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ARCTIC-YUKON-KUSKOKWIM REGION

SALMON FISHERY REPORT

A REPORT TO THE
ALASKA BOARD OF FISHERIES

December 1977

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES

INTRODUCTION

The Arctic-Yukon-Kuskokwim Region is that portion of the state north of the Alaska Range and the Bristol Bay drainage. It includes all of the drainages of the Bering Sea and the Arctic Ocean from Cape Newenham to the U.S.-Canadian border. In addition, it includes the following Bering Sea Islands: Nunivak, St. Lawrence and St. Matthew. This is the largest management region in the state comprising over 400,000 square miles, which is equal to the combined areas of California, Oregon, Washington and Idaho. The region is subdivided into several management areas or districts as indicated in Figure 1.

There are approximately 30,000-40,000 Eskimo and Indian people in the region, the majority of whom reside in excess of 110 small villages scattered along the coast and the major river systems. Nearly all of these native people are dependent to varying degrees on the fish and game resources for their livelihood.

REGIONAL SUMMARY

Commercial Fishery

A harvest of 2.0 million salmon was made in the region during 1977 which was exceeded only by the catches made in 1974 and 1975 of 2.4 and 2.2 million fish, respectively. Catches of chum salmon were also the third largest ever recorded. A record coho salmon catch of 305,300 was made in 1977 exceeding the previous high catch in 1974 by more than 100,000 fish. The 1977 harvest represented 17.0 million pounds (round weight) of salmon. Fishermen earnings totaled a record \$9.1 million, more than double that reported in 1976.

The 1977 commercial catches made in each management area are shown below:

<u>Area</u>	<u>King</u>	<u>Red</u>	<u>Coho</u>	<u>Pink</u>	<u>Chum</u>	<u>Total</u>
Kuskokwim	58,256	18,621	263,727	434	298,959	639,997
Yukon	96,414	-	38,021	-	797,661	932,096
Norton Sound	4,413	-	3,574	49,631	202,164	259,782
Kotzebue	-	-	-	-	195,895	195,895
Totals	159,083	18,621	305,322	50,065	1,494,679	2,027,770
Previous Season Record	161,500 (1967)	29,000 (1974)	198,500 (1974)	208,600 (1974)	1,984,600 (1975)	2,436,700 (1974)
5 Year Average (1972-76)	127,800	14,100	136,700	92,800	1,391,300	1,762,700

Commercial harvests in the region have increased about thirty times since 1960. Recent increases have been largely due to development of chum salmon fisheries in the Yukon River, Kuskokwim River and Kotzebue areas.

The region-wide license registration in 1977 of 3,125 commercial, 2,151 gear and 2,028 fishing vessel licenses represent decreases of 1.7, 9.3 and 9.8 percent compared to 1976. This decline is attributed to implementation of the limited entry program. License registration in the region increased at a rate of about 6 percent annually during the 1968-72 period. During the 1973-75 period vessel and gear license registration increased approximately 20 and 10 percent annually respectively over that for the previous five years. Most of this increase was in the Kuskokwim, Kotzebue and upper Yukon areas. This expansion was largely the result of increasing numbers of subsistence fishermen who entered the commercial fishery. The vast majority of commercial fishermen are Eskimo and Indian residents of the region.

Trends in license registrations and commercial harvests in the region during 1960-1977 are illustrated in Figure 2.

Figure 3 shows commercial, subsistence and total catches of king and other salmon species made in the region during 1960-1977.

Subsistence Fishery

Subsistence harvest information prior to 1960 is incomplete or entirely lacking for many years, but there are also records indicating that in excess of two million salmon annually were taken during the early 1900's.

About 1930 the airplane began replacing the sled dog as a mail carrier, and this started the gradual decline of the subsistence salmon fishery. This decline was accelerated during the 1966-73 period as increased welfare payments and employment opportunities, including commercial fishing activities, became available to the native people (Figure 3). Another very important factor tending to affect subsistence fishing effort during this period was the increased use of snow vehicles which replaced sled dogs at a faster rate than did the airplane. Since considerable numbers of salmon and other fish are fed to sled dogs, fewer fish were required for subsistence purposes as the canine population declined. The decline in subsistence fishing was not related necessarily to fish abundance, but mainly reflects decreases in effort and dependence due to a changing way of life. Coincidental with the legislation of subsistence salmon roe sales in 1974-77, catches during this recent period have increased substantially compared to the relatively small catches made the previous four years.

Subsistence catch data for 1977 is very preliminary at this time since a few late catch reports are still being received. The projected 1977 harvest should approximate 630,000 salmon, a slight increase compared

to the 1976 catch. The average annual subsistence harvest recorded during 1961-1976 was 620,000 salmon (Figure 3).

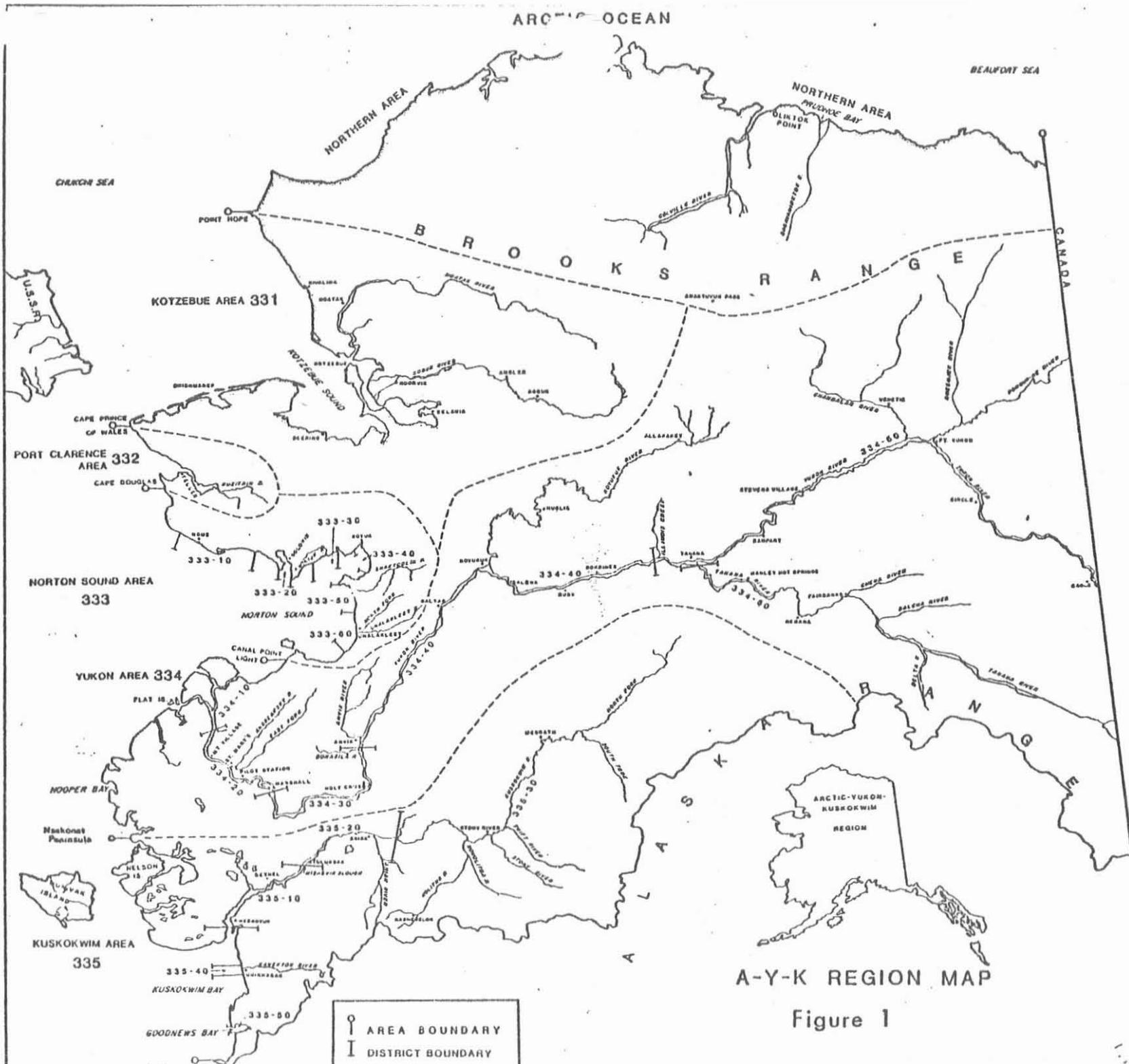


Fig 2. Total commercial salmon catch and fishing vessel registration for the Arctic-Yukon-Kuskokwim Region. 1960-1977.

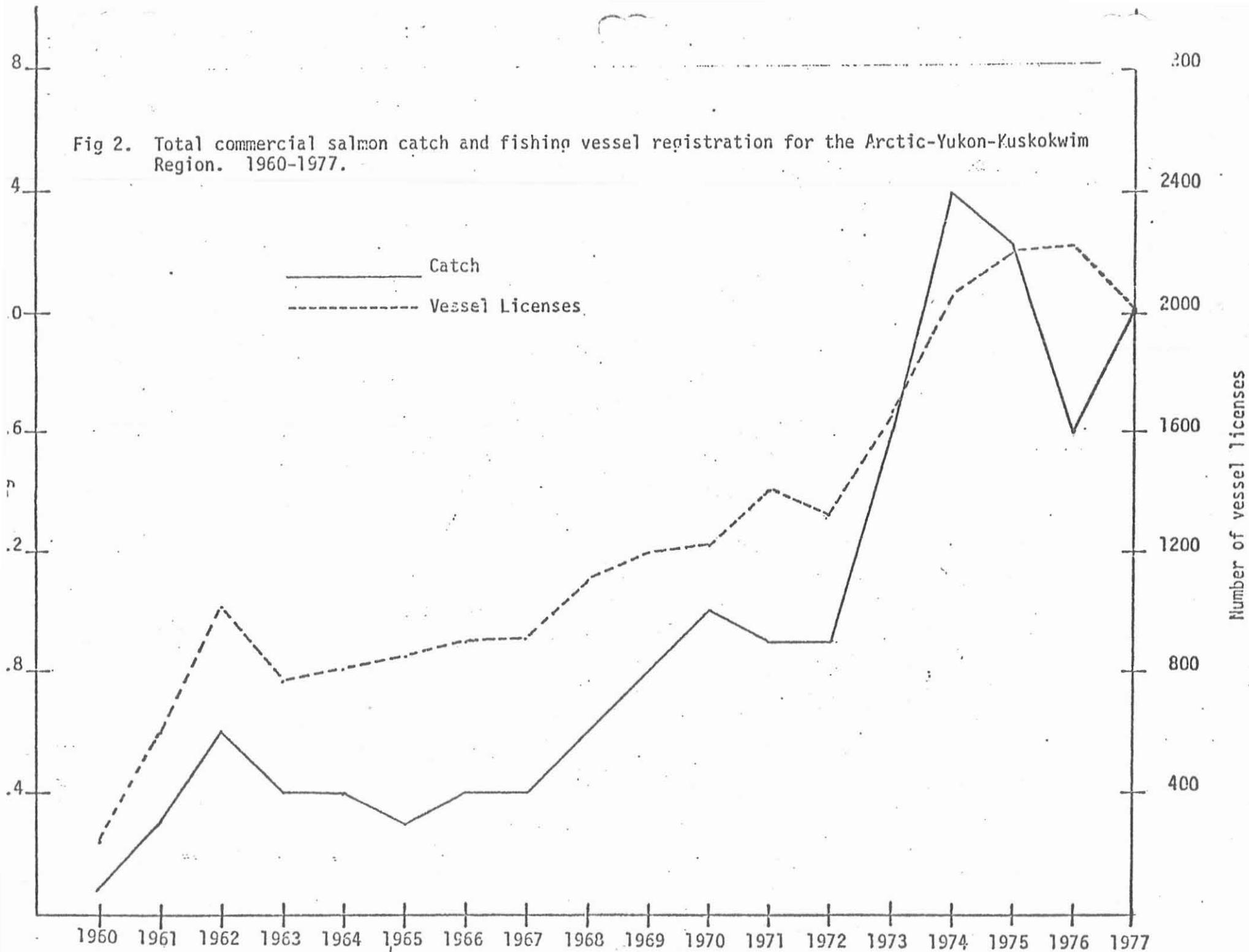
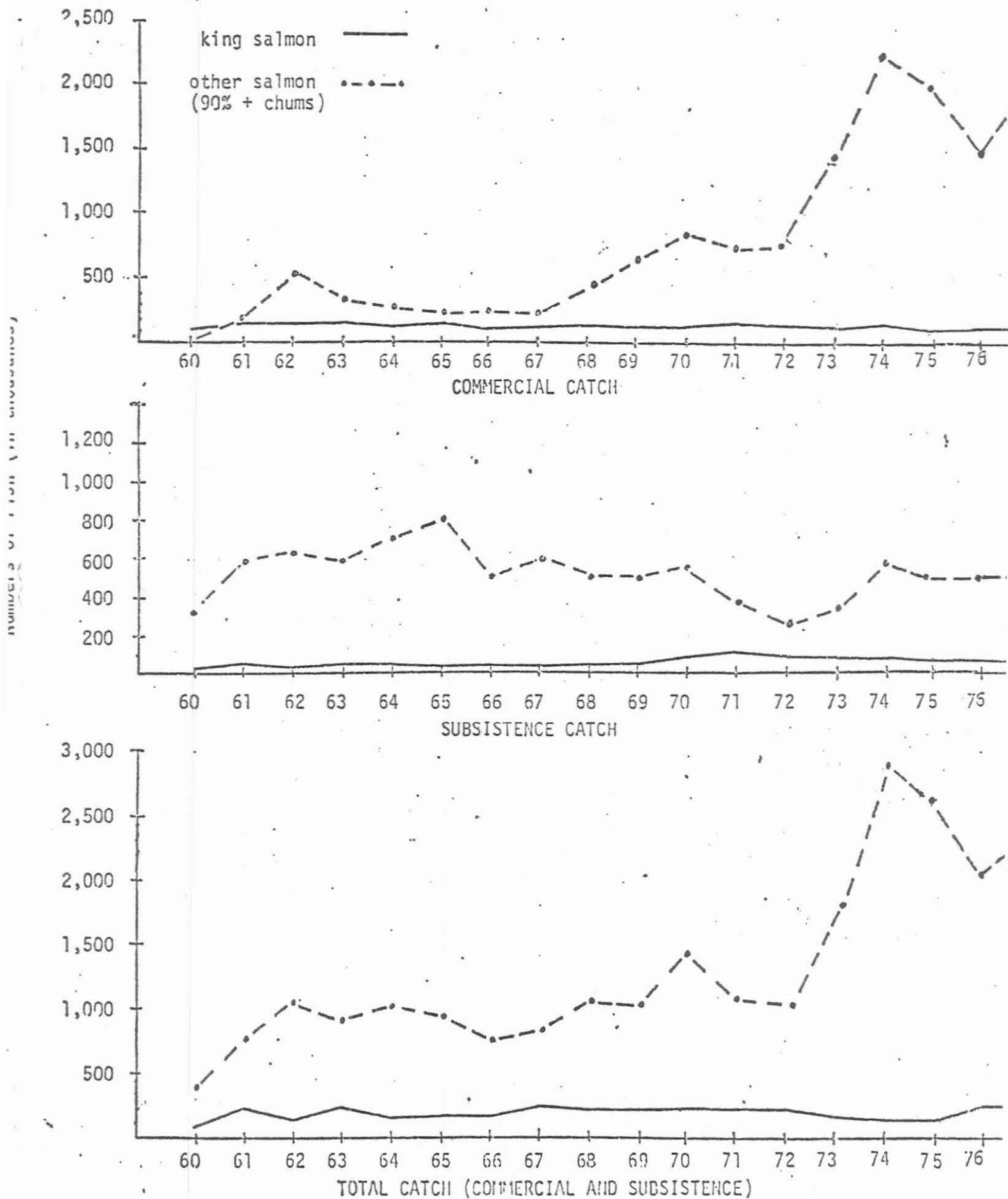


Figure 3. Commercial, subsistence and total catch in numbers of salmon for the Arctic-Yukon-Kuskokwim region, 1960-1977.



Kuskokwim Area

The 1977 Kuskokwim area commercial salmon harvest of 639,997 fish was the largest catch ever recorded. Species composition was 58,256 king, 18,621 red, 263,727 coho, 434 pink and 298,959 chum salmon. The coho and chum salmon catches were the highest ever recorded. Table 1 presents commercial catches for the Kuskokwim River, Quinhagak and Goodnews Bay subdistricts.

Most license registration dropped below record 1974 levels. Commercial license registration increased (9.0 per cent) to 1,258, but vessel licenses decreased 17.4 per cent to 822 licenses. Gear licenses (set and drift combined) fell 16.7 per cent below the record 1974 levels to 769 units of gear. A total of 836 Commercial Fisheries Entry permits were issued to gillnet operators in 1977.

Kuskokwim River

In 1977 the combined commercial and subsistence king salmon catch of 91,076 fish was the second largest ever recorded (Table 2). The commercial harvest of 35,830 kings was 20 percent above the recent five year average. The majority of comparative catch and escapement data indicate that the 1977 king salmon run was above average compared to recent years. In an attempt to reverse the decline in recent year escapements and in view of an increase in fishing effort (Table 3) and efficiency, the commercial king salmon harvest goal in subdistrict 335-10 was revised downward to 20,000 fish (except during years of high abundance) beginning in 1975. Also fishing time has been severely restricted in recent years. In 1977 the commercial fishery during the king salmon season in subdistrict 335-10 was limited to only two 6 hour fishing periods. However this reduction in fishing time was also influenced by an indicated large subsistence harvest (influenced by roe sales) being made.

Although the commercial chum salmon fishery has increased tremendously since its inception in 1971, the subsistence fishery is still of prime importance. Commercial and subsistence effort and catches have increased greatly in recent years, resulting in the institution of a combined harvest goal in subdistrict 335-10 of approximately 400,000 fish for the 1977 season. This season's chum salmon run was judged above average, the harvest of 248,721 fish was strongly influenced by both a commercial effort (Table 3) that has increased 53 percent since 1973 and record prices for the catch. Due to the increased effort and efficiency of the fleet, commercial fishing was limited to five 6-hour periods. When commercial catches are added to subsistence catches, the total utilization of 442,918 was the second largest documented catch since 1960 (Table 4).

The coho salmon run this year was also judged substantially above average in magnitude. Additionally commercial coho salmon fishing effort was the largest on record with 572 fishermen participating (Table 4). The commercial coho salmon catch of 237,658 fish was 61 percent above the previous record 1974 catch of 147,260 cohos.

The Kuskokwim River subsistence king salmon harvest of 55,246 kings was above the recent 5-year average catch of 42,207 fish. The subsistence chum salmon harvest of 194,197 was similar to the recent 5-year average catch of 195,385.

The sale of subsistence salmon roe was allowed under strict management and regulatory controls during 1977. A total of 50,965 pounds of king salmon roe and 116,190 pounds of chum roe was sold. The catch represented 38,991 kings and 228,986 chums. Preliminary information indicates that subsistence harvests decreased tremendously when the roe

sales were terminated by emergency order. This tends to infer the presence of a "roe fishery".

Water levels in 1977 were at record highs in some portions of the Kuskokwim district. Aerial surveys of streams where water conditions were not turbid indicated good escapements of king salmon. The Kogrukluuk River counting tower count of 1,988 kings compared favorably to other peak years although high water precluded counting for several days. Table 5 presents comparative index counts. Escapements of chum salmon were judged as very good.

Quinhagak and Goodnews Bay

These two fisheries are located south of the Kuskokwim River (Figure 1). Fishermen in these subdistricts are restricted to the use of gill nets of less than 6-inch stretched mesh. A total of 22,426 kings, 9,242 reds, 22,363 cohos, 231 pinks and 50,238 chums, totaling 104,500 fish were harvested in 1977. Harvest of kings, cohos and chums were above average.

Although information is limited, escapements of king salmon were good. Escapements of other species were judged above average.

Outlook for 1978

Based on brood year catch and escapement data, the return of king salmon to the Kuskokwim River in 1978 is expected to be below average to average in magnitude. Limited comparative brood year escapement data is available for Kuskokwim River chum and coho stocks. Brood year comparative commercial catch data indicate an average return of chum and coho salmon in 1978.

Table 1. Kuskokwim district commercial catches by drainage, 1960-1977

Kuskokwim River ^{1/}	King	Red	Coho	Pink	Chum	Total
1960	5,969	0	2,498	0		8,467
1961	18,918	0	5,044	0		23,962
1962	15,341	0	12,432	0		27,773
1963	12,016	0	15,660	0		27,676
1964	17,149	0	28,613	0		45,762
1965	21,989	0	12,191	0		34,180
1966	25,545	0	22,985	0		48,530
1967	29,986	0	56,313	0	148	86,447
1968	34,278	0	127,306	0	187	161,771
1969	43,997	322	83,765	0	7,165	135,249
1970	39,290	117	38,601	44	1,664	79,716
1971	40,274	2,606	5,253	0	68,914	117,047
1972	39,454	102	22,579	8	78,619	140,762
1973	32,838	369	130,876	33	148,746	312,862
1974	18,664	136	147,260	37	171,887	337,984
1975 ^{4/}	21,720	23	81,945	10	181,840	285,538
1976	30,735	2,971	88,501	133	177,864	300,204
1977	35,830	9,373	241,364	203	248,721	535,497
5 year average	28,682	720	94,232	44	151,791	275,470
Quinagak (Kanektok R.) ^{2/}	King	Red	Coho	Pink	Chum	Total
1960	0	5,649	3,000	0	0	8,649
1961	4,328	2,308	46	90	18,864	25,636
1962	5,526	10,313	0	4,340	45,707	65,886
1963	6,555	0	0	0	0	6,555
1964	4,081	13,422	379	939	707	19,528
1965	2,976	1,886	0	0	4,242	9,104
1966	278	1,030	0	268	2,610	4,186
1967	0	652	1,926	0	8,087	10,665
1968	8,879	5,884	21,511	75,818	19,497	131,589
1969	16,802	3,784	15,077	953	39,206	74,822
1970	18,629	5,393	16,850	15,195	46,556	102,623
1971	4,185	3,118	2,982	13	30,208	40,506
1972	15,880	3,286	376	1,878	17,247	38,667
1973	14,993	2,783	16,515	277	19,680	54,248
1974	8,704	19,510	10,979	43,642	15,298	98,133
1975 ^{4/}	3,928	8,584	10,742	486	35,233	58,973
1976	14,110	6,090	13,777	31,412	43,659	109,048
1977	19,090	5,519	9,028	202	43,707	77,546
5 year average	11,523	8,051	10,478	15,539	26,223	71,814
Goodnews Bay (Goodnews River) ^{3/}	King	Red	Coho	Pink	Chum	Total
1968			5,485			5,485
1969	3,978	6,256	11,631	298	5,006	27,169
1970	7,163	7,144	6,974	12,183	12,346	45,630
1971	477	330	1,771	0	301	2,879
1972	264	924	925	66	1,331	3,510
1973	3,543	2,072	5,017	324	15,781	26,737
1974	3,302	9,357	21,340	16,373	8,942	59,314
1975 ^{4/}	2,151	8,928	17,127	403	6,459	35,068
1976	4,417	5,575	9,852	8,453	10,354	38,651
1977	3,336	3,723	13,335	29	6,531	26,954
5 year average	2,735	5,371	10,852	5,124	8,573	32,656

1/ Includes subdistricts 335-10, 335-20 and 335-30. Commercial fishing in 335-30 has been prohibited since 1966.

2/ Subdistrict 335-40

3/ Subdistrict 335-50 and includes Chagvan Bay

4/ Final catch data used.

Table 2.. Total utilization of Kuskokwim River king salmon, 1960-1977

Year	Commercial Catch <u>1/</u>	Subsistence Catch <u>2/</u>	Total Utilization
1960	5,969	20,361	26,330
1961	18,918	30,910	49,828
1962	15,341	14,642	29,983
1963	12,016	37,246	49,262
1964	17,149	29,017	46,166
1965	21,989	27,143	49,132
1966	25,545	49,606	75,151
1967	29,986	57,875	87,861
1968	34,278	30,230	64,508
1969	43,997	40,138	84,135
1970	39,290	69,204	108,494
1971	40,274	42,926	83,200
1972	39,454	40,145	79,599
1973	32,838	38,526	71,365
1974	18,664	26,665	45,329
1975	21,720	47,784	69,504
1976	30,735	57,917	88,652
1977	35,830	55,246	91,076
5 yr. average	28,682	42,207	70,889

1/ Subdistricts 335-10, 335-20 and 335-30.

2/ Catches are expanded and include all villages surveyed each year.
Data includes a few villages not included in comparative catch tables.

Table 3. Kuskokwim River commercial effort data, 1965-77 1/

Year	King Season	Chum Season	Coho Season
1965	195		
1966	210		107
1967	233		147
1968	303		242
1969	329		231
1970	361		266
1971	418	216	83
1972	405	176	245
1973	456	341	411
1974	606	467	516
1975	541	539	531
1976	616	517	527
1977	563	522	572

1/ Number of actual fishing vessels.

Table 4. Total utilization of Kuskokwim River chum salmon, 1960-1977

Year	Commercial Catch <u>1/</u>	Subsistence Catch <u>2/</u>	Total Utilization
1960		327,297	327,297
1961		185,447	185,447
1962		165,626	165,626
1963		141,550	141,550
1964		189,660	189,660
1965		283,459	283,459
1966		174,660	174,660
1967	148	205,263	205,411
1968	187	260,023	260,210
1969	7,165	198,628	205,793
1970	1,664	245,550	247,214
1971	68,914	116,391	185,305
1972	78,619	120,316	198,935
1973	148,746	179,259	328,005
1974	171,887	277,170	449,057
1975	181,840	176,389	358,229
1976	177,864	223,792	401,656
1977	248,721	194,197	442,918
5 yr. average	150,591	195,385	345,976

1/ Subdistricts 335-10 and 335-20.

2/ Catches are expanded and include all villages surveyed each year, 335-10, 335-20 and 335-30.

Table 5. Index counts of Kuskokwim River king salmon spawning escapements, 1965-1977 ^{1/}

Year	Aerial Surveys				Counting Tower
	Kisaralik River	Aniak River (Above Salmon R.)	Chukowan River	KogrukluK River	KogrukluK River
1965	194 ^{2/}	-	-	-	-
1966	204 ^{2/}	485	986	1,645	-
1967	-	758 ^{2/}	-	1,033	-
1968	487	783	1,260	2,180	-
1969	-	537	-	-	2,980
1970	531	592	1,118	1,598	3,815
1971	-	144 ^{2/}	-	636 ^{2/}	-
1972	-	93 ^{2/}	163 ^{2/}	476 ^{2/}	1,934
1973	152	200 ^{2/}	229	610 ^{2/}	1,725
1974	4 ^{2/}	15 ^{2/}	43 ^{2/}	-	3,410
1975	129 ^{2/}	145	667	1,062	1,970
1976	873	281	727	518	2,900
1977	-	21 ^{3/}	-	1,342	1,988 ^{4/}

^{1/} ADF&G Annual Management Report, Kuskokwim area, 1977.

^{2/} Surveys rated poor.

^{3/} Survey only uppermost 5 miles of River.

^{4/} Poor counting conditions - probably only a minimum count.

Yukon Area

The Yukon area includes all waters of the Yukon River drainage in Alaska and all waters from Canal Point light southward to Naskonat Peninsula. Commercial salmon fishing is allowed along 1,400 river miles in six subdistricts managed under various regulations (Figure 1).

The 1977 commercial harvest of 931,829 salmon was the third largest in history and exceeded the previous 5-year average of 788,536. Species composition of the 1977 catch was 96,414 kings; 38,021 cohos and 797,381 chums. The coho catch was the largest ever recorded. Table 6 presents annual commercial catches by subdistrict since 1960.

A total of 1,086 commercial, 806 vessel, 647 set gill net and 344 drift gill net licenses was issued for the area in 1977. Also, more than 100 fishwheels (which are legal gear but license fees are not required) were operated. License registration for all types of gear were below the levels recorded in 1976. The decline in license registration is apparently attributed to implementation of the Limited Entry Program. In the lower Yukon area a total of 675 CFEC gillnet permits were issued while in the upper Yukon area 66 gillnet and 161 fishwheel permits were issued.

The 1977 Yukon River commercial king salmon catch was similar to the previous 15-year average of 96,832 fish. Catch and escapement data indicate that the magnitude of the run was above average.

The 1977 commercial chum salmon catch was the third largest in history and exceeded the previous 5-year average by 111,083 fish. The large catch this year was attributed to average to above average runs of both summer and fall chums.

Subsistence utilization of summer chums, which are more abundant than the fall run, has generally decreased in recent years, due to a decline in effort and dependence. In order to encourage greater commercial harvesting of summer chums, regulations have been relaxed. In 1977, a total of 548,959 summer chums was commercially harvested in the Yukon area, mostly in subdistricts 1, 2 and 4 where 98 per cent of the catch was taken. The 1977 catch exceeded the recent 5 year average of 451,526.

A total of 248,422 fall chums was harvested in the Yukon area in 1977. The 1977 commercial catch exceeded the recent five year average of 234,772 fish. Catch and escapement data indicate the run was of average to above average in magnitude.

The Yukon River fall chum fishery has expanded rapidly in recent years. The Department has established a 250,000 optimum fall chum salmon harvest goal until future returns from current harvest levels can be evaluated. Beginning with the 1974 season, the Board established quotas of 200,000 chum salmon for the lower three subdistricts (combined) and 50,000 combined chum and coho salmon for the upper three subdistricts. Public proposals have been submitted to the Board which advocate larger quotas thereby increasing the overall fall chum salmon harvest.

The 1977 commercial coho salmon catch was more than double the previous 5-year average of 16,531 fish. Cohos are generally of minor importance and are taken incidentally to the more abundant fall chum salmon.

Yukon River subsistence catches tabulated to date total 16,800 king and 251,300 other salmon, primarily chums, compared to recent 5 year average of 18,800 king and 236,000 other salmon (Table 7). An additional

2,500 king and 34,300 other salmon were taken for subsistence in the coastal villages of Chevak, Scammon Bay and Hooper Bay during 1977.

King salmon escapements in most index spawning areas varied from average to above average (Table 8). Escapements were considered above average in the lower portion of the drainage and in the Salcha River, but escapements to Yukon Territory streams were considered average at best.

Summer chum escapements were judged good in that portion of drainage downstream of the mouth of the Koyukuk River, but below average elsewhere. Table 9 presents comparable escapement data in various index streams. In the Anvik and Andreafsky River systems, the major summer chum salmon producers, estimated escapements of nearly 450,000 chums were documented. Throughout the Yukon River drainage a total of 560,000 summer chums were documented in selected escapement surveys.

During the past six years the Department has conducted intensive surveys of fall chum and coho salmon spawners in the upper Yukon River drainage (Table 10). In 1977, escapements of fall chums were above average in the Tanana River system. A record 17,900 spawners, more than double any previous year, were observed in the Delta River. Escapement in the Porcupine River system were considered "fair" for a non-peak year.

Tanana River drainage coho salmon escapements as indicated by surveys of the Clearwater Lake, Delta Clearwater and Nenana River systems, were average-above average in magnitude.

Outlook for 1978

Based on parent year catch and escapement information the magnitude of the Yukon River king salmon run in 1978 is expected to be below average to average in magnitude. Summer and fall chum salmon runs in 1978 are expected to be average to above average in magnitude.

Table 6. Commercial salmon catches by species and subdistricts, Yukon district, 1960-1977

Year	KING SALMON								Totals	CHUM SALMON								Totals
	Lower Yukon Area				Upper Yukon Area					Lower Yukon Area				Upper Yukon Area				
	334-10	334-20	334-30	Subtotals	334-40	334-50	334-60	Subtotals		334-10	334-20	334-30	Subtotals	334-40	334-50	334-60	Subtotals	
1960	50,713	15,994	-	66,707	-	-	-	884	67,591	-	-	-	-	-	-	-	-	-
1961	84,463	29,028	4,965	118,456	-	-	-	1,804	120,260	42,577 ^{1/}	-	-	-	-	-	-	-	42,577
1962	67,099	22,224	4,687	94,010	-	-	-	724	94,734	53,160 ^{1/}	-	-	-	-	-	-	-	53,160
1963	85,004	24,211	6,976	116,191	-	-	-	803	116,994	-	-	-	-	-	-	-	-	-
1964	67,555	20,246	4,705	92,506	-	-	-	1,081	93,587	8,347	-	-	-	-	-	-	-	8,347
1965	89,268	23,763	3,204	116,235	-	-	-	1,863	118,098	22,936	-	-	-	-	-	-	-	22,936
1966	70,788	16,927	3,612	91,327	-	-	-	1,988	93,315	69,836	-	1,209	-	-	-	-	-	71,045
1967	104,350	20,289	3,618	128,257	-	-	-	1,449	129,706	46,148	1,425	1,880	-	-	-	-	-	49,453
1968	79,465	21,392	4,543	105,400	-	-	-	1,126	106,526	62,852 ^{1/}	1,407	3,136	-	-	-	-	-	67,395
1969	70,862	14,799	3,577	89,238	-	-	-	985	90,223	184,411	5,024	1,722	-	-	-	-	-	191,157
1970	57,681	17,210	3,712	78,603	-	-	-	1,666	80,269	320,138	22,394	3,285	-	-	-	-	-	346,357
1971	86,042	19,226	3,490	108,758	-	-	-	1,749	110,507	282,461	6,112	50	-	-	-	-	-	288,623
1972	70,052	17,855	3,841	91,748	-	-	-	1,092	92,840	250,945	33,805	1,840	-	-	-	-	-	286,590
1973	55,981	13,859	3,204	74,044	-	-	-	1,309	75,353	395,431 ^{1/}	109,138 ^{1/}	463	-	-	-	-	-	505,032
1974	71,680	17,947	3,471	93,098	685	2,663	1,473	4,821	97,919	641,663	127,644	2,273	771,580	37,079	30,382	40,202	107,663	879,243
1975	44,585	11,187	4,207	59,979	389	2,872	500	3,761	63,740	576,607	150,259	5,590	732,456	178,720	40,209	33,474	252,403	984,859
1976	62,632	17,413	4,239	84,284	385	2,900	1,102	4,387	88,671	382,216	120,959	14,504	517,679	213,019	6,247	24,564	243,830	761,509
1977	69,456	16,781	3,943	90,180	959	4,267	1,008	6,234	96,414	385,972	159,051	19,310	564,333	183,932	26,801	22,595	233,328	797,661
Year	COHO SALMON								Totals	TOTAL SALMON								Totals
	Lower Yukon Area				Upper Yukon Area					Lower Yukon Area				Upper Yukon Area				
	334-10	334-20	334-30	Subtotals	334-40	334-50	334-60	Subtotals		334-10	334-20	334-30	Subtotals	334-40	334-50	334-60	Subtotals	
1960	-	-	-	-	-	-	-	-	-	50,713	15,994	-	66,707	-	-	-	884	67,591
1961	2,855	-	-	2,855	-	-	-	-	2,855	129,895	29,028	4,965	163,888	-	-	-	1,804	165,692
1962	22,926	-	-	22,926	-	-	-	-	22,926	143,185	22,224	4,687	170,096	-	-	-	724	170,820
1963	5,572 ^{1/}	-	-	5,572	-	-	-	-	5,572	90,576	24,211	6,976	121,763	-	-	-	803	122,566
1964	2,446	-	-	2,446	-	-	-	-	2,446	78,348	20,246	4,705	103,299	-	-	-	1,081	104,380
1965	350	-	-	350	-	-	-	-	350	112,554	23,763	3,204	139,521	-	-	-	2,244	141,765
1966	19,254	-	-	19,254	-	-	-	-	19,254	159,878	16,927	3,612	181,626	-	-	-	1,988	183,614
1967	9,925	-	1,122	11,047	-	-	-	-	11,047	160,423	21,714	6,620	188,757	-	-	-	1,449	190,206
1968	13,153	-	150	13,303	-	-	-	-	13,303	155,470	22,799	7,829	186,098	-	-	-	1,126	187,224
1969	14,041	-	845	14,886	-	-	-	95	14,981	269,314	19,823	6,144	295,281	-	-	-	1,783	297,064
1970	12,245	-	-	12,245	-	-	-	-	12,245	390,064	39,604	6,997	436,665	-	-	-	2,573	439,238
1971	12,165	-	-	12,165	-	-	-	38	12,203	380,668	25,338	3,540	409,546	-	-	-	2,848	412,394
1972	21,705	506	-	22,211	-	-	-	22	22,233	342,702	52,166	5,681	400,549	-	-	-	2,368	402,917
1973	34,860	1,781	-	36,641	-	-	-	-	36,641	487,272 ^{1/}	124,778 ^{1/}	3,667	615,717	-	-	-	14,312	630,029
1974	13,728	176	-	13,904	-	509	1,427	2,336	16,240	727,071	145,767	5,774	875,034	37,764	33,954	43,102	116,061	993,402
1975	2,288	-	-	2,288	-	5	53	58	2,346	623,480	161,446	9,797	794,723	179,109	43,086	34,027	256,222	1,050,945
1976	4,084	17	-	4,101	-	-	1,096	1,096	5,197	448,932	138,389	18,743	606,064	213,404	9,147	26,762	249,313	855,377
1977	30,588	5,312	521	36,421	-	-	1,600	1,600	38,021	486,016	181,144	23,774	690,934	184,891	31,068	25,203	241,162	932,096

^{1/} Includes small numbers of pink or red salmon.

Table 7. Yukon River comparative subsistence catch and effort data, 1961-1977 (numbers per fishing family are in parenthesis).

Year	Total Catch		Equivalent Catch ^{1/}		Mean Equivalent Catch per Family ^{1/}	
	King Salmon	Other salmon ^{2/}	King salmon	Other salmon ^{2/}	King salmon	Other salmon ^{2/}
1961	23,719	407,814	23,719	405,632	38	650
1962	19,910	358,441	13,010	329,144	23	583
1963	32,656	421,625	26,141	372,578	44	624
1964	22,817	485,630	19,480	460,712	32	765
1965	19,723	458,379	16,950	436,306	31	806
1966	14,017	214,236	11,507	204,913	23	415
1967	19,661	288,595	16,306	256,926	35	545
1968 ^{3/}	14,832	189,607	11,883	170,522	25	358
1969	14,946	213,725	13,916	195,476	30	426
1970	15,926	223,237	13,474	199,163	34	498
1971	24,755	200,568	21,670	171,247	51	399
1972	19,541	140,102	17,079	119,335	43	298
1973	22,215	186,179	19,458	167,106	42	360
1974	20,543	291,080	16,584	256,636	38	586
1975	17,309	274,236	14,155	250,054	32	568
1976	15,097	221,284	12,449	195,454	24	377
1977	16,755	251,339	15,202	216,467	24	336

Year	Fishing families surveyed ^{1/}	People in fishing families ^{1/}	Snowmachines ^{1/}	Sled dogs ^{1/}	Gear operated ^{1/}	
					Gill nets	Fishwheels
1961	624	3,626 (5.8)		4,806 (7.7)	577	169
1962	564	3,279 (5.8)		3,848 (6.8)	613	138
1963	597	3,460 (6.9)		4,155 (7.0)	716	156
1964	602	3,524 (6.0)		4,003 (6.6)	840	155
1965	541	3,453 (7.3)		3,974 (7.3)	647	127
1966	494	3,144 (6.4)		3,112 (6.3)	578	116
1967	471	2,756 (5.9)	192 (0.4)	2,752 (5.8)	530	87
1968	476	3,109 (6.5)	262 (0.6)	2,719 (5.7)	565	71
1969	459	2,974 (6.5)	349 (0.8)	2,442 (5.3)	594	63
1970	400	2,679 (6.7)	346 (0.9)	2,214 (5.5)	647	55
1971	429	2,795 (6.5)	414 (1.0)	1,894 (4.4)	683	56
1972	401	2,508 (6.3)	423 (1.1)	1,375 (3.4)	698	57
1973	463	2,894 (6.3)	485 (1.0)	2,030 (4.4)	840	77
1974	438	2,759 (6.3)	492 (1.1)	1,796 (4.1)	609	83
1975	440	2,772 (6.3)	539 (1.2)	1,932 (4.4)	834	88
1976	518	3,257 (6.3)	660 (1.3)	2,528 (4.9)	846	119
1977	645	4,064 (6.3)	750 (1.2)	2,717 (4.2)	711	122

^{1/} Data from villages surveyed each year since 1961: Mouth to Fort Yukon and Tanana River (does not include Fairbanks area).

^{2/} Mostly chum salmon, some pinks and cohos.

^{3/} Total king and other salmon catches have been corrected.

Table 8. Comparative Yukon River drainage king salmon escapement counts 1959-1977. ^{1/}

Year	Andreafsky River (East fork)	Andreafsky River (West fork)	Anvik River
1960	1,020	1,220	1,950
1961	1,003		1,226
1962	675 ^{2/}	762 ^{2/}	
1963			
1964	867	705	
1965		355 ^{2/}	650 ^{2/}
1966	361	303	638
1967		276 ^{2/}	336 ^{2/}
1968	380	383	297 ^{2/}
1969	231 ^{2/}	274 ^{2/}	296 ^{2/}
1970	665	574 ^{2/}	368 ^{2/}
1971	1,904	1,284	
1972	798	582 ^{2/}	1,172 ^{4/}
1973	825	788	613 ^{4/}
1974		285	506 ^{5/}
1975	993	421	720 ^{6/}
1976	818	643	1,155 ^{6/}
1977	2,008	1,499	1,354 ^{6/}
Year	Salcha River	Nisutlin River (Sidney-100 Mile Cr.)	Whitehorse Dam Fishway
1959			1,054
1960	1,660		660
1961	2,878		1,068
1962	937		1,500
1963			484
1964	450		587
1965	408		903
1966	800		563
1967			533
1968	735	407	407
1969	461 ^{2/}	105	334
1970	1,882	615	625
1971	159 ^{2/}	640 ^{3/}	856
1972	1,193	317	392
1973	249	36 ^{2/}	228
1974	1,857	48 ^{2/}	273
1975	1,055	249	313
1976	1,550	102	120
1977	1,200	77	277

- ^{1/} With exception of Whitehorse fishway counts, the data was obtained from aerial surveys which were made only of the main stem of each river listed.
- ^{2/} Incomplete survey or poor survey conditions resulting in a very minimal count.
- ^{3/} Environment Canada - Fisheries Service survey.
- ^{4/} Combination tower counts & aerial survey estimates.
- ^{5/} Tower count.

Table 9. Comparative Yukon River drainage summer chum salmon aerial survey escapement estimates, 1958-1977.

Year	SUMMER CHUMS			
	Andreafsky River (East Fork)	Andreafsky River (West Fork)	Anvik River	Salcha River
1958			100-200,000	
1959			200,000	
1960	3,830		11,110	670
1961	8,110			1,152
1962	18,040	19,530	20,600	1,161
1963				
1964		12,810	12-14,000 ^{1/}	250 ^{1/}
1965		14,670 ^{1/}	100,000	2,375
1966	25,619	18,145	37,500	2,200
1967		14,495 ^{2/}	116,000	
1968	17,600 ^{2/}	74,600 ^{2/}	51,580 ^{1/}	3,790
1969	119,000	159,500		425 ^{1/}
1970	84,090	91,710 ^{1/}	232,780	7,879
1971	98,095	71,745		306 ^{1/}
1972	41,460	25,573	245,857 ^{3/}	947 ^{1/}
1973	10,149 ^{1/}	51,835	86,665 ^{3/}	290
1974	3,215 ^{1/}	33,258	201,277 ^{4/}	8,040 ^{5/}
1975	223,485	235,954	845,485	7,573
1976	105,347	118,420	406,166 ^{3/}	6,474
1977	112,722	63,120	269,004 ^{3/}	677

- ^{1/} Poor or incomplete survey.
- ^{2/} Includes some pinks.
- ^{3/} Combined tower and aerial survey estimates.
- ^{4/} Tower counts.
- ^{5/} Combined aerial and boat surveys.

Table 10. Comparative Yukon River drainage fall chum salmon aerial survey escapement estimates, 1971-1977 ^{1/}

	1971	1972	1973	1974	1975	1976	1977
<u>Tanana River drainage</u>							
Bear Paw River	--	--	1,530	2,996	1,657	--	--
<u>Toklat River drainage</u>							
Upper Toklat River ^{3/}	--	1,000 ^{2/}	6,957	34,310	42,418	35,224 ^{2/}	25,000
Lower Toklat River	--	--	--	--	35,867	2,000 ^{2/}	-
					<u>78,285</u>	<u>37,224</u>	<u>25,000</u>
Benchmark #735 Slough	--	5,255	127 ^{2/}	1,450	--	336	1,270
Delta River	--	3,650	7,971	4,010	3,946 ^{7/}	5,520	17,925
Upper Tanana River ^{4/}	--	8,350	5,635	4,567	--	4,979	3,797
Bluff Cabin Slough	--	6,040	3,450	4,840	5,000 ^{2/}	3,197	6,491
Delta Clearwater Slough (1 Mile Slough)	--	--	1,720	1,235	745 ^{2/}	1,552	1,900
<u>Chandalar River</u>	--	--	--	17,455	6,345 ^{2/}	58 ^{2/}	4,183
<u>Porcupine River drainage</u>							
Sheenjok River	--	--	1,175	40,507	78,060	12,023	20,506
Fishing Branch River (Yukon Territory)	250-300,000	35,125 ^{5/}	15,987 ^{6/}	32,525 ^{6/}	353,282 ^{6/}	13,450	32,500

1/ All surveys rated fair-good unless rated otherwise. Only peak estimates listed.

2/ Poor or incomplete survey; very minimal and/or rough estimate.

3/ Includes following areas: Toklat River in vicinity of roadhouse, Shushana River and Geiger Creek.

4/ Richardson Highway Bridge to Blue Creek.

5/ Combined tagging population estimate and weir count.

6/ Weir count.

7/ Foot survey.

Norton Sound Area

A total of 259 commercial, 178 vessel and 173 gear licenses were issued in 1977. This represents decreases of 25, 41 and 41 percent from record 1975 levels for commercial and gear licenses, respectively. A total of 199 CFEC gillnet permits were issued in 1977.

The commercial salmon harvest of 259,800 fish was the second largest on record and included 4,400 king, 3,600 coho, 49,400 pink and 202,200 chum salmon. The king and chum salmon harvest was the second largest ever documented.

Norton Sound subsistence fishing effort apparently increased in several subdistricts. This may have been due to the strong chum salmon returns; however, many catches were made late in the season, due to the low water conditions and the availability of fire fighting jobs during the normal fishing period.

Tundra and forest fires on the Seward Peninsula hampered initial aerial survey operations in several subdistricts. Subsequent rainfall quelled the fires and eliminated the heavy smoke conditions that had earlier prevailed; however, resultant cloud cover and turbid water conditions continued to curtail aerial survey efforts in some subdistricts. Comparative commercial and subsistence catch data, counting tower results and successful aerial surveys indicated chum salmon escapements were average in subdistricts 3, 4, 5 and 6, below average in subdistrict 2 and above average in subdistrict 1. Overall, pink salmon escapements were average to above average, while king salmon escapements were above average.

Comparative commercial and subsistence catch data is presented in Table 11 while escapement information is presented in Table 12.

Outlook for 1978

Based on limited parent year escapement data chum salmon returns in general to Norton Sound are expected to be average at best in 1978. Norton Sound pink salmon do not show a strong odd/even year cycle, however parent year escapements in 1976 were average which may indicate similar returns in 1978.

Table 11. Commercial and subsistence salmon catches, Norton Sound district, 1961-1977.

Year	Commercial ^{1/}					Subsistence					Combined				
	King	Coho	Pink	Chum	TOTAL	King	Coho	Pink	Chum	TOTAL	King	Coho	Pink	Chum	TOTAL
1961	5,300	13,807	34,237	48,332	101,676						5,300	13,807	34,237	48,332	101,676
1962	7,286	9,156	33,187	182,784	232,413						7,286	9,156	33,187	182,784	232,413
1963	6,613	16,765	55,675	154,789	233,792	5	118	16,607	17,635	34,365	6,618	16,883	72,232	172,424	268,157
1964	2,018	98	13,567	148,862	164,545	565	2,567	9,225	12,486	24,843	2,583	2,665	22,792	161,348	189,388
1965	1,449	2,030	220	36,795	40,494	574	4,812	19,131	30,772	55,289	2,023	6,842	19,351	67,567	95,783
1966	1,553	5,755	12,778	80,245	100,331	269	2,210	14,335	21,873	38,687	1,822	7,965	27,113	102,118	139,018
1967	1,804	2,379	28,879	41,756	74,818	817	1,222	17,516	22,724	42,279	2,621	3,601	46,395	64,480	117,097
1968	1,045	6,885	71,179	45,390	124,499	237	2,391	36,912	11,661	41,201	1,282	9,276	108,091	57,051	175,700
1969	2,392	6,836	86,949	82,795	178,972	436	2,191	18,562	15,615	36,804	2,828	9,027	105,511	98,410	215,776
1970	1,853	4,423	64,908	107,034	178,218	561	4,675	26,127	22,703	54,126	2,419	9,098	91,035	129,797	232,374
1971	2,593	3,127	4,895	131,362	141,977	1,026	4,097	10,863	21,815	37,801	3,619	7,224	15,758	153,177	179,778
1972	2,938	454	45,182	100,920	149,494	804	2,319	14,158	13,966	31,247	3,742	2,773	59,340	114,886	180,741
1973	1,918	9,282	46,499	119,098	176,797	392	520	14,770	7,185	22,867	2,310	9,802	61,269	126,283	199,664
1974	2,951	2,092	148,519	162,267	315,829	420	1,054	16,426	3,958	21,868	3,371	3,156	164,945	166,225	337,697
1975	2,393	4,593	32,388	212,485	251,861	186	192	15,803	8,124	24,305	2,579	4,785	48,191	220,609	276,166
1976	2,219	6,916	87,892	96,250	193,277	203	1,004	18,048	7,718	26,973	2,422	7,920	105,940	103,968	220,250
1977	4,413	3,574	49,361	202,164	259,782	846	2,530	14,296	26,607	44,279	2,529	6,104	63,657	228,771	304,661
5-Yr. Avg.	2,483	4,667	72,096	138,204	217,451	401	1,017	15,841	8,190	25,452	2,884	5,687	87,937	146,394	242,903
10-Yr. Avg.	2,210	4,699	61,729	109,935	178,574	508	1,966	23,918	11,275	34,947	2,718	7,462	80,647	123,488	213,524

^{1/} Small number of reds taken, but not included in totals.

Table 12. Comparative aerial surveys of Norton Sound streams, 1961-1977.

YEAR	CHUM	PINK	PINK AND CHUM ^{1/}
<u>Nome (Subdistrict 1)</u>			
<u>NOME RIVER</u>			
1960		410	
1963	126	3,719	
1964			480
1965	294		
1971	75	7,755	
1973	710	14,960	
1974	854	17,830	
1975	975	3,405	
1976	1,200	6,700	
1977	3,046	1,726	
<u>Golovin (Subdistrict 2)</u>			
<u>NIUKLUK RIVER</u>			
1962			27,879
1964	13,687	4,103	
1966	21,300	8,600	4,700
1967	20,546		
1968			85,125
1969	10,240	92,650	
1970	7,300	60,300	
1971	22,605	8,370	
1972	10,500	22,600	
1973	15,156	14,326	
1974	8,720	8,915	
1975	16,453	10,089	
1976	4,134	7,190	
1977	10,456	1,921	
<u>Moses Pt. (Subdistrict 3)</u>			
<u>KWINIUK RIVER</u>			
1965	26,634	8,301	
1966	32,786	10,629	
1967	24,444	3,508	
1968	18,813	126,764	
1969	19,687	56,683	
1970	68,004	235,135	
1971	38,679	16,634	
1972	30,686	62,461	
1973	28,617	38,426	
1974	35,899	40,816	
1975	14,344	57,317	
1976	6,466	28,087	
1977	22,757	46,234	

Table 12.(cont) Comparative aerial surveys of Norton Sound streams 1961-1977.

YEAR	CHUM	PINK	PINK AND CHUM ^{1/}
<u>Shaktoolik(Subdistrict 5)</u>			
<u>SHAKTOOLIK RIVER</u>			
1961			10,300
1962			36,417
1963			29,987
1964			16,327
1966			4,060
1975	16,601	37,971	
1976	1,736	12,175	
1977	20,899	7,602	
<u>Unalakleet(Subdistrict 6)</u>			
<u>UNALAKLEET RIVER</u>			
1961			50,260
1962			46,838
1963			19,305
1964			28,214
1966			5,200
1968			112,812
1970	950	95,075	
1972	7,852	12,450	
1975	10,501	16,750	
1976			38,325
1977	16,038	18,170	

^{1/} Not distinguished by species.

Kotzebue Area

A total of 522 commercial, 222 vessel and 218 gear licenses were issued in 1977. This represents slight decreases in commercial and gear license registration from record 1975 levels, while vessel licenses exhibited a slight increase. A total of 228 CFEC gillnet permits were issued in 1977.

The commercial chum salmon harvest of 195,900 fish was the fourth largest on record, exceeded only by catches made during 1973-1975. This season's catch was 22 percent above the 1976 harvest of 159,800 chum salmon.

Subsistence surveys indicated below average salmon catches and effort this season. Many people apparently worked on fire fighting crews rather than fishing for subsistence.

Extensive tundra fires occurred throughout the northern Seward Peninsula, eastern Kotzebue Sound area, and the Kobuk/Noatak River valleys. Smoke from these fires precluded assessment of chum salmon escapements to the Kobuk and Noatak Rivers via aerial survey methods. Heavy rainfall subdued the fires, but resulted in extensive run-off and turbid water conditions. Comparative commercial catch data, test fishing data from the Noatak River and limited aerial surveys indicated 1977 returns and escapements were below recent year averages. Comparative commercial and subsistence catch data is presented in Table 13.

Outlook for 1978

Chum salmon escapements of the 1974 brood year to the Noatak and Kobuk Rivers were excellent. The return in 1978 may therefore be above average. It should be noted however, that Kotzebue chum salmon stocks inhabit the northernmost part of the range for this species and may be subject to large fluctuations in returns.

Table 13. Commercial and subsistence salmon catches, Kotzebue district, 1914-1977.

Year ^{1/}	Commercial catch			Subsistence Chum	Combined Catches
	Chum	Other ^{3/}	Total		
1914	8,550		8,550		
1915	4,750		4,750		
1916	19,000		19,000		
1917	44,612		44,612		
1918	27,407		27,407		
1957 ^{4/}				298,430	
1962	129,948	127	130,075	20,283	200,358
1963	54,445	143	54,588	31,069	85,657
1964	76,499	5	76,504	29,762	106,266
1965	40,034		40,034	30,500	70,534
1966	30,764	1	30,765	35,588	66,353
1967	29,400		29,400	40,108	69,508
1968	30,384 ^{5/}		30,384	20,814	51,198
1969	59,335	48	59,383	29,812	89,195
1970	159,664		159,664	28,486	188,150
1971	154,956	1	154,957	23,959	178,916
1972	169,664	3	169,667	11,085	180,752
1973	375,432	5	375,437	18,942	394,379
1974	634,479 ^{6/}	48	634,527	26,729	661,256
1975	563,682 ^{7/}	36	563,718	27,605	591,323
1976	159,796	2	159,798	15,765	175,563
1977 ^{8/}	195,895		195,895	5,000	200,895

1/ There was no commercial fishing during 1919-1961.

2/ Catches for 1914-1918 from pack data only; numbers of chums estimated at 9.5 per case (48#) and 34 per barrel.

3/ Mostly pinks, but includes king salmon and roe salmon.

4/ Estimated mean annual catches prior to 1957 (study by Raleigh).

5/ Corrected from 1963 annual report due to addition of late catches.

6/ Includes 6,567 chum salmon harvested from Deering experimental fishery.

7/ Includes 10,704 chum salmon harvested from Deering experimental fishery.

8/ Preliminary totals.