

Informational Leaflet **122**

COMPILATION OF CATCH AND ESCAPEMENT DATA OF
NUSHAGAK AND TOGIAK DISTRICT KING, CHUM AND
COHO SALMON, BRISTOL BAY, 1967

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INTRODUCTION

This publication is the second in a series intended to annually present catch and escapement statistics for the king, chum, pink and coho salmon fisheries of Bristol Bay. The major run of salmon other than red salmon takes place in the Nushagak and Togiak districts of Bristol Bay (Table 1). This report deals only with these two fishing districts. The limited runs in the other three districts of Bristol Bay precludes efforts to sample in these areas.

Personnel of the Alaska Department of Fish and Game collected all data. The author furnished all scale readings and compiled the data in the form presented.

METHODS AND MATERIALS

All data was collected by field crews stationed at counting towers and at selected canneries in the Nushagak and Togiak districts of Bristol Bay (Figure 1). Each sampling station was supplied with measuring calipers or tapes, weighing scales, appropriate forms and gum cards for scale collection. Scales were taken from each fish sampled and placed on gum cards and pressed to form plastic impressions. Lengths were recorded to the nearest millimeter and weights to the nearest one-tenth of a pound.

Partial aerial escapement counts were obtained in both districts and are presented on Table 2.

Catch sampling was conducted at Pacific Alaska Fisheries, Inc., and

Table 1. Summary of Bristol Bay final commercial catch other than red salmon by district and species, 1967.

District	Catch by Species				Total
	Kings	Chums	Pinks	Cohos	
Naknek-Kvichak	3,705	49,606	20	1,175	54,506
Egegik	2,285	11,039	--	1,044	14,368
Ugashik	1,582	14,104	--	1,901	17,587
Nushagak	96,240	338,286	265	31,517	466,308
Togiak	13,381	63,322	829	18,159	95,691
Total	117,193	476,357	1,114	53,796	648,460
% Composition	18.1	73.4	0.2	8.3	100.0

Table 2. Total estimated run by species other than red salmon, Nushagak and Togiak districts, 1967.

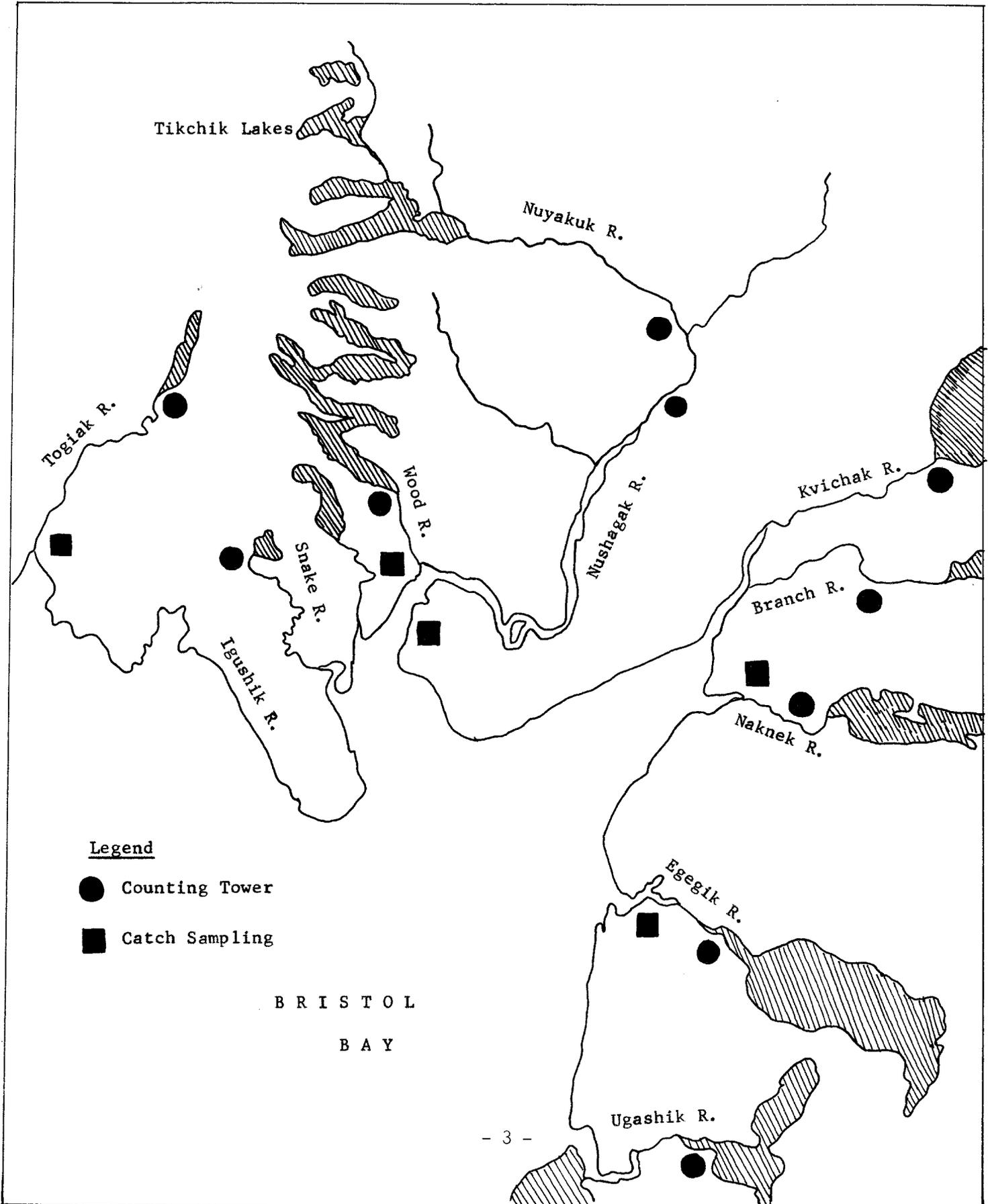
Species	Catch	Escapement ^{1/}	Total Run ^{2/}
<u>NUSHAGAK DISTRICT</u>			
Kings	96,240	50 - 80,000	146 - 176,000
Chums	338,286	50 - 70,000	388 - 408,000
Cohos	31,517	-	-
<u>TOGIAK DISTRICT</u>			
Kings	13,381	6 - 8,000	19 - 21,000
Chums	63,322	153,000	216,000
Cohos	18,159	10,000	28,000

^{1/} Escapement estimate based on aerial survey of spawning grounds.

^{2/} Rounded to nearest thousand.

Figure 1

APPROXIMATE LOCATIONS OF CATCH SAMPLING AND COUNTING TOWERS
BRISTOL BAY, 1967



Smokey Joe's, Inc. in the Nushagak district and at Togiak Fisheries, Inc. in the Togiak district. The cannery fish samples were taken by selecting fish randomly from the conveyor belts as the salmon moved into the cannery storage bins. The only exception to the method of selecting samples was at Togiak where king salmon were randomly selected from the cannery docks as the catches were delivered and at Nushagak where early-run kings and late-run coho salmon were randomly selected from the processor's dock as the catches were delivered.

The catch samplers were instructed to sample as many fish as possible, but not over 500 fish per species for each fishing period. Furthermore, the Nushagak sampler was instructed to concentrate on the king salmon fishery, while the Togiak sampler was instructed to concentrate on the red salmon fishery. Escapement samples were not collected in 1967.

Remarks appropriate to each district are included with the data from that district.

Both the Gilbert-Rich and European age designations are used throughout this paper. In all age composition tables the European notation is placed over the Gilbert-Rich notation. All sex and age composition tables are weighted by the commercial catch.

It is the purpose of this report to present all available statistics in a form which will serve the needs of scientists concerned with these fisheries. No attempt will be made to draw conclusions or discuss the merits or shortcomings of the data collection procedures.

NUSHAGAK DISTRICT

The Igushik section of the Nushagak district was both enlarged and closed to commercial fishing during the period from June 19 to July 8. The remainder of the Nushagak district remained similar to that of 1966 (Figure 2). Table 3 shows the final commercial catch other than red salmon for 1967 by species and period.

King Salmon

For the second consecutive year the harvest of early-run king salmon was affected by price negotiations between fishermen and processors. How-

Figure 2. 1967 NUSHAGAK COMMERCIAL FISHING DISTRICT.

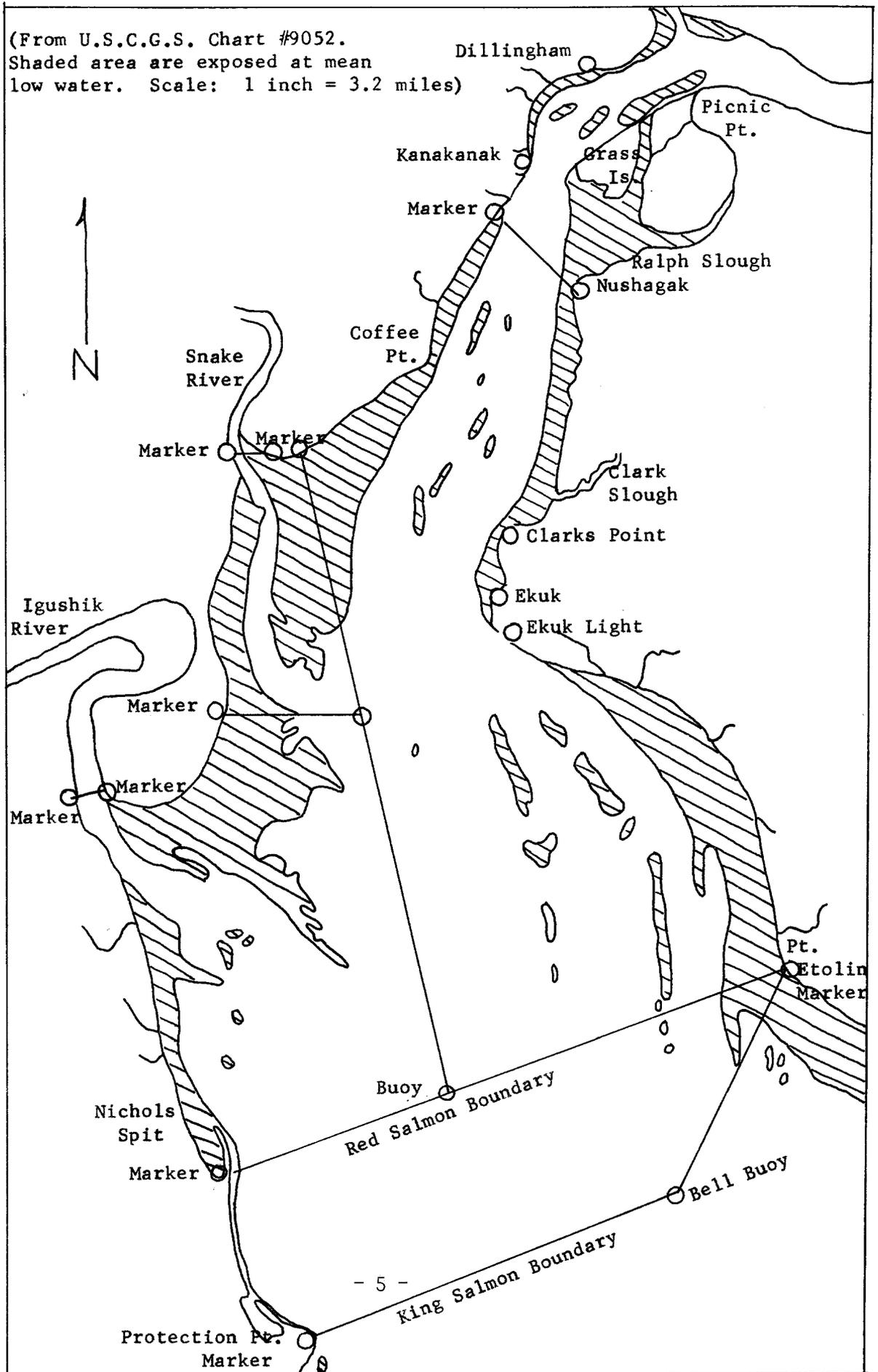


Table 3. Nushagak district final commercial catch other than red salmon by species and period, 1967.

Period	Hours	Catch by Species				Total
		Kings	Chums	Pinks	Cohos	
5/29 - 6/3	5 days	2,888				2,888
6/5 - 10	5 days	9,216				9,216
6/12 - 17	5 days	22,980	333	2		23,315
6/19 - 22	3 days	30,514	14,677	31		45,222
6/24 - 25	24	17,212	43,605	24		60,841
6/29	12	9,452	63,756	3		73,211
7/4 - 5	24	1,262	45,577	6		46,845
7/8 - 12 ^{1/}	103	86	2,045	42	1	2,174
7/12 - 16	5 days	2,118	146,621	76	72	148,887
7/17 - 22	5 days	329	20,590	62	757	21,738
7/24 - 29	5 days	131	563	8	3,886	4,588
7/31 - 8/5	5 days	43	491	7	20,441	20,982
8/7		9	28	4	6,360	6,401
Totals		96,240	338,286	265	31,517	466,308
Percent of district catch		20.6	72.5	0.1	6.8	100.0

^{1/} Igushik section only.

ever, unlike 1966, the price dispute did not appreciably lower the early season catch, as two fresh/frozen processing ships were present in the district as well as one shore plant, which shipped fresh king salmon to Anchorage.

Fishing effort participating in the 1967 fishery totaled 271 drift boats, which was comparable to the previous year. The total catch of 96,240 king salmon was the second highest catch in the last 17 years and was 37 percent higher than the average catch for this period (1951 - 1967).

Most probable total escapement to the district after analysis of spawning ground surveys, commercial and subsistence catches and partial tower counts at the Nushagak River counting station was between 50 - 80,000 (Table 2).

Tables 4 through 7 present sex and age composition of the 1967 king salmon commercial catch. Lengths were recorded from the 2,546 fish sampled and are available upon request. Average weight was 21.0 pounds, which was determined by weighing 971 king salmon throughout the season.

Chum Salmon

The catch of 338,286 chum salmon in 1967 was the largest since 1964 and was 37 percent higher than the average catch for the past 17 years (1951-1967).

The enumeration of chum salmon at the Nushagak River counting station in 1967 was considered minimal due to the poor counting conditions and the migratory behavior of the chum salmon. Most probable total escapement to the district was in the range of 50 - 70,000 chum salmon (Table 2).

Tables 8 through 11 present sex and age composition of the 1967 chum salmon commercial catch. Length frequencies were recorded from the 1,879 fish sampled and are available upon request. Average weight of 447 fish sampled randomly throughout the season was 6.6 pounds.

Coho Salmon

The catch of 31,517 coho salmon was the largest since 1958 and represented a 16 percent increase over the past 17 year average (1951 - 1967). The increased catch was primarily due to increased effort on this late-run species.

No data was collected regarding coho salmon escapement.

Tables 12 through 15 present sex and age composition of the 1967 coho salmon commercial catch. Length frequencies were recorded from the 1,065 fish sampled and are available upon request. Average weight of 473 fish sampled randomly throughout the season was 7.0 pounds.

Table 4. Sex composition of Nushagak district king salmon commercial catch by period, 1967.

Period	No. of Samples	No. in Samples		Percent		Commercial Catch	No. in Catch	
		Males	Females	Males	Females		Males	Females
5/29 - 6/10	14	260	220	54.2	45.8	12,104	6,560	5,544
6/12 - 17	15	321	249	56.3	43.7	22,980	12,938	10,042
6/19 - 22	16	388	191	67.0	33.0	30,514	20,444	10,070
6/24 - 25	14	415	138	75.0	25.0	17,212	12,909	4,303
6/29 - 8/19	10	273	91	75.0	25.0	13,430	10,073	3,357
Weighted Totals	69	1,657	889	65.4	34.6	96,240	62,924	33,316

Table 5. Age composition of Nushagak district
male king salmon commercial catch
by period, 1967

Period	No. of Samples	No. of Fish	Percent by Age Group*									Totals
			0.3	1.2	0.4	1.3	0.5	1.4	2.3	1.5	2.4	
			41	42	51	52	61	62	63	72	73	
5/29-6/10	14	208	-	1.9	0.5	41.4	-	49.5	1.9	4.3	0.5	100.0
6/12-17	15	262	1.2	14.5	1.9	45.4	0.8	34.7	-	1.5	-	100.0
6/19-22	16	345	1.5	38.8	1.7	32.2	-	24.3	-	1.5	-	100.0
6/24-25	14	366	2.2	48.3	0.5	30.9	-	15.6	0.3	2.2	-	100.0
6/29-8/19	10	238	3.4	46.2	1.2	33.2	0.4	13.9	-	1.7	-	100.0
Totals	69	1,419										
Weighted Percentages			1.7	33.1	1.3	35.8	0.2	25.6	0.3	2.0	0.0	100.0

* Top row is European system of age designation. Bottom row is Gilbert-Rich system.

Table 6. Age composition of Nushagak district
female king salmon commercial catch
by period, 1967

Period	No. of Samples	No. of Fish	Percent by Age Group									Totals
			0.3 4 ₁	0.4 5 ₁	1.3 5 ₂	0.5 6 ₁	1.4 6 ₂	2.3 6 ₃	1.5 7 ₂	2.4 7 ₃	1.6 8 ₂	
5/29-6/10	14	175	-	-	6.3	-	81.1	-	10.3	2.3	-	100.0
6/12-17	15	204	0.5	4.9	7.8	0.5	74.5	0.5	11.3	-	-	100.0
6/19-22	16	148	0.7	5.4	8.1	-	77.0	-	8.1	0.7	-	100.0
6/24-25	14	115	0.9	2.6	13.9	-	71.3	-	10.4	-	0.9	100.0
6/29-8/19	10	70	-	2.9	12.9	-	67.1	1.4	15.7	-	-	100.0
Totals	69	712										
Weighted Percentages			0.5	3.7	8.9	0.2	75.2	0.3	10.5	0.6	0.1	100.0

Table 7. Age composition of Nushagak district
king salmon commercial catch by period
both sexes combined, 1967

Period	No. of Samples	No. of Fish	Percent by Age Group										Totals
			0.3	1.2	0.4	1.3	0.5	1.4	2.3	1.5	2.4	1.6	
			4_1	4_2	5_1	5_2	6_1	6_2	6_3	7_2	7_3	8_2	
5/29-6/10	14	383	-	1.0	0.3	25.3	-	64.0	1.0	7.1	1.3	-	100.0
6/12-17	15	466	0.9	8.2	3.2	29.0	0.6	52.1	0.2	5.8	-	-	100.0
6/19-22	16	493	1.2	27.2	2.8	25.0	-	40.2	-	3.4	0.2	-	100.0
6/24-25	14	481	1.9	36.8	1.0	26.8	-	28.9	0.2	4.2	-	0.2	100.0
6/29-8/19	10	308	2.6	35.7	1.6	28.6	0.3	26.0	0.3	4.9	-	-	100.0
Totals	69	2,131											
Weighted Percentages			1.3	22.3	2.1	26.8	0.2	42.0	0.3	4.8	0.2	0.0	100.0

Table 8. Sex composition of Nushagak district chum salmon commercial catch by period, 1967.

Period	No. of Samples	No. in Sample		Percent		Commercial Catch	No. in Catch	
		Males	Females	Males	Females		Males	Females
> 6/25	10	137	181	43.1	56.9	58,615	25,263	33,352
6/29	11	160	248	39.2	60.8	63,756	24,992	38,764
7/4 - 12	9	104	193	35.0	65.0	47,622	16,668	30,954
7/13 >	22	242	614	28.3	71.7	168,293	47,627	120,666
Weighted Totals	52	643	1,236	33.9	66.1	338,286	114,550	223,736

Table 9. Age composition of Nushagak district male chum salmon commercial catch by period, 1967.

Period	No. of Samples	No. of Fish	Percent by Age Group			Totals
			0.2	0.3	0.4	
			3 ₁	4 ₁	5 ₁	
> 6/25	10	127	1.6	92.9	5.5	100.0
6/29	11	147	-	92.5	7.5	100.0
7/4 - 12	9	94	7.4	87.2	5.4	100.0
7/13 >	22	230	5.6	88.3	6.1	100.0
Totals	52	598				
Weighted Percentages			3.7	90.1	6.2	100.0

Table 10. Age composition of Nushagak district female chum salmon commercial catch by period, 1967.

Period	No. of Samples	No. of Fish	Percent by Age Group			Totals
			0.2	0.3	0.4	
			3 ₁	4 ₁	5 ₁	
> 6/25	10	160	-	82.5	17.5	100.0
6/29	11	223	0.5	92.8	6.7	100.0
7/4 - 12	9	170	4.1	91.8	4.1	100.0
7/13 >	22	566	5.3	88.3	6.4	100.0
Totals	52	1,119				
Weighted Percentages			3.5	88.7	7.8	100.0

Table 11. Age composition of Nushagak district chum salmon commercial catch by period, both sexes combined, 1967.

Period	No. of Samples	No. of Fish	Percent by Age Group			Totals
			0.2	0.3	0.4	
			3 ₁	4 ₁	5 ₁	
> 6/25	10	287	0.7	87.1	12.2	100.0
6/29	11	370	0.3	92.7	7.0	100.0
7/4 - 12	9	264	5.3	90.2	4.5	100.0
7/13 >	22	796	5.4	88.3	6.3	100.0
Totals	52	1,717				
Weighted Percentages			3.6	89.2	7.2	100.0

Table 12. Sex composition of Nushagak district coho salmon commercial catch by period, 1967.

Period	No. of Samples	No. in Sample		Percent		Commercial Catch	No. in Catch	
		Males	Females	Males	Females		Males	Females
> 7/29	5	80	94	46.0	54.0	4,716	2,169	2,547
7/31 - 8/5	12	238	242	49.6	50.4	20,441	10,139	10,302
8/7 >	13	197	214	47.9	52.1	6,360	3,046	3,314
Weighted Totals	30	515	550	48.7	51.3	31,517	15,354	16,163

Table 13. Age composition of Nushagak district male coho salmon commercial catch by period, 1967.

Period	No. of Samples	No. of Fish	Percent by Age Group		Totals
			1.1	2.1	
			3 ₂	4 ₃	
> 8/5	17	177	1.7	98.3	100.0
8/7 >	13	136	0.7	99.3	100.0
Totals	30	313			
Weighted Percentages			0.8	99.2	100.0

Table 14. Age composition of Nushagak district female coho salmon commercial catch by period, 1967.

Period	No. of Samples	No. of Fish	Percent by Age Group		Totals
			1.1	2.1	
			3 ₂	4 ₃	
> 8/5	17	173	1.2	98.8	100.0
8/7 >	13	137	0.7	99.3	100.0
Totals	30	310			
Weighted Percentages			0.8	99.2	100.0

Table 15. Age composition of Nushagak district coho salmon commercial catch by period, both sexes combined, 1967.

Period	No. of Samples	No. of Fish	Percent by Age Group		Totals
			1.1	2.1	
			32	43	
> 8/5	17	350	1.4	98.6	100.0
8/7 >	13	273	0.7	99.3	100.0
Totals	30	623			
Weighted Percentages			0.8	99.2	100.0

TOGIAC DISTRICT

The fishing area in the Togiak district remained similar to that of 1966 (Figure 3). Of seven subsections open to fishing in 1967 only three were fished all season: Togiak, Osviak, and Kulukak with the Togiak River section accounting for over 71 percent of the commercial catch. Catch statistics were gathered only on the king and chum salmon fishery.

King Salmon

A record king salmon harvest of 13,381 was taken in 1967, with the majority of the kings being caught in the Togiak River section (Table 16). Aerial survey estimates of the escapement indicated a spawning population of approximately 6 - 8,000 in the entire district (Table 2).

Sex and age composition of the 1967 king salmon commercial catch are presented in Tables 17 through 20. Lengths were recorded from the 443 fish sampled and are available upon request. Average weight of 32 fish was 21.3 pounds.

Chum Salmon

Chum salmon are taken concurrently with the red salmon fishery in the

Figure 3. 1967 TOGIAK COMMERCIAL FISHING DISTRICT

(From U. S.C.G.S. Chart #8802.
Shaded areas are exposed at mean
low water. Scale: 1 inch = 10 miles)

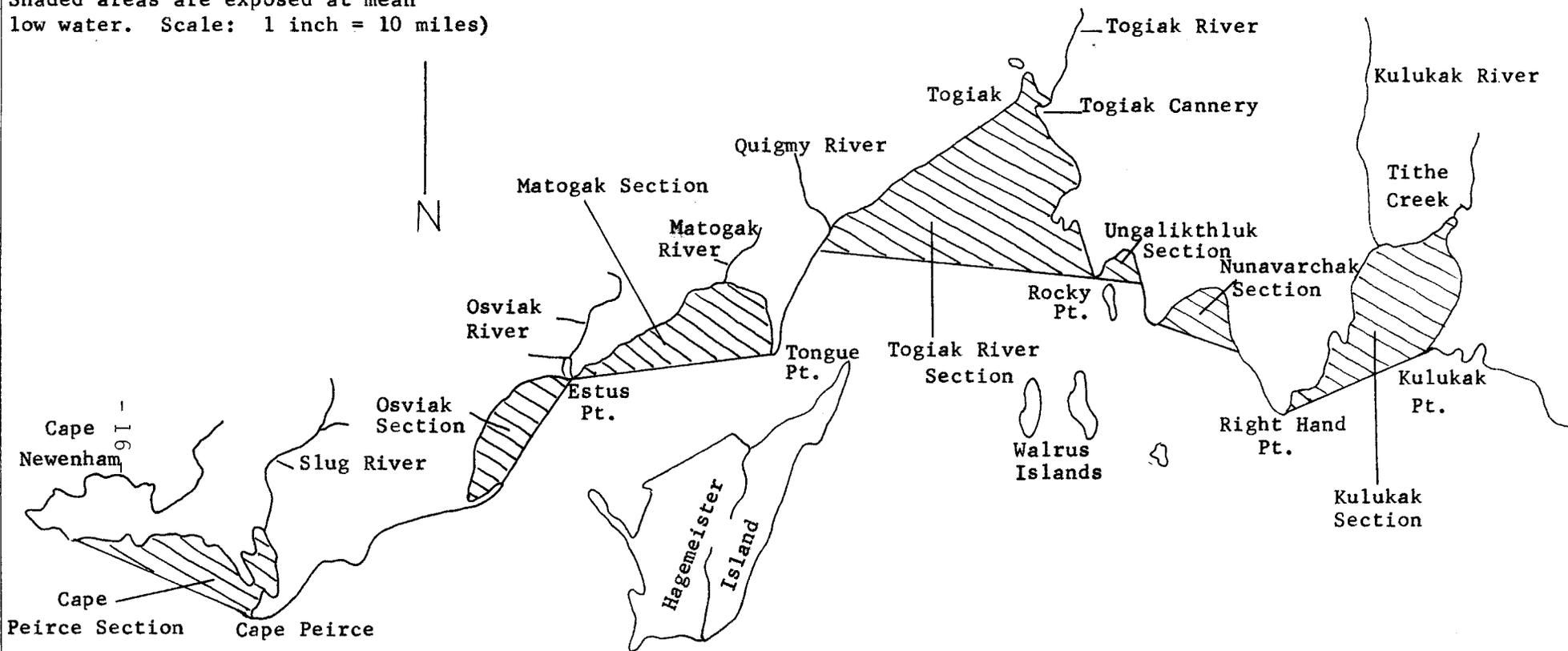


Table 16. Togiak district final commercial catch
by species and period, 1967^{1/}

Period	Hours	Catch by Species				Total
		Kings	Chums	Pinks	Cohos	
6/12-16	4 days	1,348	703	67		2,118
6/19-23	4 days	4,846	2,553	147		7,546
6/26-30	4 days	3,654	8,650	252		12,556
7/3-7	4 days	3,060	14,374	227		17,661
7/10-14	2 days	359	11,650	82		12,091
7/17-22 ^{2/}	5 days	28	5,296	31		5,355
7/24-28	4 days	58	14,590	15	6	14,669
7/31-8/5	5 days	26	4,496	7	91	4,620
8/7-12	5 days	2	946	1	243	1,192
8/14-19	5 days		64		2,314	2,378
8/21-26	5 days				5,579	5,579
8/28-9/2	5 days				5,305	5,305
9/4-9	5 days				4,621	4,621
Totals		13,381	63,322	829	18,159	95,691
Percent of district catch		14.0	66.1	0.9	19.0	100.0

^{1/} Includes 332 Cape Pierce Fish: 1 King, 329 Chums, and 2 Pinks.
Includes 16,231 Osviak Fish: 208 Kings, 15,813 Chums, 3 Cohos, and 207 Pinks.
Includes 10,452 Kulukak Fish: 850 Kings, 9,388 Chums, and 214 Pinks.

^{2/} Osviak section only.

Table 17. Sex composition of Togiak district king salmon commercial catch by period, 1967.

Period	No. of Samples	No. in Sample		Percent		Commercial Catch	No. in Catch	
		Males	Females	Males	Females		Males	Females
6/12 - 23	8	123	131	48.4	51.6	6,194	2,998	3,196
6/26 >	8	99	90	52.4	47.6	7,187	3,766	3,421
Weighted Totals	16	222	221	50.5	49.5	13,381 ^{1/}	6,764	6,617

^{1/} Includes 850 kings from Kulukak section, 208 kings from Osviak section and 1 king from Cape Pierce section.

Table 18. Age composition of Togiak district male king salmon commercial catch by period, 1967.

Period	No. of Samples	No. of Fish	Percent by Age Group						Totals
			1.2	1.3	1.4	2.3	1.5	2.4	
			4 ₂	5 ₂	6 ₂	6 ₃	7 ₂	7 ₃	
6/12 - 23	8	102	2.0	12.7	75.5	1.0	5.9	2.9	100.0
6/26 >	8	85	18.8	17.6	53.0	-	5.9	4.7	100.0
Totals	16	187							
Weighted Percentages			11.4	15.4	63.0	0.4	5.9	3.9	100.0

Table 19. Age composition of Togiak district female king salmon commercial catch by period, 1967.

Period	No. of Samples	No. of Fish	Percent by Age Group				Totals
			1.3	1.4	1.5	2.4	
			5 ₂	6 ₂	7 ₂	7 ₃	
6/12 - 23	8	104	1.0	88.4	5.8	4.8	100.0
6/26 >	8	73	5.5	84.9	8.2	1.4	100.0
Totals	16	177					
Weighted Percentages			3.3	86.6	7.0	3.1	100.0

Table 20. Age composition of Togiak district king salmon commercial catch by period, both sexes combined, 1967.

Period	No. of Samples	No. of Fish	Percent by Age Group						Totals
			1.2	1.3	1.4	2.3	1.5	2.4	
			4 ₂	5 ₂	6 ₂	6 ₃	7 ₂	7 ₃	
6/12 - 23	8	206	1.0	6.8	82.0	0.5	5.8	3.9	100.0
6/26 >	8	158	10.1	12.0	67.7	-	7.0	3.2	100.0
Totals	16	364							
Weighted Percentages			5.9	9.6	74.3	0.2	6.5	3.5	100.0

Togiak district. With the poor red salmon forecast, fishing time was restricted to four days per week in the Togiak and Kulukak subsections. Further restrictions on fishing time were necessary to attain red salmon escapement goals and as a result the chum salmon catch was the lowest since 1959. Total chum salmon catch was 63,322, with the majority being taken in the Togiak River subsection.

Aerial surveys of spawning grounds were flown in all of the important chum salmon producing systems in the Togiak district and the total chum salmon escapement was estimated to be 153,000 (Table 2).

Tables 21 through 24 present sex and age composition of the 1967 chum salmon commercial catch. Length frequencies were recorded from 1,336 fish and are available upon request. Average weight of 265 chum salmon sampled throughout the season was 7.0 pounds.

Table 21. Sex composition of Togiak district chum salmon commercial catch by period, 1967.

Period	No. of Samples	No. in Sample		Percent		Commercial Catch	No. in Catch	
		Males	Females	Males	Females		Males	Females
6/12 - 7/1	9	113	146	43.6	56.4	11,906	5,191	6,715
7/3 - 15	10	96	198	32.7	67.3	26,024	8,510	17,514
7/17 - 29	19	222	460	32.6	67.4	19,886	6,483	13,403
7/31 >	4	31	70	30.7	69.3	5,506	1,690	3,816
Weighted Totals	42	462	874	34.5	65.5	63,322	21,874	41,448

Table 22. Age composition of Togiak district male chum salmon commercial catch by period, 1967.

Period	No. of Samples	No. of Fish	Percent by Age Group				Totals
			0.2	0.3	0.4	0.5	
			3 ₁	4 ₁	5 ₁	6 ₁	
6/12 - 7/1	9	111	3.6	69.4	27.0	-	100.0
7/3 - 15	10	92	8.7	78.3	10.8	2.2	100.0
7/17 - 29	19	210	37.1	57.2	5.7	-	100.0
7/31 >	4	29	58.6	37.9	3.5	-	100.0
Totals	42	442					
Weighted Percentages			19.7	66.8	12.6	0.9	100.0

Table 23. Age composition of Togiak district female chum salmon commercial catch by period, 1967.

Period	No. of Samples	No. of Fish	Percent by Age Group			Totals
			0.2	0.3	0.4	
			3 ₁	4 ₁	5 ₁	
6/12 - 7/1	9	139	1.4	73.4	25.2	100.0
7/3 - 15	10	189	2.1	80.4	17.5	100.0
7/17 - 29	19	440	26.4	68.6	5.0	100.0
7/31 >	4	68	42.6	55.9	1.5	100.0
Totals	42	836				
Weighted Percentages			13.6	73.2	13.2	100.0

Table 24. Age composition of Togiak district
 chum salmon commercial catch
 by period, both sexes combined, 1967

Period	No. of Samples	No. of Fish	Percent by Age Group				Totals
			0.2	0.3	0.4	0.5	
			31	41	51	61	
6/12-7/1	9	250	2.4	71.6	26.0	-	100.0
7/3-15	10	281	4.3	79.7	15.3	0.7	100.0
7/17-29	19	650	29.9	64.9	5.2	-	100.0
7/31 >	4	97	47.4	50.5	2.1	-	100.0
Totals	42	1,278					
Weighted Percentages			15.7	71.0	13.0	0.3	100.0

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