7	656.5	
	Std. Error	18.5	2.1	3.3	6.5	
Male	Sample Size	6	117	76	1	200
	Percent of Sample	1.4	27.9	18.1	0.2	47.7
	Mean Length	564.2	609.8	632.8	650.0	
	Std. Error	9.2	2.9	4.1	0.0	
Total	Sample Size	8	269	139	3	419
	Percent of Sample	1.9	64.2	33.2	0.7	100.0
	Standard Error	0.7	2.3	2.3	0.4	
	Mean Length	560.3	595.4	622.3	654.3	
	Std. Error	8.0	1.9	2.9	4.3	

^a Length is from mid-eye to fork-of-tail.

Table 17. Kotzebue District chum salmon tributary escapement age and sex composition, 1991, based on peak aerial survey counts.

Tributary		Brood Year and Age Group			Total
		1987	1986	1985	
		0.3	0.4	0.5	
Noatak River ^a					
	Sampling Date:	9/16			
	Sample Size:	250			
Female	Percent of Sample	4.0	46.0	10.9	60.9
	No. in Escapement	3,248	37,027	8,770	49,045
Male	Percent of Sample	1.6	29.0	8.5	39.1
	No. in Escapement	1,299	23,385	6,821	31,505
Total	Percent of Sample	5.6	75.0	19.4	100.0
	No. in Escapement	4,547	60,413	15,590	80,550
	Standard Error	1,178	2,210	2,017	
Salmon River ^b					
	Sampling Dates:	9/03-9/04			
	Sample Size:	224			
Female	Percent of Sample	3.6	46.0	11.2	60.7
	No. in Escapement	209	2,688	652	3,549
Male	Percent of Sample	3.6	24.6	11.2	39.3
	No. in Escapement	209	1,435	652	2,296
Total	Percent of Sample	7.1	70.5	22.3	100.0
	No. in Escapement	418	4,123	1,305	5,845
	Standard Error	101	178	163	
Squirrel River ^b					
	Sampling Dates:	9/09-9/10			
	Sample Size:	215			
Female	Percent of Sample	1.9	42.8	14.0	58.6
	No. in Escapement	86	1,971	643	2,699
Male	Percent of Sample	1.4	29.8	10.2	41.4
	No. in Escapement	64	1,371	471	1,907
Total	Percent of Sample	3.3	72.6	24.2	100.0
	No. in Escapement	150	3,342	1,114	4,606
	Standard Error	56	140	135	

^a Escapements are based on peak aerial survey counts.

^b Age and sex composition data based on beach seine and carcass samples.

^c Age and sex composition data based on carcass samples.

Table 18. Kotzebue District chum salmon tributary escapement mean length (mm), age and sex, 1991.

Tributary	Brood Year and Age Group		
	1987	1986	1985
	0.3	0.4	0.5
Noatak River ^a			
Females	Mean Length ^b	535.0	550.284
	Std. Error	14.7	7.2
	Sample Size	10	27
Males	Mean Length	582.5	636.7
	Std. Error	9.2	7.7
	Sample Size	4	21
All Fish	Mean Length	548.6	611.8
	Std. Error	12.2	6.1
	Sample Size	14	48
Salmon River ^c			
Females	Mean Length	517.9	560.2
	Std. Error	12.4	5.9
	Sample Size	7	25
Males	Mean Length	535.7	604.6
	Std. Error	11.0	7.8
	Sample Size	7	23
All Fish	Mean Length	526.8	581.5
	Std. Error	8.4	5.8
	Sample Size	14	48
Squirrel River ^c			
Females	Mean Length	535.0	565.0
	Std. Error	32.5	7.3
	Sample Size	3	28
Males	Mean Length	538.3	588.9
	Std. Error	21.3	31.3
	Sample Size	3	19
All Fish	Mean Length	536.7	574.7
	Std. Error	17.4	13.3
	Sample Size	6	47

^a Age and sex composition collected from beach seine and carcass samples.

^b Length was from mid-eye to fork of tail.

^c Age and sex composition collected from carcass samples.

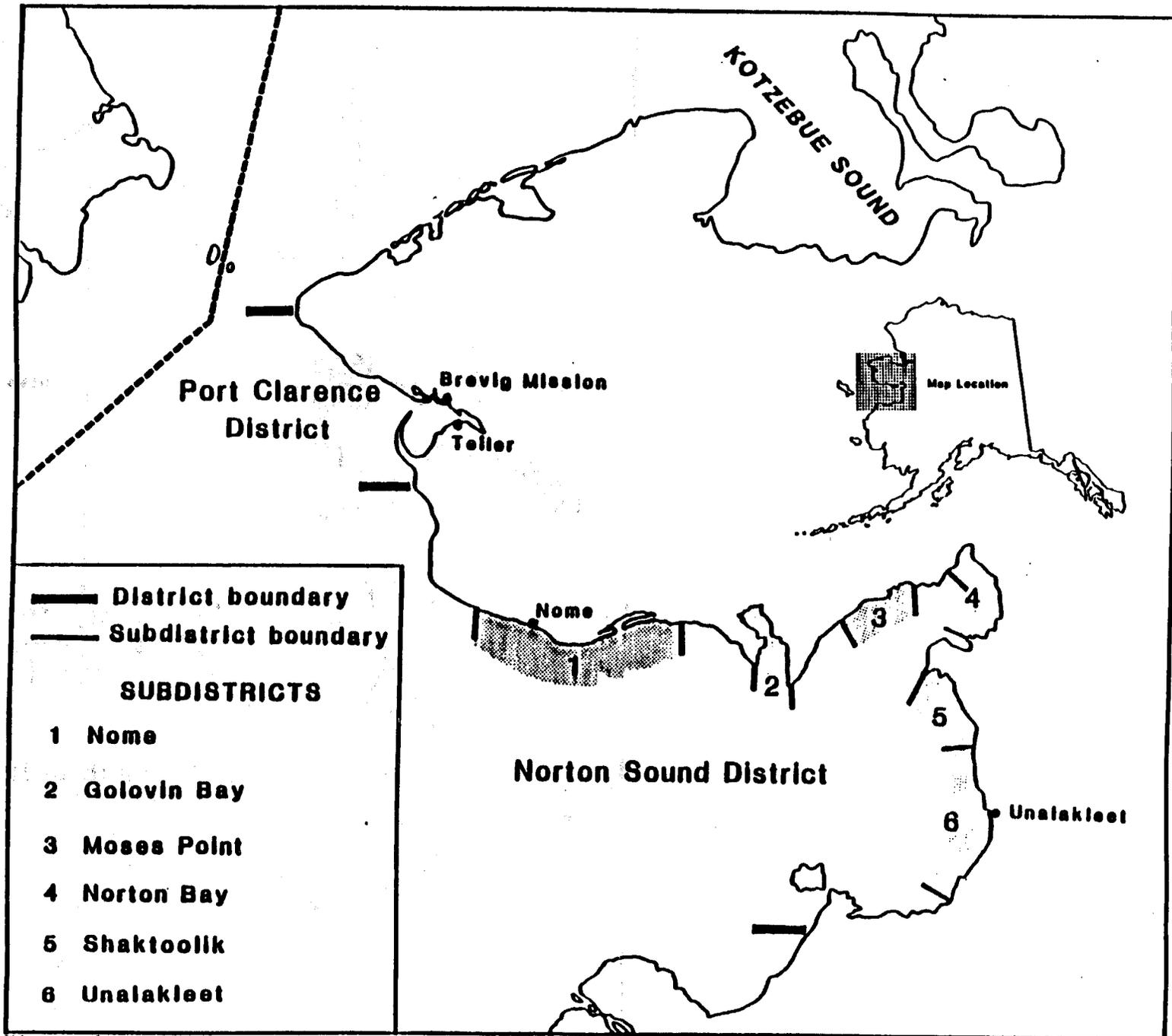


Figure 1. Norton Sound commercial salmon fishing subdistricts.

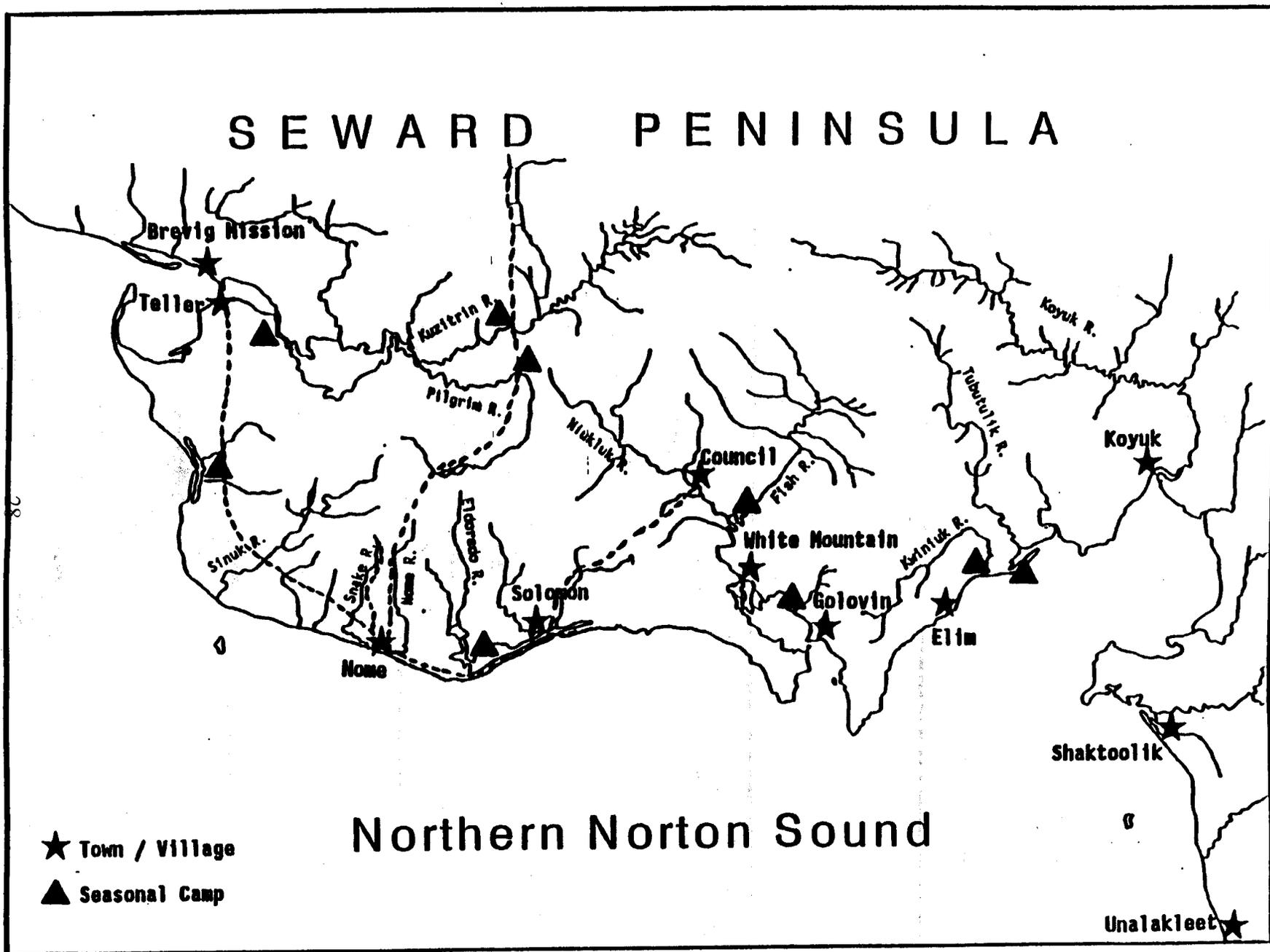


Figure 2. Northern Norton Sound subsistence fishing sites.

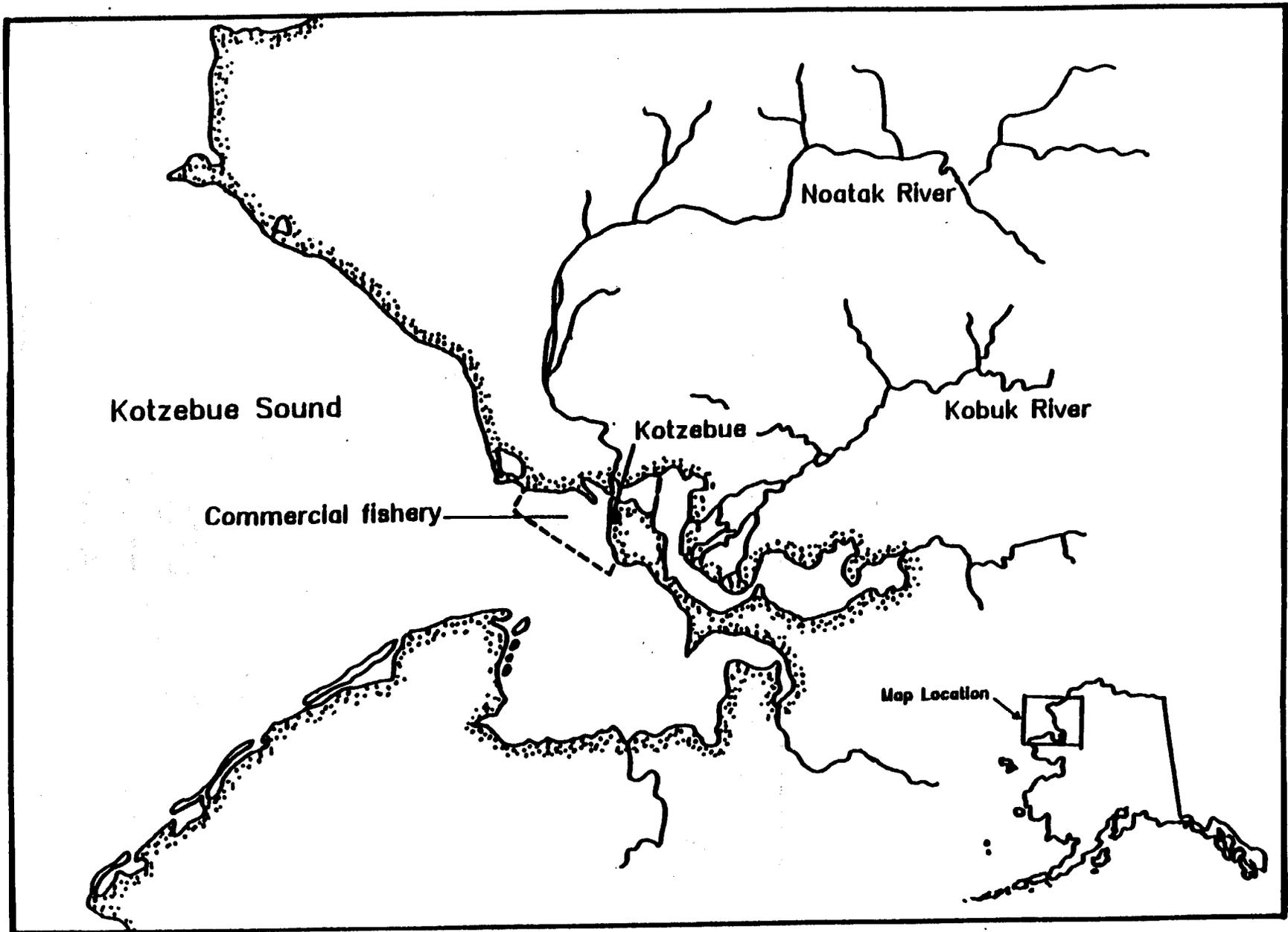


Figure 3. Kotzebue Sound commercial fishing district and major chum salmon spawning streams.

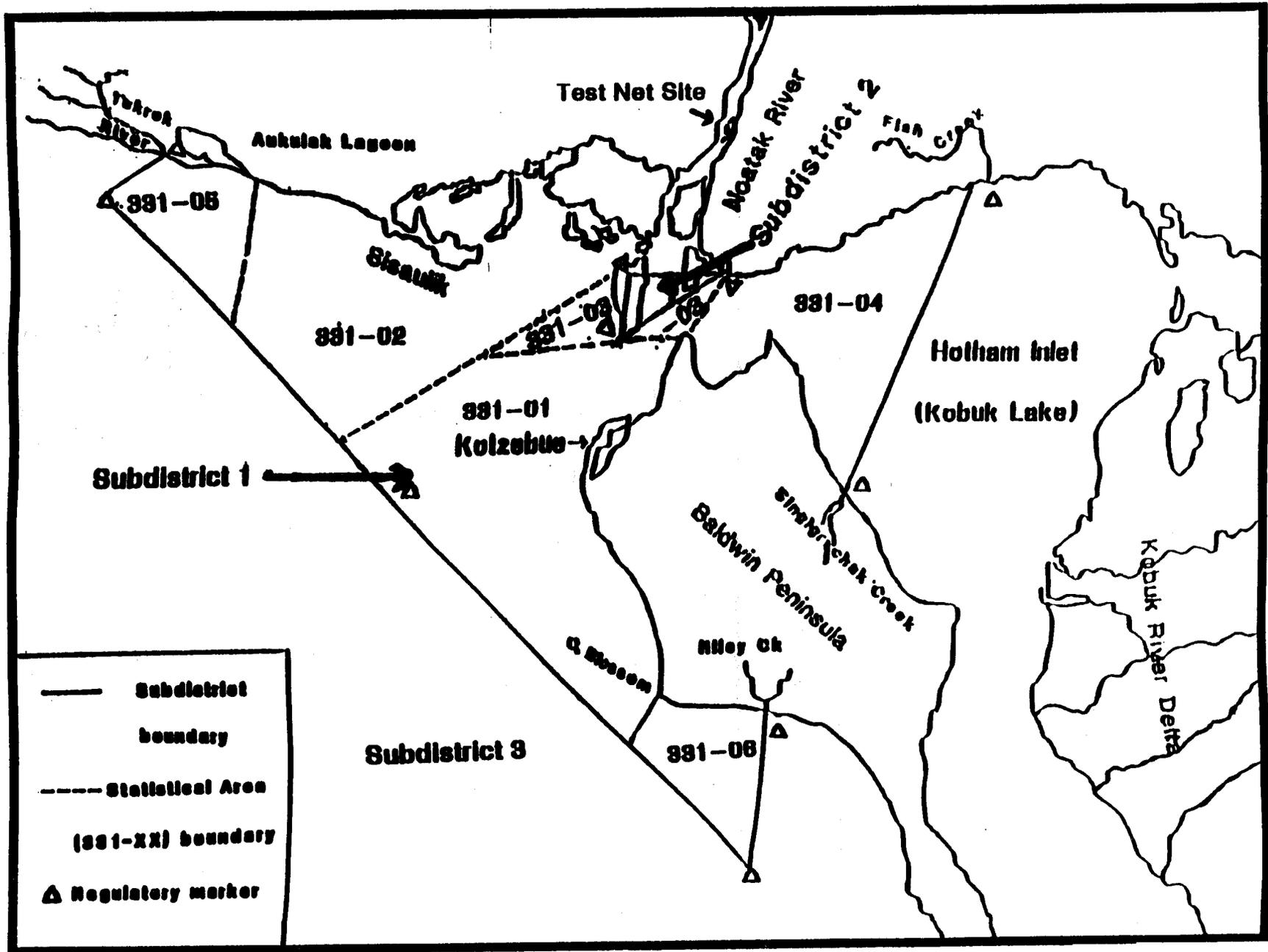


Figure 4. Noatak River and Kotzebue Sound commercial salmon fishing subdistricts and statistical areas.

APPENDIX

Appendix Table A.1. Norton Sound Subdistrict 2 commercial salmon catch and effort by period, 1991.

Period Number	Period Dates	Hours Fished	Number of Fishermen	Number of Salmon			
				Chinook	Sockeye	Chum	Coho
1	6/20-6/22	48	3	7	1	586	
2	6/24-6/26	48	10	8	0	2,557	
3	6/27-6/29	48	11	21	0	2,927	
4	7/01-7/03	48	14	11	0	4,920	
5	7/04-7/06	48	13	2	0	3,849	
6	7/08-7/10	48	No Buyer				
7	7/11-7/13	48	No Buyer				
8	7/15-7/17	48	No Buyer				
9	7/18-7/20	48	No Buyer				
10	7/22-7/24	48	No Buyer				
11	7/25-7/27	48	No Buyer				
12	7/29-7/31	48	No Buyer				
13	8/01-8/03	48	No Buyer				
14	8/05-8/07	48	No Buyer				
15	8/08-8/10	48	No Buyer				
16	8/12-8/14	48	No Buyer				
17	8/15-8/17	48	No Buyer				
18	8/19-8/21	48	No Buyer				
19	8/22-8/24	48	No Buyer				
20	8/26-8/28	48	No Buyer				
21	8/29-8/31	24	No Buyer				
Season Total		240 ^a	16	49	1	14,839	

^a Total time actually fished.

Appendix Table A.2. Norton Sound Subdistrict 3 commercial salmon catch and effort by period, 1991.

Period Number	Period Dates	Hours Fished	Number of Fishermen	Number of Salmon			
				Chinook	Sockeye	Chum	Coho
1	6/24-6/27	24	24	161		804	
2	6/27-6/28	0	Closed by E.O.				
3	7/01-7/02	0	Closed by E.O.				
4	7/04-7/05	0	Closed by E.O.				
5	7/08-7/09	0	Closed by E.O.				
6	7/11-7/12	0	Closed by E.O.				
7	7/15-7/16	0	Closed by E.O.				
8	7/18-7/19	0	Closed by E.O.				
9	7/22-7/23	0	Closed by E.O.				
10	7/25-7/26	0	Closed by E.O.				
11	7/29-7/30	0	Closed by E.O.				
12	8/01-8/03	48	No Buyer				
13	8/05-8/07	48	No Buyer				
14	8/08-8/10	48	No Buyer				
15	8/12-8/14	48	No Buyer				
16	8/15-8/17	48	No Buyer				
17	8/19-8/21	48	No Buyer				
18	8/22-8/24	48	No Buyer				
19	8/26-8/28	48	No Buyer				
20	8/29-8/31	48	No Buyer				
Season Total		24 ^a	24	161		804	

^a Total time actually fished.

Appendix Table A.3. Norton Sound Subdistrict 5 commercial salmon catch and effort by period, 1991.

Period Number	Period Dates	Hours Fished	Number of Fishermen	Number of Salmon			
				Chinook	Sockeye	Chum	Coho
1	6/17-6/18	24	19	259		73	
2	6/20-6/21	24	19	373		114	
3	6/24-6/26	48	20	285	7	1,743	
4	6/27-6/29	48	21	205	8	5,806	
5	7/01-7/03	48	18	91	0	2,796	
6	7/04-7/06	48	16	46	2	4,301	
7	7/08-7/10	48	16	24	8	5,690	
8	7/11-7/13	48	19	18	7	4,169	1
9	7/15-7/17	48	15	8	1	1,299	2
10	7/18-7/20	0	Closed by E.O.				
11	7/22-7/24	0	Closed by E.O.				
12	7/25-7/27	48	15	1	4	1,405	311
13	7/29-7/31	48	12	0	5	846	1,173
14	8/01-8/03	48	15	3	1	791	1,518
15	8/05-8/07	48	18	1	5	1,072	2,392
16	8/08-8/10	48	17	1	1	850	2,967
17	8/12-8/14	48	17	1	2	237	1,001
18	8/15-8/17	48	12	0	2	251	1,381
19	8/19-8/21	48	9	8	2	176	868
20	8/22-8/24	48	No Buyer				
21	8/26-8/28	48	No Buyer				
22	8/29-8/31	48	No Buyer				
23	9/02-9/04	48	No Buyer				
24	9/05-9/07	48	No Buyer				
Season Total		672 ^a	25	1,324	55	31,619	11,614

^a Total time actually fished.

Appendix Table A.4. Norton Sound Subdistrict 6 commercial salmon catch and effort by period, 1991.

Period Number	Period Dates	Hours Fished	Number of Fishermen	Number of Salmon			
				Chinook	Sockeye	Chum	Coho
1	6/17-6/18	24	46	1,098		135	
2	6/20-6/21	24	47	582		82	
3	6/24-6/26	48	52	979	2	605	
4	6/27-6/29	48	56	1,074	2	2,569	
5	7/01-7/03	48	51	551	1	2,299	
6	7/04-7/06	48	29	101	0	2,655	
7	7/08-7/10	48	33	43	4	3,118	
8	7/11-7/13	48	31	34	22	4,892	
9	7/15-7/17	48	34	15	19	6,172	13
10	7/18-7/20	0	Closed by E.O.				
11	7/22-7/24	0	Closed by E.O.				
12	7/25-7/27	48	36	5	8	4,438	1,606
13	7/29-7/31	48	43	10	13	2,769	3,061
14	8/01-8/03	48	43	0	6	2,358	4,416
15	8/05-8/07	48	45	7	6	2,217	9,000
16	8/08-8/10	48	45	2	6	1,916	9,161
17	8/12-8/14	48	51	4	8	945	6,533
18	8/15-8/17	48	47	1	6	879	5,164
19	8/19-8/21	48	46	10	8	976	6,634
20	8/22-8/24	48	32	3	3	286	1,939
21	8/26-8/28	48	33	12	15	202	3,069
22	8/29-8/31	48	29	3	11	92	1,180
23	9/02-9/04	48	2	0	7	4	109
24	9/05-9/07	48	2	0	0	0	148
Season Total		672 ^a	75	4,534	147	39,609	52,033

^a Total time actually fished.

Appendix Table B.1. Norton Sound Subdistrict 6 chum salmon commercial catch age and sex composition by time period, 1991.

		Brood Year and Age Group			Total
		1987	1986	1985	
		0.3	0.4	0.5	
Stratum Dates: 6/17-6/29		Periods 1-4 ^a			
Sampling Dates: 6/28					
Sample Size: 25					
Female	Percent of Sample	12.0	24.0	0.0	36.0
	Number in Catch	407	814	0	1,221
Male	Percent of Sample	28.0	36.0	0.0	64.0
	Number in Catch	949	1,221	0	2,170
Total	Percent of Sample	40.0	60.0	0.0	100.0
	Number in Catch	1,356	2,035	0	3,391
	Standard Error	339	339	0	
Stratum Dates: 7/01-7/06		Periods 5 & 6			
Sampling Dates: 7/03-7/05					
Sample Size: 99					
Female	Percent of Sample	27.3	18.2	0.0	45.5
	Number in Catch	1,351	901	0	2,252
Male	Percent of Sample	30.3	22.2	2.0	54.5
	Number in Catch	1,501	1,101	100	2,702
Total	Percent of Sample	57.6	40.4	2.0	100.0
	Number in Catch	2,852	2,002	100	4,954
	Standard Error	247	246	70	
Stratum Dates: 7/08-7/13		Periods 7 & 8			
Sampling Dates: 7/09-7/12					
Sample Size: 100					
Female	Percent of Sample	22.0	26.0	0.0	48.0
	Number in Catch	1,762	2,083	0	3,845
Male	Percent of Sample	31.0	21.0	0.0	52.0
	Number in Catch	2,483	1,682	0	4,165
Total	Percent of Sample	53.0	47.0	0.0	100.0
	Number in Catch	4,245	3,765	0	8,010
	Standard Error	402	402	0	

(continued)

Appendix Table B.1. (Page 2 of 3)

		Brood Year and Age Group			
		1987	1986	1985	
		0.3	0.4	0.5	Total
Stratum Dates: 7/15-7/20		Period 9 ^b			
Sampling Dates: 7/16					
Sample Size: 50					
Female	Percent of Sample	40.0	16.0	0.0	56.0
	Number in Catch	2,469	988	0	3,456
Male	Percent of Sample	30.0	14.0	0.0	44.0
	Number in Catch	1,852	864	0	2,716
Total	Percent of Sample	70.0	30.0	0.0	100.0
	Number in Catch	4,320	1,852	0	6,172
	Standard Error	404	404	0	
Stratum Dates: 7/22-7/27		Period 12 ^b			
Sampling Dates: 7/26					
Sample Size: 75					
Female	Percent of Sample	48.0	4.0	0.0	52.0
	Number in Catch	2,130	178	0	2,308
Male	Percent of Sample	38.7	9.3	0.0	48.0
	Number in Catch	1,716	414	0	2,130
Total	Percent of Sample	86.7	13.3	0.0	100.0
	Number in Catch	3,846	592	0	4,438
	Standard Error	175	175	0	
Stratum Dates: 7/29-9/07		Period 13-23 ^a			
Sampling Dates: 7/30-8/02					
Sample Size: 114					
Female	Percent of Sample	34.2	11.4	0.0	45.6
	Number in Catch	4,326	1,442	0	5,767
Male	Percent of Sample	42.1	12.3	0.0	54.4
	Number in Catch	5,324	1,553	0	6,877
Total	Percent of Sample	76.3	23.7	0.0	100.0
	Number in Catch	9,649	2,995	0	12,644
	Standard Error	506	506	0	

(continued)

Appendix Table B.1. (Page 3 of 3)

		Brood Year and Age Group			
		1987	1986	1985	
		0.3	0.4	0.5	Total
Stratum Dates:	6/17-9/07	Season Total			
Sampling Dates:	6/28-8/02				
Sample Size:	463				
Female	Percent of Sample	31.7	16.0	0.0	47.7
	Number in Catch	12,576	6,331	0	18,906
Male	Percent of Sample	34.6	17.3	0.4	52.3
	Number in Catch	13,688	6,844	171	20,703
Total	Percent of Sample	66.3	33.3	0.4	100.0
	Number in Catch	26,263	13,174	171	39,609
	Standard Error	871	868	121	

^a Periods were pooled due to a lack of samples.

^b Periods 10 and 11 were closed by Emergency Order.

Appendix Table B.2. Unalakleet River chum salmon test gillnet age and sex composition by time period, 1991.

		Brood Year and Age Group				
		1988	1987	1986	1985	Total
		0.2	0.3	0.4	0.5	
Stratum Dates: 6/11-6/16						
Sampling Dates: 6/11-6/16						
Female	Sample Size	0	2	4	1	7
	Percent of Sample	0.0	13.3	26.7	6.7	46.7
Male	Sample Size	0	3	5	0	8
	Percent of Sample	0.0	20.0	33.3	0.0	53.3
Total	Sample Size	0	5	9	1	15
	Percent of Sample	0.0	33.3	60.0	6.7	100.0
	Standard Error	0.0	12.6	13.1	6.7	
Stratum Dates: 6/17-6/23						
Sampling Dates: 6/17-6/23						
Female	Sample Size	0	3	9	0	12
	Percent of Sample	0.0	12.5	37.5	0.0	50.0
Male	Sample Size	0	5	7	0	12
	Percent of Sample	0.0	20.8	29.2	0.0	50.0
Total	Sample Size	0	8	16	0	24
	Percent of Sample	0.0	33.3	66.7	0.0	100.0
	Standard Error	0.0	9.8	9.8	0.0	
Stratum Dates: 6/24-6/30						
Sampling Dates: 6/24-6/30						
Female	Sample Size	0	1	3	0	4
	Percent of Sample	0.0	6.3	18.8	0.0	25.0
Male	Sample Size	0	4	8	0	12
	Percent of Sample	0.0	25.0	50.0	0.0	75.0
Total	Sample Size	0	5	11	0	16
	Percent of Sample	0.0	31.3	68.8	0.0	100.0
	Standard Error	0.0	12.0	12.0	0.0	

(continued)

Appendix Table B.2. (Page 2 of 5)

		Brood Year and Age Group				
		1988	1987	1986	1985	Total
		0.2	0.3	0.4	0.5	
Stratum Dates:		7/01-7/06				
Sampling Dates:		7/01-7/06				
Female	Sample Size	0	7	8	0	15
	Percent of Sample	0.0	20.0	22.9	0.0	42.9
Male	Sample Size	0	12	8	0	20
	Percent of Sample	0.0	34.3	22.9	0.0	57.1
Total	Sample Size	0	19	16	0	35
	Percent of Sample	0.0	54.3	45.7	0.0	100.0
	Standard Error	0.0	8.5	8.5	0.0	
Stratum Dates:		7/08-7/13				
Sampling Dates:		7/08-7/13				
Female	Sample Size	0	12	5	1	18
	Percent of Sample	0.0	30.0	12.5	2.5	45.0
Male	Sample Size	0	12	10	0	22
	Percent of Sample	0.0	30.0	25.0	0.0	55.0
Total	Sample Size	0	24	15	1	40
	Percent of Sample	0.0	60.0	37.5	2.5	100.0
	Standard Error	0.0	7.8	7.8	2.5	
Stratum Dates:		7/15-7/20				
Sampling Dates:		7/15-7/20				
Female	Sample Size	0	42	29	1	72
	Percent of Sample	0.0	33.1	22.8	0.8	56.7
Male	Sample Size	0	34	21	0	55
	Percent of Sample	0.0	26.8	16.5	0.0	43.3
Total	Sample Size	0	76	50	1	127
	Percent of Sample	0.0	59.8	39.4	0.8	100.0
	Standard Error	0.0	4.4	4.4	0.8	

(continued)

Appendix Table B.2. (Page 3 of 5)

		Brood Year and Age Group				
		1988	1987	1986	1985	Total
		0.2	0.3	0.4	0.5	
Stratum Dates:		7/22-7/27				
Sampling Dates:		7/22-7/27				
Female	Sample Size	0	45	16	1	62
	Percent of Sample	0.0	35.4	12.6	0.8	48.8
Male	Sample Size	0	43	22	0	65
	Percent of Sample	0.0	33.9	17.3	0.0	51.2
Total	Sample Size	0	88	38	1	127
	Percent of Sample	0.0	69.3	29.9	0.8	100.0
	Standard Error	0.0	4.1	4.1	0.8	
Stratum Dates:		7/29-8/03				
Sampling Dates:		7/29-8/03				
Female	Sample Size	1	45	17	0	63
	Percent of Sample	0.7	32.4	12.2	0.0	45.3
Male	Sample Size	0	62	14	0	76
	Percent of Sample	0.0	44.6	10.1	0.0	54.7
Total	Sample Size	1	107	31	0	139
	Percent of Sample	0.7	77.0	22.3	0.0	100.0
	Standard Error	0.7	3.6	3.5	0.0	
Stratum Dates:		8/05-8/10				
Sampling Dates:		8/05-8/10				
Female	Sample Size	0	49	10	0	59
	Percent of Sample	0.0	38.9	7.9	0.0	46.8
Male	Sample Size	0	58	9	0	67
	Percent of Sample	0.0	46.0	7.1	0.0	53.2
Total	Sample Size	0	107	19	0	126
	Percent of Sample	0.0	84.9	15.1	0.0	100.0
	Standard Error	0.0	3.2	3.2	0.0	

(continued)

Appendix Table B.2. (Page 4 of 5)

		Brood Year and Age Group				
		1988	1987	1986	1985	Total
		0.2	0.3	0.4	0.5	
Stratum Dates:		8/12-8/17				
Sampling Dates:		8/12-8/17				
Female	Sample Size	0	15	0	0	15
	Percent of Sample	0.0	48.4	0.0	0.0	48.4
Male	Sample Size	0	14	2	0	16
	Percent of Sample	0.0	45.2	6.5	0.0	51.6
Total	Sample Size	0	29	2	0	31
	Percent of Sample	0.0	93.5	6.5	0.0	100.0
	Standard Error	0.0	4.5	4.5	0.0	
Stratum Dates:		8/19-8/24				
Sampling Dates:		8/19-8/24				
Female	Sample Size	0	22	0	0	22
	Percent of Sample	0.0	59.5	0.0	0.0	59.5
Male	Sample Size	0	14	1	0	15
	Percent of Sample	0.0	37.8	2.7	0.0	40.5
Total	Sample Size	0	36	1	0	37
	Percent of Sample	0.0	97.3	2.7	0.0	100.0
	Standard Error	0.0	2.7	2.7	0.0	
Stratum Dates:		8/26-8/30				
Sampling Dates:		8/26-8/30				
Female	Sample Size	0	4	0	0	4
	Percent of Sample	0.0	40.0	0.0	0.0	40.0
Male	Sample Size	0	4	2	0	6
	Percent of Sample	0.0	40.0	20.0	0.0	60.0
Total	Sample Size	0	8	2	0	10
	Percent of Sample	0.0	80.0	20.0	0.0	100.0
	Standard Error	0.0	13.3	13.3	0.0	

(continued)

Appendix Table B.2. (Page 5 of 5)

		Brood Year and Age Group				
		1988	1987	1986	1985	Total
		0.2	0.3	0.4	0.5	
Stratum Dates:		9/02-9/06				
Sampling Dates:		9/02-9/06				
Female	Sample Size	0	4	2	0	6
	Percent of Sample	0.0	36.4	18.2	0.0	54.5
Male	Sample Size	0	3	2	0	5
	Percent of Sample	0.0	27.3	18.2	0.0	45.5
Total	Sample Size	0	7	4	0	11
	Percent of Sample	0.0	63.6	36.4	0.0	100.0
	Standard Error	0.0	15.2	15.2	0.0	
Stratum Dates:		6/16-9/06				
Sampling Dates:		6/16-9/06				
		Season Total				
Female	Sample Size	1	250	103	4	358
	Percent of Sample	0.1	33.9	14.0	0.5	48.6
Male	Sample Size	0	269	111	0	380
	Percent of Sample	0.0	36.4	15.0	0.0	51.4
Total	Sample Size	1	519	214	4	738
	Percent of Sample	0.1	70.3	29.0	0.5	100.0
	Standard Error	0.1	1.7	1.7	0.3	

Appendix Table C.1. Kwiniuk River tower expanded daily and cumulative counts of pink, chum, and chinook salmon, 1991.

Date	Pink Salmon		Chum Salmon		Chinook Salmon	
	Daily	Cum.	Daily	Cum.	Daily	Cum.
18-Jun						
19-Jun					2	2
20-Jun					4	6
21-Jun					0	6
22-Jun	6	6	12	12	6	12
23-Jun	10	16	24	36	2	14
24-Jun	0	16	-14	22	1	15
25-Jun	0	16	41	63	2	17
26-Jun	0	16	176	239	4	21
27-Jun	4	20	96	335	10	31
28-Jun	4	24	566	901	16	47
29-Jun	4	28	409	1,310	55	102
30-Jun	37	65	605	1,915	68	170
01-Jul	70	135	801	2,716	82	252
02-Jul	64	199	906	3,622	75	327
03-Jul	390	589	372	3,994	71	398
04-Jul	-74	515	-44	3,950	0	398
05-Jul	85	600	744	4,694	14	412
06-Jul	216	816	1,139	5,833	32	444
07-Jul	198	1,014	705	6,538	21	465
08-Jul	179	1,193	270	6,808	9	474
09-Jul	1,533	2,726	2,203	9,011	54	528
10-Jul	771	3,497	328	9,339	40	568
11-Jul	714	4,211	406	9,745	36	604
12-Jul	631	4,842	324	10,069	0	604
13-Jul	-2	4,840	492	10,561	4	608
14-Jul	389	5,229	472	11,033	14	622
15-Jul	781	6,010	453	11,486	24	646
16-Jul	2,836	8,846	664	12,150	17	663
17-Jul	1,576	10,422	818	12,968	28	691
18-Jul	1,221	11,643	408	13,376	11	702
19-Jul	1,334	12,977	414	13,790	-4	698
20-Jul	3,342	16,319	640	14,430	2	700
21-Jul	3,859	20,178	930	15,360	0	700
22-Jul	4,375	24,553	1,219	16,579	-2	698
23-Jul	6,049	30,602	1,206	17,785	6	704
24-Jul	8,913	39,515	1,110	18,895	0	704
25-Jul	5,314	44,829	366	19,261	0	704
26-Jul	5,812	50,641	496	19,757	4	708
27-Jul	2,858	53,499	44	19,801	0	708

Appendix Table D.1. Kotzebue District chum salmon commercial catch age and sex composition by fishing period, 1991.

		Brood Year and Age Group				
		1988	1987	1986	1985	Total
		0.2	0.3	0.4	0.5	
Stratum Dates: 7/11-7/12		Period 1				
Sampling Dates: 7/12						
Sample Size: 228						
Female	Percent of Sample	0.0	15.8	31.1	1.3	48.2
	Number in Catch	0	210	414	18	642
Male	Percent of Sample	0.0	13.2	36.0	2.6	51.8
	Number in Catch	0	175	478	35	688
Total	Percent of Sample	0.0	28.9	67.1	3.9	100.0
	Number in Catch	0	385	893	53	1,330
	Standard Error	0	40	41	17	
Stratum Dates: 7/15-7/16		Period 2				
Sampling Dates: 7/16						
Sample Size: 219						
Female	Percent of Sample	0.0	7.8	29.2	0.5	37.4
	Number in Catch	0	321	1,210	19	1,550
Male	Percent of Sample	0.0	20.1	42.0	0.5	62.6
	Number in Catch	0	832	1,739	19	2,589
Total	Percent of Sample	0.0	27.9	71.2	0.9	100.0
	Number in Catch	0	1,153	2,948	38	4,139
	Standard Error	0	126	127	27	
Stratum Dates: 7/18-7/19		Period 3				
Sampling Dates: 7/19						
Sample Size: 216						
Female	Percent of Sample	0.0	14.8	32.4	1.9	49.1
	Number in Catch	0	534	1,167	67	1,768
Male	Percent of Sample	0.5	18.1	31.9	0.5	50.9
	Number in Catch	17	650	1,151	17	1,834
Total	Percent of Sample	0.5	32.9	64.4	2.3	100.0
	Number in Catch	17	1,184	2,318	83	3,602
	Standard Error	17	115	118	37	

(continued)

Appendix Table D.1. (Page 2 of 6)

		Brood Year and Age Group				
		1988	1987	1986	1985	Total
		0.2	0.3	0.4	0.5	
Stratum Dates: 7/22-7/23		Period 4				
Sampling Dates: 7/23						
Sample Size: 222						
Female	Percent of Sample	0.0	18.9	26.6	0.0	45.5
	Number in Catch	0	2,744	3,855	0	6,599
Male	Percent of Sample	0.0	26.6	27.0	0.9	54.5
	Number in Catch	0	3,855	3,920	131	7,906
Total	Percent of Sample	0.0	45.5	53.6	0.9	100.0
	Number in Catch	0	6,599	7,775	131	14,505
	Standard Error	0	486	487	92	
Stratum Dates: 7/25-7/26		Period 5				
Sampling Dates: 7/25-7/26						
Sample Size: 221						
Female	Percent of Sample	0.0	40.3	23.1	0.5	63.8
	Number in Catch	0	9,916	5,682	111	15,710
Male	Percent of Sample	0.5	20.8	14.5	0.5	36.2
	Number in Catch	111	5,125	3,565	111	8,914
Total	Percent of Sample	0.5	61.1	37.6	0.9	100.0
	Number in Catch	111	15,042	9,248	223	24,624
	Standard Error	111	809	804	157	
Stratum Dates: 7/29-7/30		Period 6				
Sampling Dates: 7/29-7/30						
Sample Size: 220						
Female	Percent of Sample	0.5	28.6	20.9	0.5	50.5
	Number in Catch	98	6,194	4,523	98	10,914
Male	Percent of Sample	0.9	32.7	15.5	0.5	49.5
	Number in Catch	197	7,079	3,343	98	10,717
Total	Percent of Sample	1.4	61.4	36.4	0.9	100.0
	Number in Catch	295	13,274	7,866	197	21,631
	Standard Error	170	712	703	139	

(continued)

Appendix Table D.1. (Page 3 of 6)

		Brood Year and Age Group				
		1988	1987	1986	1985	Total
		0.2	0.3	0.4	0.5	
Stratum Dates: 8/01-8/02		Period 7				
Sampling Dates: 8/01-8/02						
Sample Size: 217						
Female	Percent of Sample	0.0	32.3	13.8	0.5	46.5
	Number in Catch	0	7,539	3,231	108	10,878
Male	Percent of Sample	1.8	34.6	16.6	0.5	53.5
	Number in Catch	431	8,078	3,877	108	12,493
Total	Percent of Sample	1.8	66.8	30.4	0.9	100.0
	Number in Catch	431	15,617	7,108	215	23,371
	Standard Error	214	749	732	152	
Stratum Dates: 8/05-8/06		Period 8				
Sampling Dates: 8/05-8/06						
Sample Size: 221						
Female	Percent of Sample	1.4	39.8	7.7	0.0	48.9
	Number in Catch	357	10,462	2,021	0	12,839
Male	Percent of Sample	2.7	39.8	7.7	0.9	51.1
	Number in Catch	713	10,462	2,021	238	13,434
Total	Percent of Sample	4.1	79.6	15.4	0.9	100.0
	Number in Catch	1,070	20,923	4,042	238	26,273
	Standard Error	350	713	639	168	
Stratum Dates: 8/08-8/09		Period 9				
Sampling Dates: 8/08-8/09						
Sample Size: 216						
Female	Percent of Sample	2.3	32.9	18.5	0.0	53.7
	Number in Catch	165	2,337	1,316	0	3,818
Male	Percent of Sample	0.5	29.2	16.7	0.0	46.3
	Number in Catch	33	2,073	1,185	0	3,291
Total	Percent of Sample	2.8	62.0	35.2	0.0	100.0
	Number in Catch	197	4,410	2,501	0	7,109
	Standard Error	80	235	232	0	

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Appendix Table D.1. (Page 4 of 6)

		Brood Year and Age Group				
		1988	1987	1986	1985	Total
		0.2	0.3	0.4	0.5	
Stratum Dates: 8/12-8/13		Period 10				
Sampling Dates: 8/12-8/13						
Sample Size: 220						
Female	Percent of Sample	1.4	37.3	11.4	0.0	50.0
	Number in Catch	509	13,908	4,240	0	18,657
Male	Percent of Sample	2.3	38.2	9.5	0.0	50.0
	Number in Catch	848	14,247	3,562	0	18,657
Total	Percent of Sample	3.6	75.5	20.9	0.0	100.0
	Number in Catch	1,357	28,154	7,802	0	37,313
	Standard Error	472	1,085	1,025	0	
Stratum Dates: 8/15-8/17		Period 11				
Sampling Dates: 8/15-8/17						
Sample Size: 215						
Female	Percent of Sample	2.8	42.3	12.1	0.0	57.2
	Number in Catch	1,004	15,235	4,353	0	20,592
Male	Percent of Sample	4.2	27.0	10.7	0.9	42.8
	Number in Catch	1,507	9,710	3,851	335	15,402
Total	Percent of Sample	7.0	69.3	22.8	0.9	100.0
	Number in Catch	2,511	24,945	8,203	335	35,994
	Standard Error	627	1,135	1,032	236	
Stratum Dates: 8/19-8/21		Period 12				
Sampling Dates: 8/19-8/21						
Sample Size: 220						
Female	Percent of Sample	3.6	45.0	11.4	0.5	60.5
	Number in Catch	794	9,830	2,482	99	13,206
Male	Percent of Sample	1.8	26.8	10.9	0.0	39.5
	Number in Catch	397	5,858	2,383	0	8,639
Total	Percent of Sample	5.5	71.8	22.3	0.5	100.0
	Number in Catch	1,192	15,689	4,865	99	21,845
	Standard Error	335	664	614	99	

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Appendix Table D.1. (Page 5 of 6)

		Brood Year and Age Group				
		1988	1987	1986	1985	Total
		0.2	0.3	0.4	0.5	
Stratum Dates: 8/22-8/24		Period 13				
Sampling Dates: 8/22-8/24						
Sample Size: 219						
Female	Percent of Sample	3.2	54.2	6.9	0.0	64.4
	Number in Catch	229	3,882	497	0	4,608
Male	Percent of Sample	3.7	22.2	9.7	0.0	35.6
	Number in Catch	265	1,591	696	0	2,552
Total	Percent of Sample	6.9	76.4	16.7	0.0	100.0
	Number in Catch	494	5,474	1,193	0	7,161
	Standard Error	403	675	593	0	
Stratum Dates: 8/26-8/28		Period 14				
Sampling Dates: 8/26-8/28						
Sample Size: 222						
Female	Percent of Sample	2.3	49.3	7.7	0.0	59.3
	Number in Catch	163	3,493	547	0	4,203
Male	Percent of Sample	3.2	28.8	8.7	0.0	40.7
	Number in Catch	227	2,038	616	0	2,880
Total	Percent of Sample	5.5	78.1	16.4	0.0	100.0
	Number in Catch	390	5,531	1,162	0	7,083
	Standard Error	404	733	656	0	
Stratum Dates: 8/29-8/31		Period 15				
Sampling Dates: 8/29-8/31						
Sample Size: 218						
Female	Percent of Sample	1.8	50.2	17.5	0.5	70.0
	Number in Catch	72	1,981	690	18	2,762
Male	Percent of Sample	1.8	20.3	7.8	0.0	30.0
	Number in Catch	72	800	309	0	1,181
Total	Percent of Sample	3.6	70.5	25.3	0.5	100.0
	Number in Catch	144	2,782	999	18	3,943
	Standard Error	50	122	116	18	

(continued)

Appendix Table D.1. (Page 6 of 6)

		Brood Year and Age Group				
		1988	1987	1986	1985	Total
		0.2	0.3	0.4	0.5	
Stratum Dates:	7/11-8/31	Season Total				
Sampling Dates:	7/12-8/31					
Sample Size:	3,292					
Female	Percent of Sample	1.3	33.9	18.1	0.4	53.6
	Number in Catch	3,068	81,216	43,383	949	128,616
Male	Percent of Sample	1.6	26.5	17.7	0.5	46.4
	Number in Catch	3,798	63,687	42,580	1,242	111,307
Total	Percent of Sample	2.9	60.4	35.8	0.9	100.0
	Number in Catch	6,865	144,903	85,963	2,191	239,923
	Standard Error	697	2,045	2,005	398	

Appendix Table D.2. Noatak River chum salmon drift test net catch age and sex composition by time period, 1991.

		Brood Year and Age Group				
		1988	1987	1986	1985	Total
		0.2	0.3	0.4	0.5	
Stratum Dates: 7/23-7/27						
Sampling Dates: 7/23-7/27						
Female	Sample Size	0	14	15	1	30
	Percent of Sample	0.0	29.2	31.3	2.1	62.5
Male	Sample Size	0	7	11	0	18
	Percent of Sample	0.0	14.6	22.9	0.0	37.5
Total	Sample Size	0	21	26	1	48
	Percent of Sample	0.0	43.8	54.2	2.1	100.0
	Standard Error	0.0	7.2	7.3	2.1	
Stratum Dates: 7/29-8/03						
Sampling Dates: 7/29-8/03						
Female	Sample Size	1	47	20	0	68
	Percent of Sample	0.7	33.6	14.3	0.0	48.6
Male	Sample Size	3	38	31	0	72
	Percent of Sample	2.1	27.1	22.1	0.0	51.4
Total	Sample Size	4	85	51	0	140
	Percent of Sample	2.9	60.7	36.4	0.0	100.0
	Standard Error	1.4	4.1	4.1	0.0	
Stratum Dates: 8/05-8/10						
Sampling Dates: 8/05-8/10						
Female	Sample Size	0	29	12	0	41
	Percent of Sample	0.0	33.0	13.6	0.0	46.6
Male	Sample Size	0	30	16	1	47
	Percent of Sample	0.0	34.1	18.2	1.1	53.4
Total	Sample Size	0	59	28	1	88
	Percent of Sample	0.0	67.0	31.8	1.1	100.0
	Standard Error	0.0	5.0	5.0	1.1	

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		Brood Year and Age Group				
		1988	1987	1986	1985	Total
		0.2	0.3	0.4	0.5	
Stratum Dates: 8/12-8/17						
Sampling Dates: 8/12-8/17						
Female	Sample Size	1	34	9	1	45
	Percent of Sample	1.1	37.0	9.8	1.1	48.9
Male	Sample Size	0	31	13	0	44
	Percent of Sample	0.0	33.7	14.1	0.0	47.8
Total	Sample Size	1	68	22	1	92
	Percent of Sample	1.1	73.9	23.9	1.1	100.0
	Standard Error	1.1	4.6	4.5	1.1	
Stratum Dates: 8/19-8/24						
Sampling Dates: 8/19-8/24						
Female	Sample Size	0	11	3	0	14
	Percent of Sample	0.0	52.4	14.3	0.0	66.7
Male	Sample Size	1	5	1	0	7
	Percent of Sample	4.8	23.8	4.8	0.0	33.3
Total	Sample Size	1	16	4	0	21
	Percent of Sample	4.8	76.2	19.0	0.0	100.0
	Standard Error	4.8	9.5	8.8	0.0	
Stratum Dates: 8/26-8/30						
Sampling Dates: 8/26-8/30						
Female	Sample Size	0	14	4	0	18
	Percent of Sample	0.0	46.7	13.3	0.0	60.0
Male	Sample Size	2	6	4	0	12
	Percent of Sample	6.7	20.0	13.3	0.0	40.0
Total	Sample Size	2	20	8	0	30
	Percent of Sample	6.7	66.7	26.7	0.0	100.0
	Standard Error	4.6	8.8	8.2	0.0	

(continued)

Appendix Table D.2. (Page 3 of 3)

		Brood Year and Age Group				
		1988	1987	1986	1985	Total
		0.2	0.3	0.4	0.5	
Stratum Dates: 7/23-8/29		Season Total				
Sampling Dates: 7/23-8/29						
Female	Sample Size	2	149	63	2	216
	Percent of Sample	0.5	35.6	15.0	0.5	51.6
Male	Sample Size	6	117	76	1	200
	Percent of Sample	1.4	27.9	18.1	0.2	47.7
Total	Sample Size	8	269	139	3	419
	Percent of Sample	1.9	64.2	33.2	0.7	100.0
	Standard Error	0.7	2.3	2.3	0.4	

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