INFORMATIONAL LEAFLET NO. 212

ALASKA CHINOOK SALMON (Oncorhynchus tshawytscha Walbaum)
CATCH AND ESCAPEMENT, 1961-1980, WITH AGE, SIZE,
AND SEX COMPOSITION ESTIMATES

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April 1983

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ABSTRACT

Abundance, age, sex, and size data is summarized for Alaskan chinook salmon *(Oncorhynchus tshawytscha* Walbaum*)* catches and escapements for the years 1961 through 1980. These data are presented by area and fishery. Most of the chinook harvested in Alaskan waters are commercially caught with the largest harvests occurring in Southeastern Alaska, the Yukon River, Bristol Bay, and the Kuskokwim River. The Kuskokwim River supports the largest chinook subsistence fishery followed by the Yukon River and Bristol Bay. The State's major sport fisheries are centered in Southeastern Alaska and Cook Inlet. The actual magnitude of most chinook spawning populations is not known although abundance is generally indexed by aerial surveillance. The largest single river spawning escapements are found in the Yukon, Kuskokwim, Nushagak, and Susitna Rivers. Age, size, and sex sampling of chinook catches and escapements has not been consistent. For most chinook systems, 4-ocean fish are the most common age class followed by 3-ocean fish. A larger proportion of 2-ocean fish were observed in most escapement samples than were found in the corresponding catch samples.

INTRODUCTION

The chinook salmon *(Oncorhynchus tschawytscha* Walbaum*)*, also known as king salmon locally, is important to many Alaskan commercial, subsistence, and sport salmon fisheries. The Alaska Department of Fish and Game (ADF&G) with direction from the Alaska Board of Fisheries and in collaboration with the North Pacific Fishery Management Council and concerned Federal agencies, attempts to manage Alaskan chinook salmon fisheries to assure maximum sustained yield. To realize this objective, ADF&G and other resource agencies collect biological data and formulate management plans for individual stocks, fisheries, or geographical areas within specific management regimes. Recently, management of chinook salmon taken in Alaska has come under increasing scrutiny. The State allocates chinook salmon to commercial, subsistence, and sport interests. Also, international and interstate allocation of chinook salmon available to those who fish in Alaska has become a major issue. To resolve the problems in a rational and equitable manner, it is first necessary to compile a current statewide data base of fundamental biological parameters for chinook salmon taken or spawning in Alaska.

The objective of this report is to present abundance, age, sex, and size data for Alaskan chinook salmon catches and escapements for the years 1961 through 1980. These data are summaries of available information on the magnitude and composition of Alaskan chinook salmon catches and escapements. No attempt has been made by the editors to enhance existing data. However, we have attempted to organize the information to clearly present current knowledge of the magnitude, age, sex, and size composition of chinook salmon spawning or harvested in Alaskan waters. The format employed is intended to facilitate discussions of research program direction and fishery management objectives.

METHODS

Study Area Description

The study area consisted of all Alaskan inland and coastal waters. Certain data from Canadian portion of the Stikine, Yukon, Alsek, and Taku River drainages have also been included. Data presented are grouped by geographical area: Southeastern Alaska, the Cordova area, Cook Inlet, Bristol Bay, the Westward Region (Kodiak Island and the Alaska Peninsula), the Kuskokwim area, the Yukon area, and Norton Sound. Included for each geographical area are catch estimates by user group (commercial, subsistence, and sport); estimates of escapement; age, sex, and size composition of catch samples; and, when available, estimates of the age, sex, and size composition of escapements.

Abundance

Commercial catches are reported here by Division of Commercial Fisheries management districts. This information was largely obtained from ADF&G Division of Commercial Fisheries area annual management reports. These catch estimates include both preliminary and final summations of individual landings, in number

of fish. Catch data were also obtained from Alaska Salmon Catches (1981), ADF&G Computer Services, and International North Pacific Fisheries Commission (INPFC) documents. Subsistence catches were obtained almost exclusively from ADF&G Division of Commercial Fisheries annual area management reports. This information is a combination of estimates derived from permits (harvest tickets) and informal estimates by ADF&G area staff. Sport catch estimates since 1977 were obtained from ADF&G Division of Sport Fish statewide harvest summaries. These estimates are reported by area and are derived from mail questionnaires. Sport catch estimates prior to 1977 were made from creel census samples and were obtained from ADF&G Sport Fish Division Federal Aid reports.

Escapements are reported by river drainage and sometimes location within each area. Virtually all Alaskan escapement information was obtained from ADF&G aerial surveys. Most of these estimates are reported as peak counts of numbers of fish observed in each tributary surveyed and, as such, may be lower than the total escapement. Total escapement estimates, derived from aerial survey data, are reported for selected river drainages in Cook Inlet, Bristol Bay, and the Westward Region. Escapement estimates were also obtained from weir, tower, fishway, ground survey, tagging, and sonar reports.

Age, Sex, and Size

Most of the age, sex, and size information was obtained from those commercial and sport catches sampled by ADF&G staff. Most of these data are simple sample summaries and have not been weighted by the actual catches from which they were taken. Only limited data were available from major chinook salmon escapements. Methodology for sample collection was variable. The European notation is used to identify age classes: the number of freshwater annuli appears first, separated by a decimal point from the number of saltwater annuli. The actual age is the sum of the two numbers plus one year. Age determinations derived from methods other than scale analysis are footnoted unless otherwise stated, lengths are from the middle of the eye to the fork of the tail. Fish weights were obtained only from commercial catches.

SOUTHEASTERN ALASKA

The Southeastern Alaska region, including Yakutat, includes coastal waters and inland drainages from Dixon Entrance southeast of Ketchikan to Cape Suckling above Yakutat (Figures 1 and 2). The region is divided into sixteen coastal districts (101 through 116), 5 offshore districts (150, 152, 154, 157, and 189), and 9 Yakutat districts (181 through 186, 189, 191, and 192). These districts are grouped roughly into management areas near Ketchikan, Petersburg, Sitka, and Juneau (which usually includes Yakutat). Several statistical area revisions make direct comparisons of some years and some districts difficult.

Historically, the largest catches of chinook salmon in the State have occurred in Southeastern Alaska. Coded wire tag recoveries demonstrate that a significant proportion of the Southeastern Alaska chinook harvest originates in British Columbia, Washington, and Oregon. Native Southeastern Alaska chinook stocks spawn in the larger coastal rivers and their tributaries. Most of these stocks

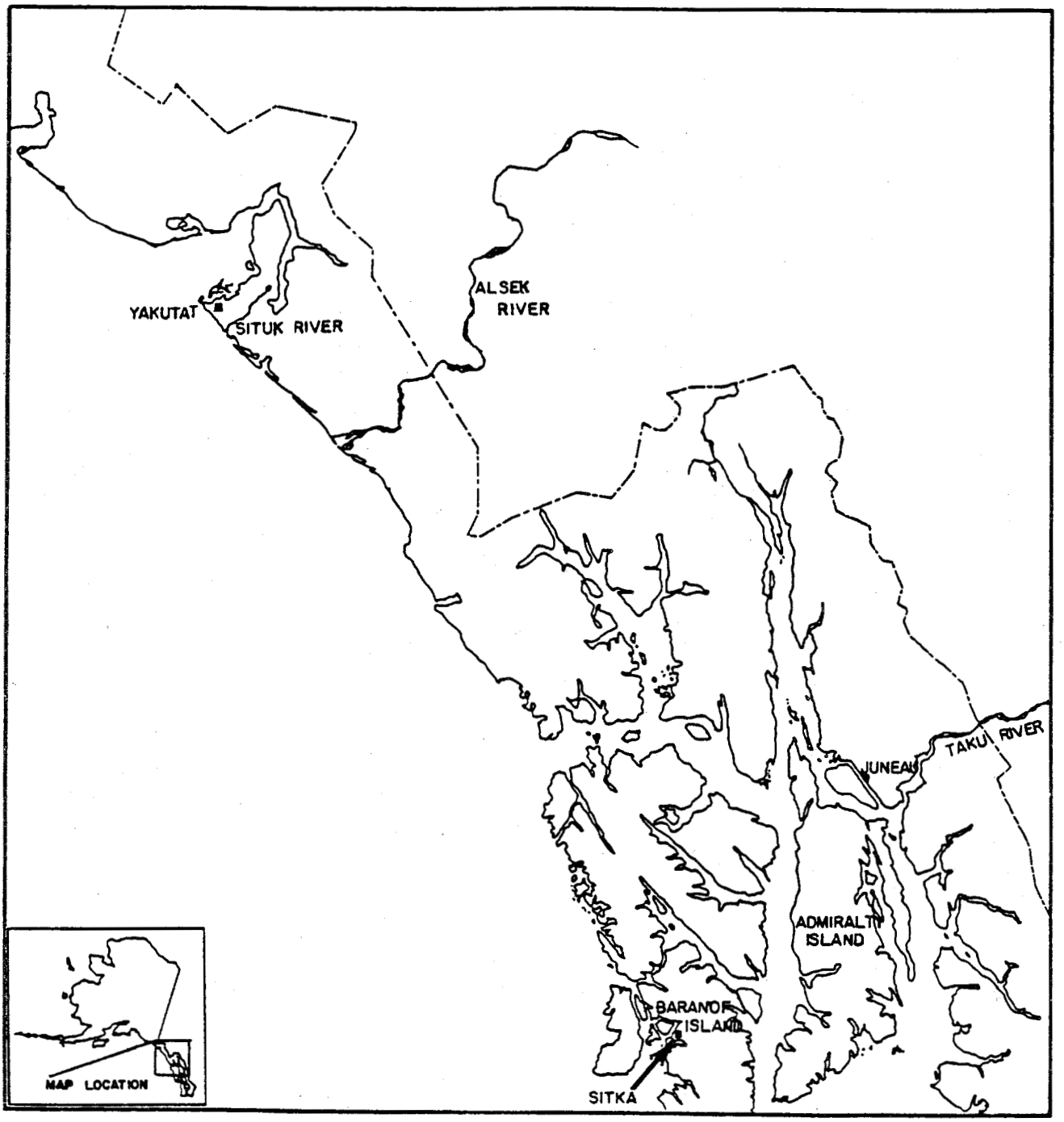

Figure 1. Northern Southeastern Alaska.

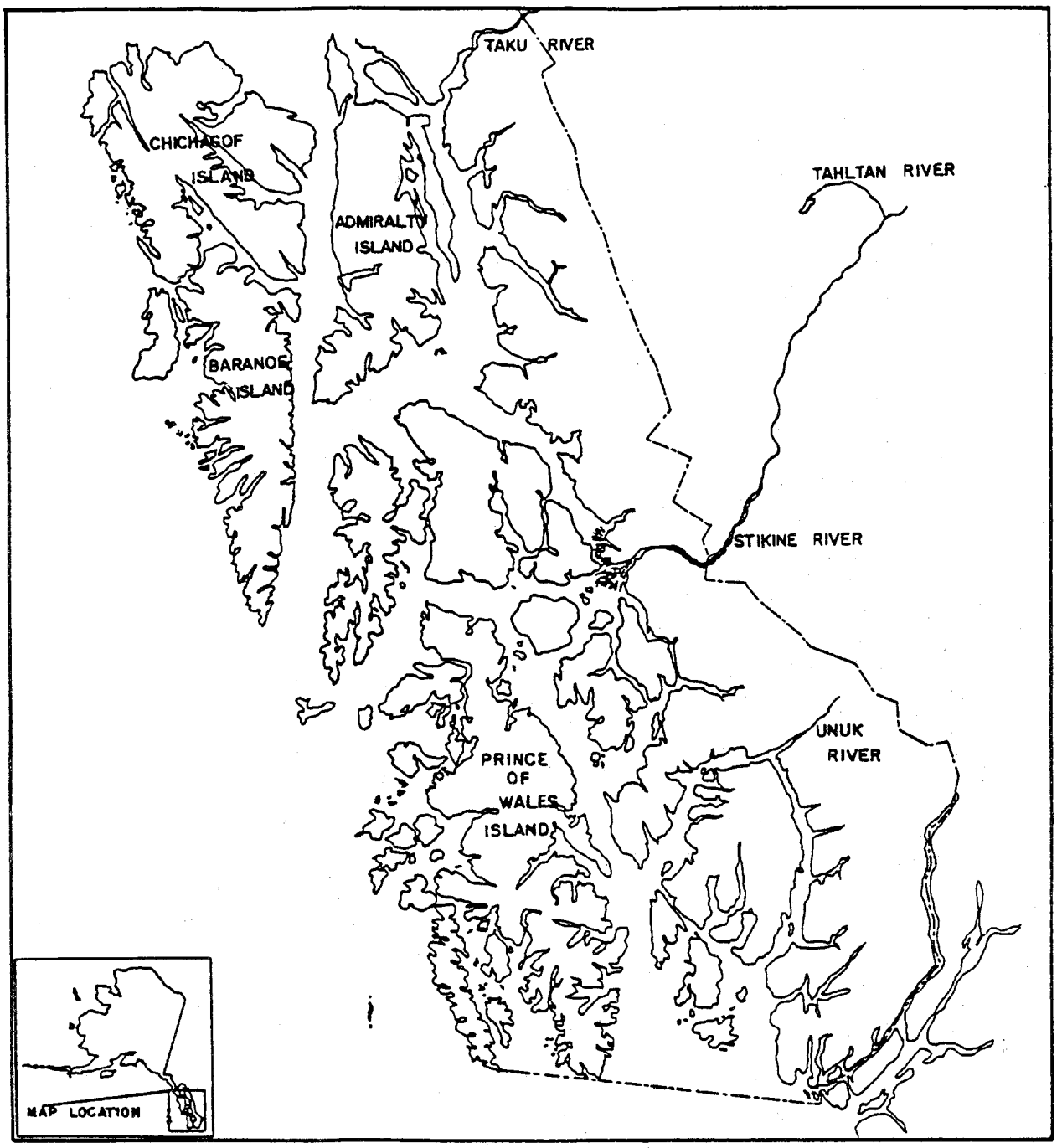

Figure 2. Central and Southern Southeastern Alaska.

have been seriously depleted, probably by continued overexploitation. The Taku, Stikine, and Alsek Rivers are the most important chinook salmon producers. The region also supports marine sport fisheries, primarily near urban areas. Subsistence fisheries are minimal or nonexistent in all areas except Yakutat and upper Lynn Canal.

Chinook salmon are a primary target for the Southeastern Alaska troll fishing fleet but are only incidental catches in seine and gillnet fisheries. Catches over the last two decades have been fairly stable at about 320,000 fish annually, but these harvests are only half the historical peak reached during the 1930's. This decline is commonly ascribed to the combined effects of overexploitation throughout the range of the fish and of environmental degradation in British Columbia, Oregon, Washington, and California. Hatchery production in these other states and Canada has offset the declines somewhat and has probably helped to stabilize catches during the last 20 years. On the other hand, the continued high exploitation rate supported by this artificial production may have contributed to the decline in native Southeastern Alaska stocks.

By the late 1960's, it had become apparent that Southeastern Alaska chinook salmon stocks had seriously declined from historical levels. Beginning in the early 1970's, fishing regulatory measures aimed at rebuilding Southeastern Alaska chinook stocks were established. In 1980, the Alaska Board of Fisheries inaugurated a 15-year program to strengthen and reestablish local chinook stocks.

In the early 1970's, spring net and troll fisheries in terminal areas were restricted to reduce the take of mature chinook spawners. By 1975 all terminal net fisheries targeted on chinook salmon had been eliminated. During the next 5 years, more restrictions on terminal troll chinook fisheries were implemented, and in 1978 the minimum legal size for troll-caught chinook was increased to 28 inches (snout to tail) to protect immature fish. In 1979 a guideline harvest range of 286,000 to 320,000 chinook for all commercial gear types was established in Southeastern Alaska. The range was reduced from 272,000 to 286,000 fish in 1980. Troll closures were adopted during peak chinook spawning migration periods. These measures have acted to conserve both local and distant chinook stocks, and are initial steps toward an integrated coastwide management regime for chinook salmon, which is believed essential to the maintenance of healthy Southeastern Alaska chinook fisheries.

The Sitka management area (Districts 113 and 157) has consistently provided the largest portion of the chinook commercial catch (1975-1979 average 116,000 fish) in the region (Tables 1 and 4). Almost all of the chinook harvest in this area is by troll gear.

The Ketchikan area, consisting of inside and outside water east and west of Prince of Wales Island, produces the second largest harvest in the region, averaging 89,000 fish in 1975-1979 (Tables 2 and 3). Net and trap chinook salmon catches in the Ketchikan area (Districts 101 through 104) have averaged approximately 16,000 fish since 1961 and are taken mostly by purse seine with somewhat smaller catches made by gillnet (Table 5).

The outer coastal areas of Yakutat and the Fairweather Grounds (Districts 116, 157, 181 through 186, 189, 191, and 192) comprise the next most productive area

in the region. Most of the net harvest of about 3,000 fish annually is taken by set gill net in terminal areas at the various river mouths. The total harvest for the area averaged 56,000 chinook from 1975 through 1979 (Tables 1, 4, and 5). Yakutat and the Fairweather Grounds are usually considered part of the Juneau management area.

Chinook harvests in the Petersburg management area (Districts 106 through 110) averaged 31,000 fish for the period 1975-1979 (Table 2), a decline from the historic average of 45,000 (1963-1979). Increasingly restrictive regulations imposed in the area have reduced recent drift net catches (1975-1979 average 3,200 fish) to levels somewhat below previous means (1970-1979 average 6,700 fish, see Table 5). About 90% of the commercial harvest is taken by troll gear.

The Juneau area (Districts 111, 112, 114, and 115) has also produced fewer net-caught chinook salmon recently because of restrictions in the Taku drift net fisheries (Table 5). The 1975-1979 average net catch of 3,800 fish was less than half the 7,000 fish average for the period 1970-1979. The overall harvest for all gear types averaged 28,000 fish for the Juneau area (Table 1).

Accurate region-wide estimates of sport catches are not available for years prior to 1977, when mail-in questionnaires were introduced. These indicate an annual average catch of approximately 17,000 fish for the entire Southeastern region (Table 6). The Juneau and Ketchikan areas are the two largest producers with average catches of 6,300 and 4,500 fish, respectively (1977-1979).

The Yakutat subsistence fishery, mostly on the Situk River, is generally believed to harvest several hundred fish per year. Subsistence fisheries operating on Canadian tributaries of the Alsek, Stikine, and Taku Rivers also harvest up to several thousand fish per year.

Escapement surveys of chinook salmon in Southeastern Alaska are usually planned to coincide with peak spawning periods, although incidental observations in conjunction with surveys for other salmon species are included (Tables 7-9). With the exception of the King Salmon River on Admiralty Island, spawning is confined to coastal rivers on the mainland. The largest of these are the Taku, Stikine, and Alsek, which are believed to have escapements of over 10,000 fish (Tables 7 and 8). Rivers with moderate production (500 to 5,000 fish) are the Keta, Chickamin, Unuk, Harding, Chilkat, Situk, Bradfield, and Wilson-Blossom Rivers (Table 9). In addition, there are more than twenty minor producers receiving up to several hundred fish each year. Artificial production by the 6 State, 1 Bureau of Indian Affairs, and 7 private non-profit hatcheries is presently less than 10% of the total design capacity of 90,000 fish. Habitat degradation by various land uses is currently minimal in Alaska in comparison with areas to the south. However, this may change radically in the future as development proceeds.

Age compositions of chinook taken in Southeastern Alaska fisheries have been sampled only sporadically and sample sizes were usually small (Tables 11 through 15). Also, since virtually all Alaskan chinook stocks rear in fresh water for only one winter, fresh water ages were often not reported. Scales taken from carcasses at the Nakina River weir illustrate the presence of weak year classes, particularly from the 1973 brood year (Table 15).

More than 343,000 chinook salmon were harvested in Southeastern Alaska in 1980. Commercial harvests of chinook by all gear types totaled 323,000 fish, near the recent 5, 10, and 19-year averages of 319,000; 325,000, and 318,000 fish, respectively (Table 1). More than 90% of the catch was taken by the troll fishery and the 301,000 fish troll harvest was virtually identical to the recent five and ten-year averages (Table 4). The total 1980 catch by other commercial gear types amounted to 21,000 fish and was also similar to recent averages (Table 5).

Troll catches in the Ketchikan area were the third lowest since 1963 with 59,000 fish landed, well below the recent 5 and 10-year averages of 81,000 and 89,000 fish, respectively. The net catch of 14,000 fish, on the other hand, was well above the recent average (1975-1979) of 8,100. The overall commercial catch (all gear types) was 73,000 fish.

Petersburg area troll catches (35,000 fish) were slightly above the averages for 1975-1979 and 1970-1979 (28,000 and 32,000 fish, respectively). At the same time, catches in the Prince of Wales and Stikine drift net fisheries (1,200 fish) were well below recent averages. The total area harvest was 36,000 fish and was above the recent 5-year average (31,000 fish) but below the recent 10 and 19-year harvests (39,000 and 45,000 fish, respectively).

The chinook harvest in the Sitka area (137,000 fish) was higher than average (116,000 fish for 1975-1979) for the third consecutive year, but was well below the 20-year record high of 196,000 fish set in 1978. The net catch was less than 400 fish.

The total 1980 commercial harvest in the Juneau area was 26,000 fish, slightly under the recent 5-year average (28,000 fish), but well below the recent 10-year average (36,000 fish). Troll catches were 85% of the total.

The 1980 troll harvest from the Fairweather Grounds and Yakutat comprised 94% of the total catch (51,000 fish). This catch was below both the recent 5 and 10-year averages 56,000 and 62,000 fish, respectively). The Yakutat set net catch of 28,000 fish was similar to the recent 5, 10, and 19-year averages of 2,800, 2,500, and 2,200 fish, respectively.

The Southeastern Alaska sport fishery harvested an estimated 20,200 chinook salmon, well above the 1977-1979 average of 17,000 fish (Table 6).

Record escapements of chinook salmon were observed in the Taku (7,600 fish) and Stikine (6,300 fish) Rivers in 1980. Escapements to all other Southeastern streams were average or below (Tables 7, 8, and 9).

Table 1. Northern and total Southeastern Alaska commercial chinook salmon catches by district and year and selected period averages, 1961-1980.

Number of Fish

	Sitka Area			Juneau Area					Yakutat and Fairweather Grounds										
Year	Coastal 113	Offshore 154	Total	Taku 111	Chatham Strait 112	Lynn Canal 115	Icy Strait 114	Total	Fair-weather Grounds 116	Offshore 157	181	Yakutat 182	183	Offshore 189	Other 1/	Total	Northern Districts Total	Southern Districts Total	Southeast Region Total
1961																			229,588
1962																			205,561
1963	40,049		40,049	22,308	12,495	2,350	69,694 2/	106,847				687	255			942	147,838	110,643	258,482
1964	69,097		69,097	17,082	21,718	3,586	93,610 2/	135,996				1,373	632			2,005	207,098	150,093	357,191
1965	38,120		38,120	21,615	14,325	4,698	85,450 2/	126,088				1,235	233			1,468	165,676	121,557	287,233
1966	68,202		68,202	22,306	11,824	2,687	62,061 2/	98,878				1,513	639			2,152	169,232	138,912	308,144
1967	24,971		24,971	14,905	8,382	3,473	105,181 2/	131,941			77	501	1,612			2,190	159,102	141,885	300,987
1968	48,899		48,899	16,345	7,748	3,279	112,020 2/	139,392			42	666	3,093			3,801	192,092	139,522	331,614
1969	61,275		61,275	17,618	2,870	3,716	39,015	63,219	65,205		190	3,157	1,331			69,883	194,377	119,522	313,899
1970	85,782		85,782	11,916	4,006	3,889	19,945	39,756	30,486	18,277 3/	1,979	2,153	3,114		2,772	58,781	184,319	138,273	322,592
1971	106,185	826	107,011	13,821	4,049	4,204	16,907	38,981	11,158	42,473		1,856	6,123		2,415	64,025	210,017	146,287	356,304
1972	46,784	645	47,429	20,709	2,882	1,762	17,218	42,571	9,283	25,852	914	2,984	1,536		504	41,073	131,073	155,756	286,829
1973	50,415		50,415	17,271	3,900	2,795	26,322	50,288	19,651	84,088	173	2,651	1,545		3	108,111	208,814	134,927	343,741
1974	58,428	57	58,485	10,011	4,257	2,408	27,625	44,301	18,095	46,192	1,830	2,148	2,353		1,183	71,801	174,587	172,038	346,625
1975	66,499	98	66,597	6,298	1,229	1,567	18,887	27,981	4,350	40,189	293	2,183	3,035		124	50,174	144,752	155,955	300,707
1976	55,976	586	56,562	2,549	3,109	2,751	18,347	26,756	7,571	28,493	135	1,760	2,075	55	2,384	42,473	125,791	115,920	241,711
1977	108,058	166	108,224	2,524	6,079	2,835	21,843	33,281	14,092	20,220	2,819	2,490	2,463	29,659	829	72,572	214,077	71,143	285,220
1978	163,796	32,006	195,802	3,639	4,499	793	19,630	28,561	11,058	13,481	21,299	2,945	2,087	14,716	42	65,628	289,991	111,433	401,424
1979	87,841	64,631	152,472	4,570	4,859	3,868	9,275	22,572	11,287	14,335	6,951	4,034	1,214	11,576	236	49,633	224,677	142,943	367,620
1980	60,530	76,365	136,895	3,681	6,504	864	14,836	25,885	11,671	8,732	5,688	2,582	1,735	20,115	778	51,301	214,081	109,189	323,270
1975-1979 Avg.	96,434	19,497	115,931	3,916	3,955	2,363	17,596	27,830	9,672	23,345	6,287	2,382	2,175	11,201	732	56,096	199,858	119,478	319,336
1970-1979 Avg.	89,104	3/	92,878	9,331	3,887	2,687	19,600	35,505	13,703	33,361	3,633	2,520	2,555	5/	1,049	62,427	190,809	134,468	325,277
1963-1979 Avg.	73,038	3/	75,258	13,264	6,955	2,921	4/	68,200 4/	5/	5/	5/	2,020	1,961	5/	5/	41,571	184,912	133,341	318,254

1/ Primarily District 191.
2/ Includes District 116, Fairweather Grounds
3/ District 117.
4/ Not strictly comparable due to inclusion of District 116 data in Area 114.
5/ Insufficient data.

SOURCES: ADF&G. Computer Services catch reports. Unpublished data (1969-1980).
INPFC. Statistical Yearbook (1961-1968).

Table 2. Southern Southeastern Alaska commercial chinook salmon catches by district and year, and selected period averages, 1961-1980.

Number of Fish

	Ketchikan Area						Petersburg Area							
	Clarence Strait		South Prince of Wales		Offshore		Sumner Strait	North Prince of Wales		Stikine Strait	Chatham Strait	Frederick Sound		Southern Districts
Year	101 1/ 2/	102	103	104	150/152	Total	105	106	107	108	109	110	Total	Total
1961 3/														
1962 3/														
1963	21,054	16,381	14,738	6,895		59,068	1,638	12,934	4,000	6,105	10,792	16,106	51,575	110,643
1964	33,789	15,674	19,056	19,436		87,955	2,186	15,782	5,813	5,904	11,983	20,470	62,138	150,093
1965	27,955	5,749	12,401	31,115		77,220	3,884	10,477	4,809	5,655	7,028	12,484	44,337	121,557
1966	24,381	10,345	11,797	34,546		81,069	5,118	16,122	3,980	6,883	10,482	15,258	57,843	138,912
1967	24,715	11,141	9,216	30,326		75,398	7,016	11,999	4,002	9,249	16,269	17,952	66,487	141,885
1968	27,236	6,999	21,143	26,152		81,530	3,370	13,765	4,550	6,881	13,035	16,391	57,992	139,522
1969	24,257	9,235	11,901	35,566		80,959	2,160	7,098	1,170	6,690	7,221	14,224	38,563	119,522
1970	19,564	17,091	10,960	45,737		93,352	3,505	9,797	2,524	5,553	6,052	17,490	44,921	138,273
1971	22,683	8,249	7,551	72,356		110,839	7,537	5,800	4,120	5,797	4,872	7,322	35,448	146,287
1972	42,083	12,334	11,401	45,392		111,210	1,634	10,696	7,442	12,660	3,709	8,405	44,546	155,756
1973	34,640	5,140	8,106	33,819		81,705	690	11,143	5,714	13,914	6,450	15,311	53,222	134,927
1974	29,899	5,886	11,152	69,652	8	116,589	5,816	10,891	7,159	11,665	5,115	14,795	55,441	172,038
1975	32,212	6,226	27,985	50,033	120	116,576	6,664	12,253	5,427	3,078	4,019	7,938	39,379	155,955
1976	26,661	5,131	38,374	13,744	322	84,232	5,250	9,581	3,731	1,726	5,814	5,586	31,688	115,920
1977	13,103	4,037	3,901	29,226		50,267	1,550	5,003	2,579	1,976	5,510	4,258	20,876	71,143
1978	19,935	7,911	13,796	40,667	273	82,582	1,590	5,472	4,781	1,441	11,976	3,591	28,851	111,433
1979	17,153	13,774	14,124	39,106	26,179	110,336	2,440	8,742	4,929	475	9,917	6,104	32,607	142,943
1980	11,201	10,827	11,292	19,194	20,698	73,212	2,547	4,802	3,674	1,150	14,250	9,554	35,977	109,189
1975-1979 Avg.	21,813	7,416	19,636	34,555	9,396	88,718	3,499	8,210	4,290	1,739	7,447	5,495	30,680	119,398
1970-1979 Avg.	25,793	8,578	15,035	43,973	4/	96,029	3,668	8,938	4,841	5,829	6,343	9,080	38,698	134,727
1963-1979 Avg.	25,960	9,488	14,742	36,692	4/	88,440	3,650	10,444	4,514	6,215	8,615	11,981	45,053	133,493

1/ Includes Dixon Entrance and Hecate Strait.
2/ Data from 1969 to 1980 may include some invalid fish ticket entries due to computer program error.
3/ District catches in 1961 and 1962 are not comparable with later data due to district revisions in 1963.
4/ Insufficient data.

SOURCES: ADF&G. Computer Services catch reports. Unpublished data (1969-1980).
INPFC. Statistical Yearbook (1961-1968).

Table 3. Southern Southeastern Alaska commercial troll chinook salmon catches by district and year, and selected period averages, 1969-1980.

Number of Fish

	Ketchikan Area						Petersburg Area							
	Coastal							North						
	Clarence Strait		Prince of Wales		Offshore		Sumner Strait	Prince of Wales		Stikine	Chatham Strait	Frederick Sound		Southern Districts
Year	000[1/]	102	103	104	150/152	Total	105	106	107	108	109	110	Total	Total
1969	23,570	8,594	11,899	33,188		77,251	2,156	6,226	1,168	1,676	7,163	14,210	32,599	109,850
1970	18,810	16,872	10,800	44,915		91,397	3,505	9,003	1,863	2,346	5,876	16,891	39,484	130,881
1971	21,794	7,457	7,261	71,205		107,717	7,528	4,415	4,027	2,242	4,664	7,322	30,198	137,915
1972	36,910	11,313	11,162	43,222		102,607	1,629	8,088	3,651	3,330	3,408	7,670	27,776	130,383
1973	33,312	4,284	8,081	31,288		76,965	686	9,093	4,852	4,661	6,393	15,192	40,877	117,842
1974	22,629	5,363	11,059	66,507	8	105,566	5,762	8,927	6,289	3,468	4,845	14,612	43,903	149,469
1975	30,224	5,685	27,794	48,910	120	112,734	6,663	9,646	5,384	1,544	3,998	7,938	35,173	147,907
1976	24,783	4,916	38,334	12,637	322	80,992	5,250	9,186	3,707	603	5,814	5,586	30,146	111,138
1977	11,724	3,636	3,826	25,015		44,201	1,550	4,293	2,419	533	5,491	4,261	18,547	62,748
1978	15,354	4,936	13,728	33,016	273	67,307	1,589	2,761	3,827	910	11,971	3,591	24,649	91,956
1979	12,997	12,637	14,016	31,797	26,179	97,626	2,433	5,864	4,510	384	9,729	6,078	28,998	126,624
1980	8,999	9,825	11,215	8,550	20,698	59,287	2,539	4,217	3,674	519	14,118	9,545	34,612	93,899
1975-1979 Avg.	19,016	6,362	19,540	30,275	5,379	80,572	3,497	6,350	3,969	795	7,401	5,491	27,503	108,074
1970 1979 Avg.	22,854	7,710	14,606	40,851		88,705	3,660	7,128	4,053	2,002	6,219	10,335	31,975	120,680

1/ Includes catches from Dixon Entrance and Hecate Strait. May also include some invalid catches due to computer program error.

SOURCE: ADF&G. Computer Services catch reports. Unpublished data (1969-1980).

Table 4. Northern and total Southeastern Alaska commercial troll chinook salmon catches by district and year, and selected period averages, 1961-1980.

Number of Fish

	Sitka Area			Juneau Area					Yakutat and Fairweather Grounds							
Year	Coastal 113	Offshore 154	Total	Taku 111	Chatham Strait 112	Icy Strait 114	Lynn Canal 115	Total	Fair-weather Grounds 116	Offshore 157	Offshore 189	Other	Total	Northern Districts Total	Southern Districts Total	Southeast Region Total
1961																204,276
1962																173,578
1963																243,679
1964																329,461
1965																258,730
1966																282,090
1967																274,673
1968																304,455
1969	61,076		61,076	10,637	2,381	35,618	1,982	50,654	65,205			2,857	68,062	179,792	109,850	289,642
1970	85,622		85,622	8,481	3,156	18,121	2,091	31,849	30,486	18,277 1/		7,706	56,469	173,940	130,881	304,821
1971	106,116	826	106,942	6,947	3,422	15,228	1,183	26,780	11,158	42,473		8,449	62,080	195,802	137,915	333,717
1972	46,705	645	47,350	9,724	1,116	14,133	685	25,658	9,283	25,852		3,562	38,697	111,705	130,383	242,088
1973	50,390		50,390	7,472	2,750	23,576	316	34,114	19,651	84,088		1,629	105,368	189,872	117,842	307,714
1974	58,382	57	58,439	7,103	3,843	26,979	737	38,662	18,095	46,192		5,297	69,584	166,685	149,469	316,154
1975	66,434	98	66,532	4,116	1,229	18,865	751	24,961	4,350	40,189		3,411	47,950	139,443	147,907	287,350
1976	56,424	586	57,010	792	3,108	18,337	609	22,846	7,571	28,593	55	4;524	40,743	120,599	111,138	231,737
1977	107,844	166	108,010	1,456	6,089	21,843	1,621	31,009	14,092	20,220	29,659	6,052	70,023	209,042	62,748	271,790
1978	163,124	32,006	195,130	1,709	4,444	19,620	256	26,029	11,058	13,481	14,716	23,306 2/	62,561	283,720	91,956	375,676
1979	87,345	64,721	152,066	864	4,764	9,275	294	15,197	11,287	14,335	11,576	8,136	45,334	212,597	126,624	339,221
1980	60,146	76,365	136,511	1,045	6,470	14,795	319	22,629	11,671	8,731	20,115	7,701	48,218	207,358	93,899	301,257
1975-1979 Avg.	96,234	19,515	115,750	1,787	3,927	17,588	706	24,008	9,672	23,364	11,201	9,086	53,322	193,080	108,074	301,155
1970-1979 Avg.	82,839		92,749	4,866	3,392	18,598	854	27,711	13,703	33,370	3/	7,207	59,881	180,341	120,680	301,027
1961-1979 Avg.																282,676

1/ District 117.
2/ Primarily District 181.
3/ Insufficient data.

SOURCE: ADF&G. Computer Services catch reports. Unpublished data (1969-1980).
INPFC. Statistical Yearbook (1961-1968).

Table 5. Southeastern Alaska commercial net and trap chinook salmon catches, and selected period averages, 1961-1980.

Number of Fish

Year	Purse Seine: Ketchikan 101/102/103/104	Purse Seine: Other[1/]	Drift Gill Net: Portland Canal 101	Drift Gill Net: N. Prince of Wales 106	Drift Gill Net: Stikine 108	Drift Gill Net: Taku 111	Drift Gill Net: Lynn Canal 115	Set Net: Yakutat 180/182/183	Trap: Annette Island 101	Total
1961	2,635	3,156	917	461	9,687	7,480	800[1/]	2,534	27	27,697
1962	5,880	6,177	1,499	1,427	8,293	5,890	800[1/]	2,748	7	32,721
1963	2,583	4,182	508	1,564	6,105	2,650	280[1/]	942		18,814
1964	7,485	9,334	1,908	2,082	5,904	2,509	823[1/]	2,005		32,050
1965	7,743	7,423	1,079	1,802	5,655	4,170	1,856[1/]	1,468		31,196
1966	3,933	7,943	642	1,666	6,883	4,829	933[1/]	2,152		28,981
1967	6,685	2,386	2,182	1,318	9,234	5,417	1,219[1/]	2,190		30,631
1968	7,025	6,310	589	1,324	6,881	4,904	1,582[1/]	656	122	29,393
1969	2,874	4,169	676	867	5,015	6,981	1,734	1,821		24,137
1970	1,601	4,216	340	785	3,207	3,357	1,798	2,272		17,576
1971	2,066	2,812	722	1,336	3,555	6,874	3,021	1,945		22,331
1972	7,156	9,841	1,294	2,561	9,330	10,953	1,077	2,376	135	44,723
1973	3,707	5,021	1,007	1,931	9,253	9,799	2,479	2,730	25	35,952
1974	4,233	2,479	776	1,924	8,187	2,908	1,671	2,104	15	24,297
1975	1,878	181	1,963	2,581	1,534	2,182	816	2,224	3	13,362
1976	1,379	47	1,816	384	1,123	1,757	2,142	1,830	45	10,523
1977	4,811	416	1,204	671	1,433	1,068	1,214	2,549	51	13,417
1978	12,513	1,485	2,627	2,682	531	1,928	536	3,055	135	25,492
1979	8,698	1,374	3,752	2,720	91	3,702	3,574	4,297		28,208
1980	11,987	506	1,569	580	631	2,422	440	2,797		20,932
1975-1979 Avg.	5,856	701	2,272	1,808	942	2,127	1,656	2,791	47	18,200
1970-1979 Avg.	4,804	2,787	1,550	1,758	3,824	4,453	1,833	2,538	41	23,588
1961-1979 Avg.	4,994	4,155	1,342	1,583	5,363	4,703	1,492	2,205	30	25,868

1/ Primarily Districts 107, 113, and 114.

SOURCES: ADF&G (1979). Supportive material for the 1980 regulatory program for the Southeast Alaska troll salmon fishery. Final Draft (1961-1968).

ADF&G. Computer Services catch reports. Unpublished data (1969-1980).
ADF&G. Statistical Yearbook (1961-1968).

Table 6. Southeastern Alaska sport chinook catches by area and year, and 1977-1980 average, 1961-1980.

Number of Fish

	Ketchikan					Prince of Wales			Petersburg-Wrangell					Sitka		
										Boat						
Year	Behm Canal	Clarence Strait	Other	Shoreline	Total[a]	Boat	Shoreline	Total	Blind Slough	Gray Pass	Other	Shoreline	Total	Boat[1]	Shoreline	Total
1961																
1962																
1963																
1964																
1965														155[d]		155
1966					1,179[c]									188[d]		188
1967					594									214[d]		214
1968					1,667									230[d]		230
1969					2,385									564[d]		564
1970					546					461[d]			461	194[d]		194
1971					2,563					352[d]			352	225[d]		225
1972					7,575											
1973					3,585											
1974					1,239[c]											
1975																
1976																
1977[e]	1,316	1,050	2,178	128	4,672	802	9	811	448	818	1,194	211	2,671	1,716	22	1,738
1978	1,619	571	1,573	82	3,845	1,794	23	1,817	373	0	1,549	187	2,109	1,841	0	1,841
1979	900	1,091	2,119	55	4,165	827	36	863	673	136	1,100	264	2,173	2,045	9	2,054
1980	1,817	852	2,703	43	5,415	1,231	43	1,274	809	267	2,204	215	3,495	1,455	34	1,489
1977-1980 Avg.	1,278	904	1,957	88	4,227	1,141	23	1,164	498	318	1,281	221	2,318	1,867	10	1,878

-Continued-

Table 6. Southeastern Alaska sport chinook catches by area and year, and 1977-1980 average, 1961-1980 (continued).

Number of Fish

	Juneau				Haines-Skagway			Glacier Bay		Yakutat				Area Total			
	Boat																
Year	Doty's Cove-Berner W. to Pt. Retreat	Other	Shoreline	Total[b/]	Boat	Shoreline	Total	Boat	Total	Boat	Shoreline	Fresh-Water[2/]	Total	Boat	Shoreline	Fresh-Water	Total
1961				828													828
1962				520													520
1963				2,234													2,234
1964				2,780													2,780
1965				1,634													1,789
1966				2,726													4,093
1967				1,599													2,407
1968				3,075													4,972
1969				2,141													5,090
1970				2,886													4,087
1971				3,735													6,875
1972				1,742													9,317
1973				2,604													6,189
1974				2,326													3,565
1975				1,277													1,277
1976				2,184													2,184
1977[e/]	5,066	484	827	6,377	462	9	471	356	356	79	9	265	353	15,969	1,215	265	17,449
1978	4,975	326	385	5,686	734	35	769	315	315	47	0	210	257	15,717	712	210	16,639
1979	5,390	273	272	5,935	664	0	664	282	282	136	0	309	445	15,636	636	309	16,581
1980	6,122	447	499	7,068	749	43	792	241	241	77	9	353	439	18,974	886	353	20,213
1977-1980 Avg.	5,144	361	495	5,999	620	14	635	318	318	87	3	261	352	15,774	854	261	16,890

1/ 1965-1971 data from Sitka salmon derby only.
2/ Mostly Situk River.

SOURCES: 1961-1976: a: Siedelman, Donald L. 1981. Harvest estimates of selected fisheries throughout Southeast Alaska. ADF&G. Annual Report 1980-1981.
b: Schwan, Mark W. 1981. Harvest estimates of selected fisheries throughout Southeast Alaska. ADF&G. Annual Report 1980-1981.
c: ADF&G. 1979. Supportive material for the 1980 regulatory program for the Southeast Alaska troll salmon fishery.
d: ADF&G. 1972. Saltwater sport fish harvest studies in Southeast Alaska. Annual Report 1971-1972.
1977-1980: e: Mills, Michael J. 1981. Statewide harvest study. ADF&G. Annual Report 1977-1980.

Table 7. Southeastern Alaska chinook salmon escapement estimates, Juneau area, by river, year, and survey type, 1961-1980[a].

Number of Fish

	Taku River Drainage								Chilkat River Drainage		Yakutat					
				Tatsamenie Drainage							Alsek River Drainage				Situk Drainage	
Year	King Salmon River	Nakina River	Kowatua Drainage	Tatsamenie R.	Others	Nahlin River	Tseta River	Dudidontu River	Big Boulder	Other	Klukshu River	Cannery Creek	Other	Akwe River	Situk River	(Weir)
1961															400A	
1962	117F					216A	81A	25A			86A				1,000A	
1963																
1964											20A		20A		725A	
1965		3,050A	200A		50A	37A	18A	110A			100A				1,500A	
1966			14A	150A		300A	150A	267A	330F		1,000A				800A	
1967			250A			300A	350A	600A	150F	5F	1,500A				400A	
1968			1,100A	150A	650A	450A	230A	640A	259F	11F	1,700A					
1969			3,300A	800A							700A			11A	2,500A	
1970			1,200A	530A		26A[b]	25A[b]	10A	176F	6A	500A					
1971	94F		1,400A	320A	40A	473A		165A	56F		300A				964A	
1972	90F	1,000F	170A	170A		280A	80A	103A			1,100A	12A			400A	
1973	211F	2,000H	100H	200H		300H		200H				9A		55A	510B	
1974	104F	1,800H	235A	120A		900H	4A	24A			62A			62A	702F	
1975	42F	1,800H				274H		15H	21F		58A	72A	79A	38A	1,180F	
1976	65H	3,000H	341H	620H		725H		40H	25F		1,278W[c]		34A	20A	809B	1,933
1977	134H	3,850H	580H	573H		650H		18H	25F		3,144W[c]			70A	340B	1,872
1978	57H	1,620H	490H	550H		624H	21H			2F	2,976W[c]			150A	146B	1,103
1979	88A	2,110A	430H	750H		857H		9H			4,404W[c]			500A	150B	1,754
1980	70H	4,500H	450H	905H		1,531H		158H		38A	2,637W[c]			300A	10B	1,125[1]

1/ Weir out part of time.

A - Aerial
B - Boat
F - Foot
H - Helicopter
W - Weir

SOURCE: a/ ADF&G. Unpublished escapement summaries.
b/ Kissner, Paul D., Jr. 1981. A study of chinook salmon in Southeast Alaska. ADF&G. Annual Report 1979-1980. Project F-9-12, 21 (AFS-41).
c/ Cook, Rodney. 1981. Information concerning the management needs of the Southeast Alaska troll fishery for chinook salmon.

Table 8. Southeastern Alaska chinook salmon escapement estimates, Petersburg area, by river, year, and survey type, 1961-1980[a].

Number of Fish

					Bradfield River				Stikine River Drainage					Tahltan Drainage						
Year	Crystal Creek	Oerns Creek	Tom Lake Creek	Harding River	N.Fork	E.Fork	Eagle River	North Arm	Goat Creek	Andrews Creek	Katete Drainage	Christine Creek	Shakes Creek	Tahltan River	Tahltan L. Weir	Beatty Creek	Little Tahltan R.	Tuya River	Chuck River	Glen Creek
1961			1 F					138 F		103 F										
1962								800 A		300 A										
1963			8 B					187 F		500 A/H									12 A	
1964							10 A			400 H										
1965			100 A	25 H			600 H			100 A				85 c/						
1966			15 F				3 F			75b/				318 c/					25 H	
1967																	800 H		20 A	
1968																				
1969								3 A		12 A										
1970		100 A																	12 A	
1971										305 A										
1972			20 A		2 A	12 A	100 A													
1973				10 A						40 A									45 A	100 A
1974				35 A						129 A									1 B	
1975								3 A	25 F	260 F				2,908 H	4 W		700 H			
1976	250 W			13 A		13 A	13 A			436 W				120 H	4 W		400 H		12 A	
1977	257 W			410 A			3 A			448 W	290 A			25 A			800 H			
1978	137 W			12 H		63 A	8 H	24 F		430 W	11 A	125 F	77 F	756 H			632 H	28 A		
1979	724 W					10 A		16 F	13 F	433 W				2,118 H			1,166 H		12 A	
1980	874 W			4 F	30 H	6 H		68 F	24 F	593 W			12 H	960H		122H	2,137 H			

A - Aerial
B - Boat
F - Foot
H - Helicopter
W - Weir

SOURCE: a/ ADF&G. Unpublished escapement summaries.
b/ Kissner, Paul D., Jr. 1981. A study of chinook salmon in Southeast Alaska. ADF&G. Annual Report 1979-1980, Project F-9-12, 21 (AFS-41).
c/ Airlifted over slide.

Table 9. Southeastern Alaska chinook salmon escapement estimates, Ketchikan area, by river, year, and survey type, 1961-1980[a].

Number of Fish

Year	Keta River	Marten River	Wilson River	Blossom River	Chickamin River	Humpy Creek	King River	Choca River	Grant Creek	Eulachan River	Sawmill Creek	Clear Creek	Unuk[b] River	Klehini River	Saks River
1961	44 G[b]			68 G[b]	336 G[b]					270 F			673 F		
1962					775 A[b]	50 A							331 A		
1963	30 A	25 A	10 A	825 A[b]	450 A[b]	3 A	200 A	75 A	15 A	800 A			1,070 A		7 A
1964										25 A					
1965		43 H	50 A				75 A								
1966	75 A	10 A	60 A	200 A		50 F		20 F	100 A					3 A	
1967	86 H	7H	8 H				45 H		15 H	60 H					
1968						30 H	20 H		4 H	75 H			650 A		
1969	200 H	10 A	10 A		345 A[b]	10 H	45 H		50 H	150 H			475 A	3 H	15 H
1970				100 H					1 A						
1971	2 A									30 A					
1972				700 A[b]	860 A[b]								885 A		
1973			30 A		229 H[b]	14 A	65 A		38 A	85 A			182 A	7 H	
1974	25 H			166 H	176 H[b]		11 H			68 H					
1975	203 H	15 H	7 H	153 H	351 H[b]	7 H	30 H	1 H		17 H			55 H		
1976	84 H			68 H	122 H[b]		1 A			7 A			198 H		
1977	230 H			112 H	235 H[b]					57 H	15 H	130 H	1,166 H		
1978	392 H	2 A		143 H	181 H					218 H	15 H	85 H	1,765 H/W/F		
1979	426 H		36 H	54 H	140 H					48 H	20 H	30 H	576 H/W/F		
1980	192 H			89 H	261 H					95 A	18 H	28 H	1,052 H/W/F		

A - Aerial
F - Foot
G - Ground
H - Helicopter
W - Weir

SOURCE: a/ ADF&G. Unpublished escapement summaries.
b/ Kissner, Paul D., Jr. A study of chinook salmon in Southeast Alaska. ADF&G. Annual Report 1979-1980. Project F-9-12, 21 (AFS-41).

Table 10. Age composition of Southeastern Alaska commercial troll chinook salmon samples, by catch area and year, 1972-1978.

Year	Location	Number of Fish	Percent Composition Age 0.2	0.3	0.4	0.5	1.1	1.2	1.3	1.4	1.5
1972[a/]	Fairweather Grounds	70	21.4	34.3			4.3	28.6	11.4		
1973											
1974[b/]	Craig, Petersburg, Sitka Pelican	1,470	10.2	35.4	8.8	0.7	2.0	17.7	19.0	4.8	1.4
1975[b/]	Craig, Petersburg, Sitka Pelican	1,687	10.1	35.3	8.5	0.5	2.2	19.0	17.8	5.5	1.0
1976[b/]	Craig, Petersburg, Sitka Pelican	2,090	6.8	28.8	10.0	2.2	3.5	25.8	18.7	3.6	0.4
1978[c/]	Stat Area 104	99		54.6	11.1			13.1	19.2	2.0	
1978[c/]	Stat Area 113	136	5.9	50.0	16.9	0.7		7.4	14.7	4.4	
1978[c/]	Stat Area 114-21	3		33.3				33.3	33.3		
1978[c/]	Stat Area 116-05	90	18.9	37.8	7.8			17.8	14.4	3.3	
1978[c/]	Stat Area 154	27		55.6	7.4			18.5	18.5		
1978[c/]	Stat Area 181	145	3.6	53.9	8.4			14.3	19.1	0.7	

SOURCE: a/ Kissner, Paul D. Jr. 1973. A study of chinook salmon in southeastern Alaska. ADF&G. Annual Report, 1971-1972. Project F-9-5,14(AFS-41).

b/ Davis, Alan and Christine Selin. 1977. Southeastern Alaska commercial troll fishery, 1976. ADF&G Technical Data Report No. 32.

c/ NPFMC-ADF&G. 1979. Pilot observer program for the troll salmon fishery off Alaska. Contract No. 78-9.

Table 11. Age composition of Alsek River commercial gill net chinook salmon samples, by year, 1961-1975.

Year	Number of Fish	Percent Composition Age 1.2	1.3	1.4	2.3	2.4
1961	542	19.2	71.2	4.8	4.1	0.6
1973	60	5.0	43.3	50.0	1.7	
1974	57	1.8	24.6	70.2	1.8	1.8
1975	96	2.1	42.7	50.0	2.1	3.1

SOURCE: Kissner, Paul D., Jr. 1976. A study of chinook salmon in southeast Alaska. ADF&G. Annual Report 1975-1976, Project F-9-8,17(AFS-41).

Table 12. Age composition of Stikine River commercial gill net chinook salmon catch samples, by year, 1972-1975.

Year	Number of Fish	Percent Composition Age 1.2	1.3	1.4	1.5	2.3
1972	57		35.1	63.2	1.8	
1973	91	1.1	22.0	71.4	5.5	
1974	103		32.0	60.2	5.8	1.9
1975	120	3.3	20.0	70.0	5.0	1.7

SOURCE: Kissner, Paul D., Jr. 1976. A study of chinook salmon in southeast Alaska. ADF&G. Annual Report 1975-1976, Project F-9-8,17(AFS-41).

Table 13. Age composition of Taku River commercial gill net chinook salmon catch samples, by year, 1961-1975.

Year	Number of Fish	Percent Composition Age 1.2	1.3	1.4	1.5	2.2	2.3	2.4
1961	519	4.2	63.8	26.6			3.7	1.7
1972	238	2.1	64.3	26.5	1.7		3.8	1.7
1973	141	2.8	14.9	78.0	3.5			0.7
1974	74		23.0	68.9	4.1	1.4	1.4	1.4
1975	61	3.3	25.9	44.3	1.6		3.3	1.6

SOURCE: Kissner, Paul D., Jr. 1976. A study of chinook salmon in southeast Alaska. ADF&G. Annual Report 1975-1976, Project F-9-8,17(AFS-41).

Table 14. Age composition of Southeastern Alaska sport catch samples, by fishery, 1972[a/].

Location	Number of Fish	Percent Composition												
		Sex		Age										
		Male	Female	0.2	0.3	0.4	1.1	1.2	1.3	1.4	1.5	2.1	2.2	2.3
Ketchikan Derby	98				2.0	3.1		13.3	51.0	29.6	1.0			
Sitka Derby	75			34.7	17.3		1.3	8.0	26.7	9.3	2.7			
Juneau Derby	276			0.4	3.3	0.4	1.1	35.5	56.9	1.1		0.4		1.1
Juneau General Area	126			1.6	2.4		5.6	50.8	31.0	4.0	1.6	0.8	2.4	
Haines Derby	47							4.3	21.3	59.6	14.9			
Klukshu-Tatshenshini[b/] (Alsek River)	13	38.5	61.5					7.7	76.9	15.4				

SOURCE: a/ Kissner, Paul D. Jr. 1973. A study of chinook salmon in southeast Alaska. ADF&G. Annual Report 1972-1973, Project F-9-5,14(AFS-41).

b/ Dept. of Fisheries and the Environment, Canada, 1977. Enumeration of the 1976 Salmon Spawning Populations in the Klukshu River.

Table 15. Sex and age composition of chinook salmon, Nakina carcass weir, Taku River, 1973-1980.

Year	Number of Fish	Percent Composition						
		Sex		Age				
		Male	Female	1.1	1.2	1.3	1.4	1.5
1973	2,325	73.6	26.4	14.5	36.7	12.6	27.8	0.3
1974	2,262	81.4	18.6	32.3	31.7	20.5	15.4	0.1
1975	956	92.8	7.2	23.9	52.8	13.4	9.8	0.1
1976 1/	1,196	67.8	32.2	5.4	34.5	36.9	22.9	0.3
1977	3,380	66.2	33.8	33.9	12.8	17.2	52.8	3.5
1978	3,551	94.2	5.8	64.1	25.8	2.6	7.1	0.4
1979	2,734	90.1	9.9	24.7	49.5	20.4	5.2	0.3
1980	2,242	70.8	29.2	21.7	24.2	28.8	25.4	0

1/ Partial weir at Grizzly Bar.

SOURCE: Kissner, Paul D., Jr. 1981. A study of chinook salmon in southeast Alaska. ADF&G. Annual Report. 1980-1981, Project F-9-13, 22(AFS-41).

CORDOVA AREA

The Cordova area includes all coastal waters and inland river systems entering the north-central Gulf of Alaska between Cape Suckling and Cape Fairfield (Figure 3). Major features of the area include all of Prince William Sound and the Bering and Copper Rivers. The Copper River system is the only major producer of chinook salmon in the Cordova area and supports commercial, subsistence, and sport harvests of these fish.

Catches of chinook salmon are of minor commercial importance when compared to those of other salmon species in the Prince William Sound area. Commercial Copper River chinook harvests have remained relatively stable in the last 2 decades. Most chinook salmon taken in the Cordova area are commercially harvested incidental to the Copper River District commercial sockeye salmon gill net fishery (1961-1979 average 19,000 chinook; Table 16). Lesser catches are made in a dip net and fishwheel subsistence fishery in the Copper River (1961-1979 average 1,200 fish; Table 17) and a sport fishery on the Gulkana River (1977-1979 average 1,700 fish; Table 18).

Chinook salmon escapement to the Copper River system has been monitored by aerial survey since 1966 and has also remained relatively stable (Table 19). Tag recovery and sonar estimates of Copper River chinook escapement are given in Table 20.

Age 1.4 fish have been the most abundant age class in Copper River commercial catches although age 1.3 fish have predominated in some years (Table 21). Age composition pattern in the commercial catch are not apparent as these data are not weighted by actual catches and sample sizes are small. Age composition of Copper River escapements was estimated only during the years 1971-1973 (Table 22). These data indicate a predominance of age 1.3 fish in the escapement. Tables 23 and 24 give age distributions, and sex and size distribution by age and year, since 1976.

More than 13,000 chinook salmon were taken in the Prince William Sound area in 1980. The majority of these fish (8,400) were commercially harvested in the Copper River District. The 1980 Copper River commercial harvest was the lowest catch since 1961 and well below the recent 5 and 10-year averages (26,000 and 24,000 fish, respectively). The reduced catch is primarily due to restrictions on fishing time and gill net mesh size regulations imposed to protect an anticipated weak return of Copper River sockeye salmon. In order to minimize the catch of Copper River sockeye, a maximum catch quota of 10,000 chinook salmon was established over a 4-week period. A total of 153 units of drift gear participated in this fishery. The harvest peaked in the fishing district during the first week in June when 1,600 fish were taken. The majority of the catch were age 1.4 fish (55.3%). Relatively fewer age 1.3 fish were observed in the catch than in past years, perhaps because gill net mesh size was required to be no smaller than 8-1/4 inches prior to 21 July.

A total of 2,300 chinook were reported taken in the Copper River subsistence fishery in 1980. This harvest is similar to the recent 5 and 10-year averages (2,100 and 1,700 fish, respectively) and well above the 19-year average of 1,200 fish. Due to an average return of chinook salmon to the Copper River during 1980, subsistence effort for this species was unrestricted.

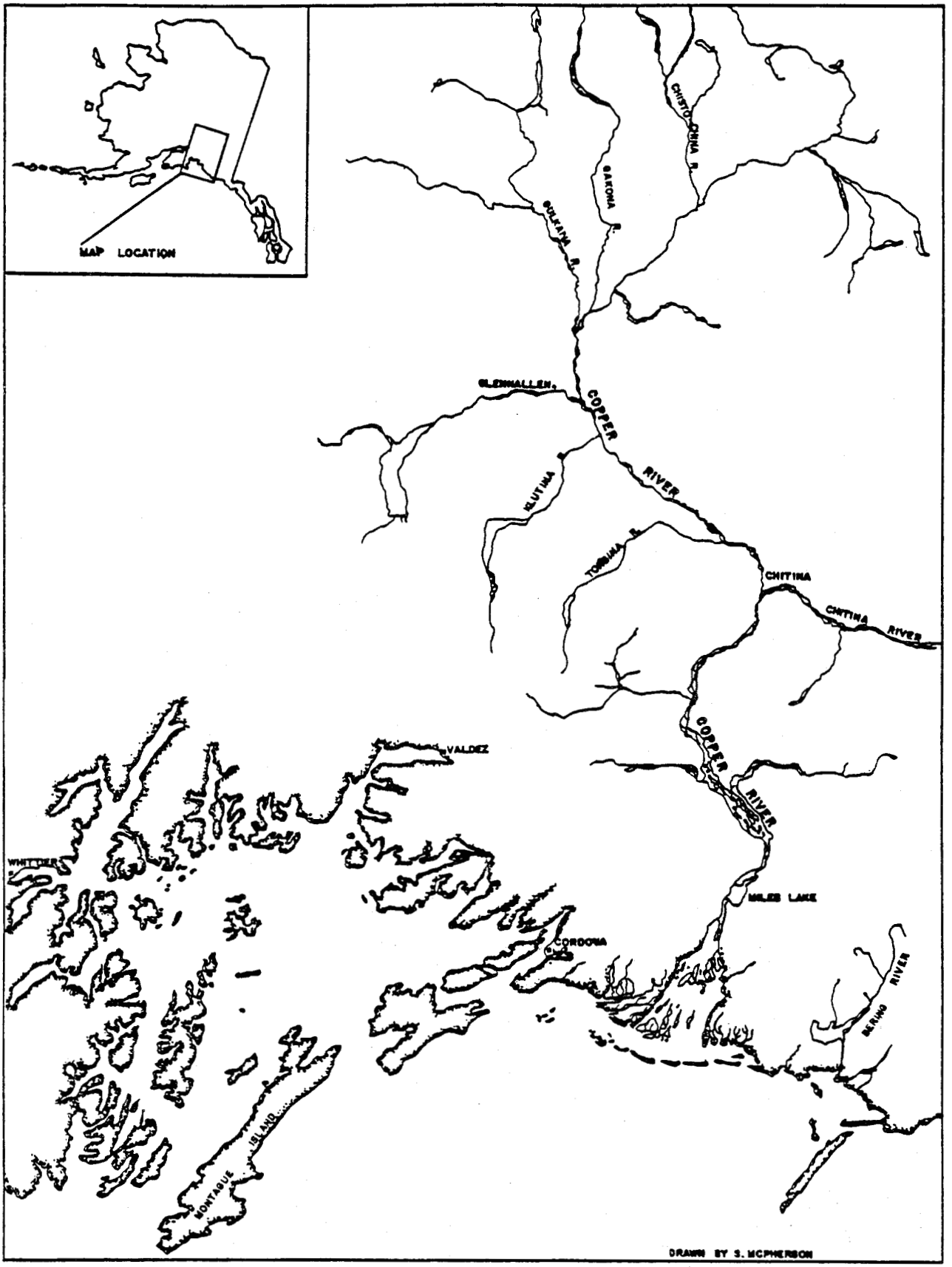

Figure 3. Cordova area.

An estimated 2,400 chinook were harvested in the sport fishery in 1980. Most of these fish (1,700) were taken in the Gulkana River. This harvest is above the 1977-1979 Copper River average of 1,400 fish and follows the recent trend toward increased sport catches in the Copper River drainage.

Aerial escapement counts of chinook in Copper River systems totaled 1,700 fish in 1980, not markedly different from past years. Escapement to the Copper River was gauged at 7,300 fish from sonar counts. Both of these measures indicate an average level of escapement.

Table 16. Cordova area commercial chinook salmon catches by district and year, and selected period averages, 1961-1980.

Number of Fish

Year	Prince William Sound					Copper River	Bering River	Cordova Area Total
	General	Coghill	Unakwik	Eshamy	Total			
1961					400	7,621	872	8,893
62					1,800	14,792	246	16,838
63					2,300	10,871	95	13,266
64					100	12,751	36	12,877
65					1,100	15,390	3	16,493
1966					700	11,422	36	12,158
67					3,600	9,853	20	13,473
68					1,523	9,743	10	11,276
69					3,340	14,040	44	17,424
70					1,031	19,375	26	20,432
1971	3,130	421			3,551	16,486	105	20,142
72	396	67	2	82	547	22,349	107	23,003
73	2,151	184	1	69	2,405	19,948	285	22,638
74	1,215	348	5	22	1,590	18,980	32	20,602
75	1,744	771	4		2,519	19,644	162	22,325
1976	855	185	4		1,044	31,483	228	32,755
77	450	164	3	31	648	22,089	127	22,864
78	340	675	27		1,042	29,062	331	30,435
79	867	1,138	11		2,016	17,308	384	20,078
80 2/	88	198			286	8,449	0	8,735
1975-1979 Avg.	851	587	10	6	1,454	23,917	246	25,691
1970-1979 Avg.	1/	1/	1/	1/	1,639	21,672	179	23,527
1961-1979 Avg.	1/	1/	1/	1/	1,645	17,011	166	18,841

1/ Insufficient data.
2/ Preliminary.

SOURCES: ADF&G Commercial Salmon Catches (1961-1980).
ADF&G Prince William Sound Area Annual Finfish Management Report (1961-1980).

Table 17. Reported Cordova area subsistence catches of chinook salmon, by catch, location and year, and selected period averages, 1961-1980.

Year	Upper Copper River	Copper River Flats	Prince William Sound	Cordova Area Total
1961	388	60	1	449
62	848	44		892
63	464	3	3	470
64	725	14		739
65	644	12		656
1966	555	47		602
67	419	83		502
68	644	11		655
69	719	16		735
70	427	66		493
1971	1,363	10		1,373
72	1,501	149		1,650
73	1,856	153		2,009
74	1,141	5		1,146
75	1,705			1,705
1976	2,017	1		2,018
77	2,171	10		2,181
78	2,050	37		2,087
79	2,372	45		2,417
80	2,256	19		2,275
1975-1979 Avg.	2,063	19	1/	2,082
1970-1979 Avg.	1,660	48	1/	1,708
1961-1979 Avg.	1,158	40	1/	1,199

1/ Insufficient data.

SOURCES: ADF&G Prince William Sound Area Annual Finfish Management Report (1960-1980).

Table 18. Estimated Cordova area chinook salmon sport catches by location and year, and 1977-1979 average, 1969-1980.

Number of Fish

Year	Copper River Drainage			Prince William Sound			Area Total
	Gulkana R.	Other	Total	Marine	Freshwater	Total	
1969 1/	500		500				500
1970 1/	500	100	600				600
1971 1/	500	200	700				700
1972							
1973							
1974 1/	900		900				900
1975 1/	697		697				697
1976 1/	296		296				296
1977 2/	421	111	532	247	181	428	960
1978 2/	606	35	641	58	35	93	734
1979 2/	2,440	508	2,948	332	10	342	3,290
1980 2/	1,688	413	2,101	268	34	302	2,403
1977-1979 Avg.	1,156	218	1,374	212	75	288	1,661

1/ Creel census.
2/ Mail questionnaires.

SOURCES: ADF&G. Inventory and cataloging of sport fish and sport fish waters of the Copper River, Prince William Sound, end of the Upper Susitna River drainages (1969-1976).

ADF&G. Alaska Statewide Sport Fish Harvest Studies (1977-1980).

Table 19. Copper River drainage aerial survey peak escapement counts of chinook salmon by tributary and year, 1966-1980.

Year	E. Fork Chistochina R.	Gulkana R.	Mendeltna R.	Kaina Cr.	St. Anne Cr.	Manker Cr.	Grayling Cr.	L. Tonsina R.	Indian R.	Total without Interpolation	Counts Missing	Total
1966	152	250	12	272	48	64	22	42	20 1/	862	1	882
67	291 1/	757 1/	6	123 1/	53	2	48 1/	129 1/	20 1/	61	6	1,429
68	150	757 1/	100	100	26	9	4	19	20 1/	382	3	1,185
69	200	147	38 1/	34	26 1/	19 1/	7	129 1/	20 1/	388	5	620
70	368	364	38 1/	162	35	17	48 1/	129 1/	20 1/	946	4	1,181
1971	512	269	56	81	4	30	45	200	20 1/	1,197	1	1,217
72	348	1,200	49	89	25	4	47	129 1/	13	1,775	1	1,904
73	476	623	15	172	26 1/	17	47	100	20 1/	1,450	2	1,496
74	137	1,317	15	55	32	29	49	65	4	1,654		1,654
75	71	741	38 1/	123 1/	26 1/	19	48 1/	161 1/	6	979	5	1,233
1976	289	777	35	37	15	6	17	98	61	1,335		1,335
77	132	1,090	73	91	10	15	48 1/	35	20	1,446	2	1,514
78	137	921	52	125	24	20	92	285	9	1,665		1,665
79	810	1,380	5	279	16	16	153	285	29	2,973		2,973
80	575	718	3	247	8	35	66	70	24	1,746		1,746

1/ Interpolated.

SOURCES: ADF&G. Unpublished data from K. Roberson (Revised from Copper River Technical Data Report [1966-1970]).

ADF&G. Prince William Sound Area Annual Finfish Management Report (1971-1980).

Table 20. Copper River chinook salmon escapement estimates by year, 1966-1980.

Year	Method	Minimum escapement estimate (Number of fish)
1966	Tagging	5,202
1967	Tagging	2,321
1968	Tagging	6,216
1969		
1970	Tagging	4,610
1971	Tagging	13,224
1972	Tagging	14,953
1973		
1974		
1975		
1976		
1977		
1978		
1979	Sonar	11,536 2/
1980	Sonar	7,318 1/ 2/

1/ Possible migration beyond this date. Increased water flow precluded segregation.

2/ Minimum estimates.

SOURCES: ADF&G. Copper River Technical Data Report (1966-1972)

ADF&G. Prince William Sound Area Annual Finfish Management Report (1979-1980).

Table 21. Sex and age composition of Copper River District commercial catch samples of chinook salmon by year, 1971-1980.

				Percent Composition								
	Number of	Sex		Age								
Year	Fish	Male	Female	0.3	1.2	0.4	1.3	1.4	2.3	1.5	2.4	Other
1971	36	54.0	46.0		19.4		25.0	50.0		5.6		
72												
73	199	54.3	45.7		0.5		34.1	59.6	2.1		3.7	
74	59	44.1	55.9		5.1		22.0	71.2			1.7	
75	111	44.3	55.7		2.4		34.8	49.1	4.8	1.6	6.8	0.5
1976	194	46.4	53.6	0.5	2.9	1.0	31.3	59.6	1.2	1.0	2.3	0.2
77	284	49.3	50.7		3.2		49.1	23.7	15.3	0.3	7.4	1.0
78	120	53.3	46.7		8.3		35.0	40.9	8.3		6.7	0.8
79	80	34.0	46.0				46.2	45.0	3.8		5.0	
80	219	45.2	54.8		0.9		28.3	55.3	7.8	0.9	5.9	0.9

SOURCES: ADF&G. Copper River Technical Data Report (1971-1979).
ADF&G. Prince William Sound Area Annual Finfish Management Report (1980).

Table 22. Sex and age composition of Copper River drainage escapement samples, by year, 1971-1973[1/].

				Percent Composition								
		Sex		Age								
Year	Number	Male	Female	0.2	1.1	0.3	1.2	1.3	1.4	2.3	1.5	Other
1971	127	44.0	66.0		1.6		26.0	47.2	25.2			
72	553	53.0	47.0	1.4	+	8.9	8.2	58.6	18.6	1.0	+	3.3
73	73	64.4	35.6		20.1		12.2	50.1	17.5			

1/ Fish sampled at Wood Canyon.

SOURCE: ADF&G. Copper River Technical Data Report (1971-1973).

Table 23. Age, sex, and size composition of Copper River District commercial catch samples of chinook salmon, 1980.

Sample period	Date	Sex		Age 1.2	1.3	2.2	1.4	2.3	1.5	2.4	2.5	Total
1	5/25/-5/31	Males	Number	2	22		59	6	2	7	1	99
			Percent	2.0	22.2		59.6	6.1	2.7	7.1	1.0	45.2
			Avg. length, mm	594	850		966	848	1,061	989	1,049	
1	5/25/-5/31	Females	Number		40	1	62	11		6		120
			Percent		33.3	0.8	51.7	9.2		5.0		54.8
			Avg. length, mm		850	809	957	849		891		
1	5/25/-5/31	Combined	Number	2	62	1	121	17	2	13	1	219
			Percent	0.9	28.3	0.5	55.3	7.8	0.9	5.9	0.5	100.0
			Avg. length, mm	594	850	809	962	848	1,061	944	1,049	

SOURCES: ADF&G. Prince William Sound Area Annual Finfish Management Report (1980).

Table 24. Mean weight and mean length by ocean age of Copper River District commercial chinook salmon catch samples by year and sex, 1963-1980.

		Length (mm)[b]														
		Males								Females						
Year	Mean Weight (lbs)[a]	1.1	1.2	1.3	1.4	2.3	1.5	2.4	2.5	1.2	1.3	2.2	1.4	2.3	1.5	2.4
1963	25.2															
1964	26.3															
1965	26.6															
1966	28.6															
1967	28.3															
1968	28.0															
1969	26.9															
1970	30.8															
1971	27.4															
1972 1/	30.1															
1973 1/	32.3	897	883	987							904		924			
1974 1/	33.4	604	844	991						638	806		952			
1975 1/	27.8	598	860	988			1,038			613	829		938			
1976 1/	28.4	641	892	987			1,068			679	880		928		897	
1977 1/	28.4	655	870	990			1,025			635	851		948			
1978	27.3															
1979	27.3															
1980	28.0 2/	594	850	966		848	1,061	989	1,049		850	809	957	849		891

1/ Length data is by ocean age only.

2/ Preliminary.

SOURCES: a. ADF&G. Prince William Sound Area Annual Management Report (1963-1980).

b. ADF&G. Prince William Sound Finfish Technical Data Report (1973-1979).
ADF&G. Prince William Sound Annual Management Report (1980).

COOK INLET

The Cook Inlet area includes all coastal waters and inland drainages of Cook Inlet and Resurrection Bay north of Cape Douglas and west of Cape Fairfield, including the Barren Islands (Figure 4). The area is divided into 6 commercial fishery management areas: the Northern, Central, Southern, Kamishak, Outer, and Eastern Districts, including primarily marine areas. Sport fish districts, which cover mostly fresh waters, are the Kenai Peninsula, Westside Susitna River, Westside Cook Inlet, Eastside Susitna River, and the Anchorage-Knik area. Cook Inlet is unique in Alaska in that annual sport catches of chinook salmon have recently exceeded commercial harvests. A directed subsistence fishery for chinook salmon was reestablished in Cook Inlet at Tyonek in 1980 for the first time in 16 years. Most observed chinook salmon spawning occurs in Susitna River tributaries (mainly the Deshka River, and Lake and Alexander Creeks). Production also occurs in a number of other systems; notably the Kenai, Anchor, Kasilof, Ninilchik, Beluga, and Chuit Rivers.

The Cook Inlet commercial chinook salmon harvest, which is incidental to other salmon species, has ranged from 4,600 to 20,300 fish and averaged 12,000 chinook from 1961 through 1979 (Table 25). This average is similar to both the recent 5 and 10-year averages. The peak commercial harvest of 190,000 chinook occurred in 1951. Most of the commercial chinook catch is taken in the Central District (1961-1979 average of 9,200 fish; Table 25) primarily with set gill nets.

The sport harvest of chinook salmon prior to 1977 was estimated using creel census samples and estimates averaged 3,200 fish in the period 1961 through 1976 (Table 27) for the entire area. Since 1977 the sport catch has been estimated using mail questionnaire data and has averaged 22,900 fish. The largest catches come from the Kenai River (7,900 fish average in 1977-1979) and marine waters near Deep Creek (4,400 fish average in 1977-1979).

Subsistence catches are not well documented, but the directed fishery for chinook salmon was closed from 1964 until 1969 (Table 26). Total personal-use harvest in the Cook Inlet area is believed to have averaged several thousand fish annually. Personal-use fisheries have been gradually relocated from the tributaries of major rivers, to the mainstem, and finally to salt water.

Escapement surveys have been conducted on many rivers and tributaries in the area, with escapement ranging from about 1,900 fish in 1961 to over 100,000 in 1977 (Tables 28-30). Escapement estimates were derived both from aerial and ground surveys. Approximately 80% of observed escapements occurred in Susitna River tributaries (Tables 29 and 30).

Scale samples have been collected from time to time for age analysis from several locations in the area. Age compositions were calculated from length frequencies (and compared with scale analysis) for some tributaries of the Susitna River. Age structure summaries of historical data collected on the Susitna River is pending. Age 1.3 and 1.4 fish are dominant age classes in most streams and sport fisheries sampled.

A total of 32,000 chinook salmon were harvested in the Cook Inlet Area in 1980 (Tables 25-27). Very few escapement surveys were done because of poor weather. For the sixth consecutive year, sport harvest of chinook salmon in Upper Cook Inlet exceeded the commercial harvest. Sport fishermen harvested an estimated 17,000 chinook in 1980, somewhat below the 23,000 fish average during the previous 3 years (Table 27). The 1980 commercial catch of 13,000 chinook was similar to recent five, ten, and nineteen year averages (13,000, 12,000, and 12,000 fish, respectively; Table 25).

As a result of recent court decisions governing subsistence fishing in Cook Inlet, the area was opened in 1980 to the taking of chinook salmon for the first time since 1964. The reported harvest in 1980 was 1,900 fish.

Adverse weather during the main spawning periods in the Cook Inlet area seriously hampered efforts to estimate escapements in Susitna River tributaries and in Westside Cook Inlet streams. The observed total of spawning chinook salmon was only 5,000 fish, but it was felt that actual escapement more closely approached the 1975-1979 average of 66,000. The poor weather is also believed to have adversely affected the 1980 sport harvest.

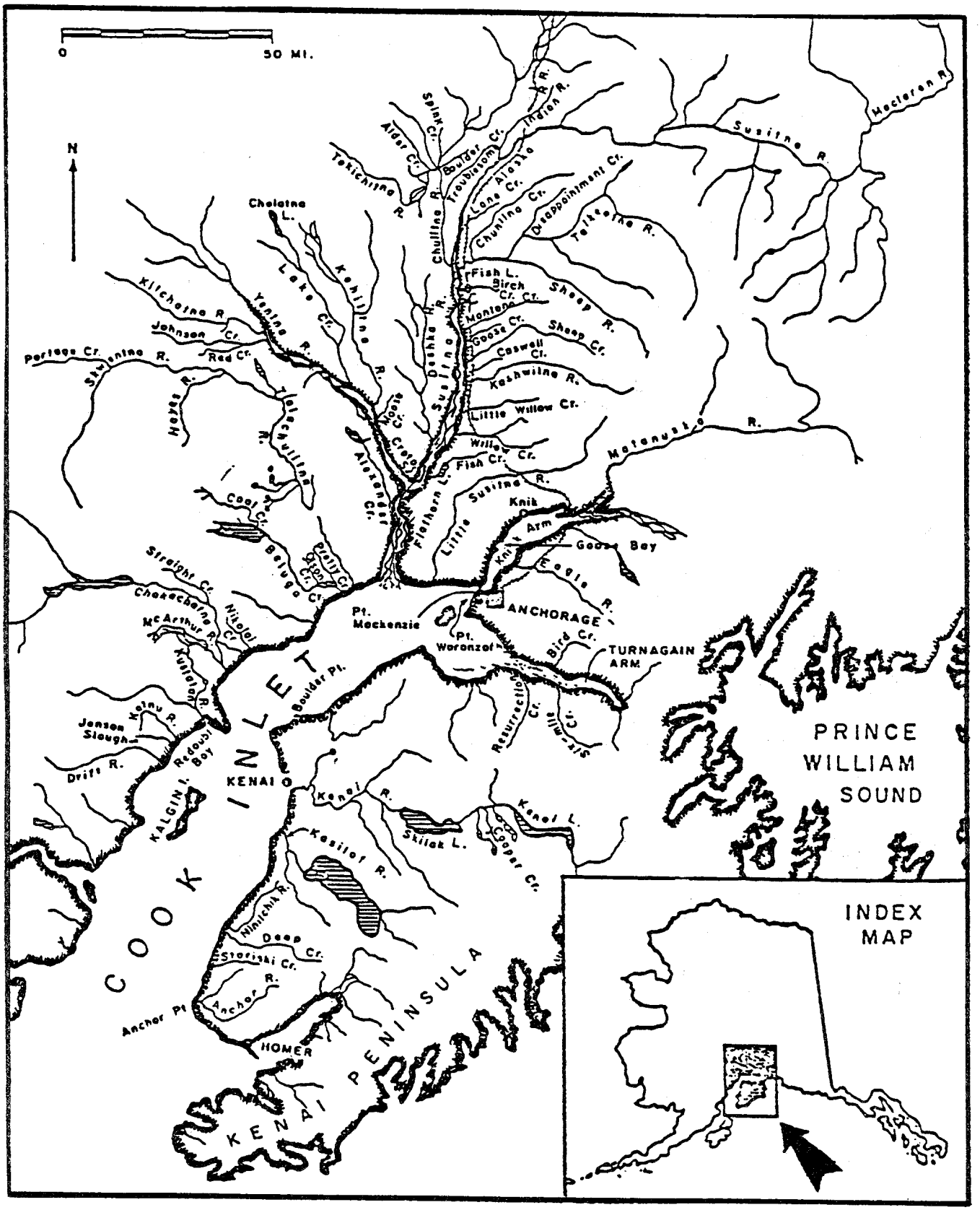

Figure 4. Cook Inlet area.

Table 25. Cook Inlet commercial chinook salmon catches by district and year, and selected period averages, 1961-1980.

	Number of Fish						
	Lower Cook Inlet			Upper Cook Inlet			
Year	Southern District	Other Districts	Total	Central District	Northern District	Total	Area Total
1961	39	2	41	11,982	7,755	19,737	19,778
1962	58	2	60	10,425	9,785	20,210	20,270
1963	88	8	96	10,191	7,345	17,536	17,632
1964	84	7	91	4,363	168	4,531	4,622
1965	10	-	10	9,441	300	9,741	9,751
1966	60	2	62	8,119	1,422	9,541	9,603
1967	173	3	176	7,675	184	7,859	8,035
1968	61	3	64	4,065	471	4,536	4,600
1969	59	5	64	9,494	2,904	12,398	12,462
1970	91	16	107	6,887	1,461	8,348	8,455
1971	41	32	73	10,167	9,598	19,765	19,838
1972	69	19	88	11,174	4,912	16,086	16,174
1973	139	6	145	5,024	170	5,194	5,339
1974	182	1	183	6,427	169	6,596	6,779
1975	142	1	143	4,661	129	4,790	4,933
1976	442	8	450	10,466	401	10,867	11,317
1977	182	35	217	14,277	515	14,792	15,189
1978	1,511	236	1,747	16,634	669	17,303	19,055
1979	1,199	39	1,238	12,128	1,585	13,713	14,951
1980	389	12	401	11,440	1,057	12,497	12,898
1975-1979 Avg.	695	64	759	11,633	660	12,330	13,089
1970-1979 Avg.	400	39	439	9,811	1,961	11,764	12,203
1961-1979 Avg.	244	22	266	9,151	2,629	11,775	12,041

SOURCES: ADF&G. Cook Inlet Area Annual Management Report (1961-1980).

Table 26. Reported Cook Inlet subsistence catches of chinook salmon by year, 1962-1980[1/].

Year	Number of Fish
1962	45
1963	29
1964	
1965	
1966	8
1967	4
1968	10
1969	
1970	3
1971	2
1972	1
1973	
1974	1
1975	5[c/]
1976	16[c/]
1977	2
1978	5[a/]
1979	158[a/]
1980	1,936[b/]

1/ Catches prior to 1980 derived from permit returns. Actual catches are believed to be several thousand fish each year.

SOURCES: a/ ADF&G. Cook Inlet Area Annual Management Report (1962-1980).

b/ Stanek, Ron and Dan Foster. 1980. Tyonek king salmon subsistence fishery 1980 Activities Report. ADF&G.

c/ INPFC. Statistical Yearbook (1975-1976).

Table 27. Cook Inlet chinook salmon sport catch by area and year, 1961-1980 and 1977-1979 average[1/].

	Number of Fish															
	Susitna River Drainage							Kenai Peninsula								
		Westside Drainage						Saltwater		Freshwater						
Year	Eastside Drainage	Deshka River	Lake Creek	Alexander Creek	Other	Total	Knik-Anchorage Drainage[2/]	Deep Creek	Other	Kenai River	Anchor River	Ninilchik River	Deep Creek	Other	Total	Area Total
1961	278	91	21	15		405					1,012				1,012	1,417
1962	1	142	44	33	135	355					502				502	857
1963	290	758	51	47		1,146	38				1,158				1,158	3,342
1964																
1965																
1966	4	205	26	28		263				11	290	200	50		551	814
1967	1	234	60	20		315				7	240	120	180		547	862
1968		324	3	71		398				4	250	210	160		624	1,022
1969		310	8	21		339				18	80	130	40		268	607
1970	5	579	1	286		871				237	170	280	60		747	1,618
1971	21	434	2	15		451		140		545	60	140	40		925	1,376
1972	41	299	17	92		408	57	2,250			180	170	140		2,740	3,205
1973								1,010			330	300	140		1,780	1,780
1974								600		4,910	440	350	290		6,590	6,590
1975								885		2,970	210	540	100		4,516	4,516
1976								6,877		6,031	830	630	220		14,588	14,588
1977[3/]	1,056	1,017	464	820	1,110	4,467	259	4,470	1,485	7,585	1,077	1,168	425		16,210	20,936
1978[3/]	886	850	326	769	572	3,403	140	4,800	1,317	7,130	2,109	1,445	804	251	17,856	21,399
1979	1,298	2,811	1,796	712	557	7,174	800	4,070	1,190	8,843	1,913	1,493	703	283	18,495	26,471
1980	1,370	3,685	775	1,438	1,059	7,552	672	1,636	629	4,942	605	723	182	310	9,027	17,251
1977-1979 Average[3/]	1,080	1,559	862	767	746	5,015	400	4,447	1,331	7,853	1,700	1,369	644	178	17,520	22,935

1/ Catches prior to 1977 derived from creel censuses. Catches from 1977 to 1980 derived from mail questionnaires.
2/ Primarily Little Susitna River.
3/ Catches of jacks only in Susitna River drainage.

SOURCES:
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Table 28. Upper Cook Inlet chinook salmon escapement counts, by river and year, 1961-1980[1/].

Number of Fish

	Kenai Peninsula Drainage							Westside Cook Inlet Drainage							Anchorage Area Drainage				
Year	Russian River	Kasilof River	Stariski River	Anchor River	Deep Creek	Ninilchik River	Total	Beluga River	Chuit River	Lewis River	Straight Creek	Theodore River	Other	Total	Ship Creek	Other	Total	Susitna River Total	Upper Cook Inlet Total
1961				850			850		13					13				963	1,826
1962		185	355	970	745	525	2,780		147	69		42	59	317	58	40	98	1,807	5,002
1963			265	1,340	605	450	2,660		45	5		64		114	119	322	441	1,534	4,449
1964			582	1,700	800	910	3,992	2	159					161	94	239	333	4,067	8,553
1965			330	1,600	690	1,025	3,645		1					1	207	278	485	3,844	7,975
1966				1,330	540	670	2,540		200					200	50	64	114	2,201	5,055
1967			195	1,200	270	360	2,025								200	350	550	2,678	5,253
1968	119		124	530	200	450	1,423								500	289	789	5,676	7,888
1969	150		211	1,800	960	760	3,881								710	1,112	1,822	7,384	13,087
1970	365			1,850			2,215								1,746	600	2,343	7,006	11,564
1971	170			1,220			1,390			7		79		86	221	523	744	846	3,066
1972	280			1,890	530	1,360	4,060		417					417	121	291	412	5,511	10,400
1973	347			1,660	220	640	2,867	33	149	173	5	205	374	939	165	203	368	17,625	21,799
1974	183	280		1,000	740	510	2,713		171	135		205		511	146	82	228	12,689	16,141
1975	134	343		1,290	610	830	3,207		629	75	9	95		808	120		120	8,543	12,678
1976	300	1,369		3,080	1,680	1,180	8,009	287	1,984	380	59	1,032	2	3,744	806	317	1,123	50,691	63,567
1977	182	3,194		4,170	990	1,400	9,936	1,697	1,891	454	24	2,263		6,329	1,011	662	1,673	83,005	100,943
1978	418	5,294		2,410	1,010	990	10,122	1,722	1,130	561	108	547		4,068	867	182	1,049	54,838	70,077
1979	362	3,882		2,000	1,750	1,390	9,384	206	1,246	546		512		2,510	124		124	44,613	56,631
1980	250	2,912		675	475	715	5,027												5,027

1/ Estimates are observed survey counts from combinations of ground and aerial surveys.

SOURCES: ADF&G. Inventory, cataloging and population sampling of the sport fish waters in Upper Cook Inlet. Annual Reports 1972-1980. Project F-9, (G-1-D).

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Table 29. Eastside Susitna River chinook salmon escapement counts by tributary and year, Upper Cook Inlet, 1961-1980 1/.

Number of Fish

Year	Chulitna R.	Chunilna Cr.	Montana Cr.	Prairie Cr.	Sheep Cr.	Willow Cr.	Other	Total
1961		300	65		70	170	153	758
1962		70	75	142	35	71	70	463
1963		38	23	275	24	55	39	454
1964		319	75	138		51	7	590
1965		8	57	30	3	35	3	136
1966		300	100	153	100	103	38	794
1967			2			24	6	32
1968		1,000	5			125	12	1,142
1969		375	150		150	290	150	1,115
1970		58	161	820		640	206	1,885
1971		5	44			165	52	566
1972		91	317	630	101	370	562	2,071
1973	508	537	527	7,476	926	1,074	2,018	13,066
1974	200	519	280	1,498	202	402	1,119	4,220
1975	62	101	229	369	42	177	441	1,421
1976	2,106	1,237	1,445	6,513	455	1,660	2,716	16,132
1977	2,179	769	1,443	5,790	630	1,065	2,070	13,946
1978	1,021	997	881	5,154	1,209	1,166	1,348	11,776
1979		864	1,094		778	848	1,480	5,064
1980 2/								

1/ All estimates are observed survey counts from combinations of ground and aerial surveys.

2/ Poor survey conditions precluded surveys in 1980.

SOURCES: ADF&G. Inventory and cataloging of sport fish and sport waters of the Lower Susitna River and Central Cook Inlet drainages. Annual Report (1972-1981).

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Table 30. West side Susitna River chinook salmon escapement counts by tributary and year, 1961-1980[1/].

Year	Alexander Creek	Deshka River	Lake Creek	Martin Creek	Peters Creek	Red Creek	Talachulitna River	Other	Total
	Number of Fish								
1961		11	60				32	102	205
1962	19	998	53	6	3	11	90	164	1,344
1963	750	131	46	5			56	92	1,080
1964	205	2,422	305	12			8	525	3,477
1965	416	2,749	172		101		69	201	3,708
1966	248	933	147				15	64	1,407
1967	388	1,535	723						2,646
1968	563	3,318	653						4,534
1969	663	4,836	770						6,269
1970	491	4,441	189						5,121
1971		161	119						280
1972	202	1,780	920		95		405	40	3,442
1973	875	2,381	761		59		333	150	4,559
1974	2,193	5,279	535	23	124		303	12	8,469
1975	1,878	4,737	281	6	8		120	2	7,032
1976	5,412	21,693	3,735	791	1,489	1,511		120	34,559
1977	9,246	39,642	7,391	1,060	3,042	385		1,172	64,920
1978	5,854	24,639	8,931	205	1,130			543	43,062
1979	6,214	27,385	4,196	105					39,549
1980[2/]									

1/ All estimates are observed survey counts from combinations of ground and aerial surveys.
2/ Poor survey conditions precluded surveys in 1980.

SOURCES: ADF&G. Inventory and cataloging of sport fish and sport fish waters of the Lower Susitna River and Cook Inlet drainages. Annual Report (1972-1981).
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Table 31. Sex and age composition of Montana Creek chinook salmon escapement samples, east side Susitna River, Cook Inlet, 1976-1979.

		Percent Composition					
	Number of	Sex		Age[1/]			
Year	Fish	Male	Female	1.1	1.2	1.3	1.4
1976	151	50.3	49.7		4.0	19.9	76.1
1977	156	60.3	39.7	3.2	18.6	13.5	64.7
1978	174	43.1	56.9		16.7	18.4	64.9
1979	105	48.6	51.4		12.4	14.3	73.3

1/ Age determined by length frequency analysis.

SOURCE: Watsjold, David A. Inventory and cataloging of the sport fish and sport fishing waters in Upper Cook Inlet. Annual Reports 1976-1979. Project F-9, (G-I-D).

Table 32. Sex and age composition of Willow Creek chinook salmon escapement samples, east side Susitna River, Cook Inlet, 1976-1979.

Year	Number of Fish	Percent Composition					
		Sex		Age 1/			
		Male	Female	1.1	1.2	1.3	1.4
1976	261	50.2	49.8		1.5	21.1	77.4
1977	140	42.1	57.9		2.1	9.3	88.6
1978	131	49.6	50.4		8.4	9.9	81.7
1979	215	63.3	36.7	0.4	1.4	8.4	89.8

1/ Age determined by length frequency analysis.

SOURCE: Watsjold, David A. Inventory and cataloging of the sport fish and sport fishing waters in Upper Cook Inlet. Annual Reports 1976-1979. Project F-9, (G-I-D).

Table 33. Sex and age composition of Chulitna River chinook salmon escapement samples, east side Susitna River, Cook Inlet, 1976-1979.

Year	Number of Fish	Percent Composition					
		Sex		Age 1/			
		Male	Female	1.1	1.2	1.3	1.4
1976	146	48.0	52.0		2.1	41.1	56.8
1977	255	43.1	56.9	0.4	5.9	40.8	52.9
1978	152	48.7	51.3		19.7	46.7	33.6

1/ Age determined by length frequency analysis.

SOURCE: Watsjold, David A. Inventory and cataloging of the sport fish and sport fishing waters in Upper Cook Inlet. Annual Reports 1976-1979. Project F-9, (G-I-D).

Table 34. Sex and age composition of Prarie Creek chinook salmon escapement samples, east side Susitna River, Cook Inlet area, 1976.

Year	Number of Fish	Percent Composition					
		Sex		Age 1/			
		Male	Female	1.1	1.2	1.3	1.4
1976	339	51.9	48.1	1.2	26.3	23.0	49.5

1/ Age determined by length frequency analysis.

SOURCE: Watsjold, David A. Inventory and cataloging of the sport fish and sport fishing waters in Upper Cook Inlet. Annual Reports 1976-1979. Project F-9 (G-I-D).

Table 35. Sex and age composition of Deception Creek chinook salmon escapement samples, east side Susitna River, Cook Inlet area, 1978.

		Percent Composition					
	Number of	Sex		Age[1/]			
Year	Fish	Male	Female	1.1	1.2	1.3	1.4
1978	126	69.8	30.2		11.9	21.4	66.7

1/ Age determined by length frequency analysis.

SOURCE: Watsjold, David A. Inventory and cataloging of the sport fish and sport fishing waters in Upper Cook Inlet. Annual Reports 1976-1979. Project F-9, (G-I-D).

Table 36. Age composition of Kenai Peninsula chinook salmon sport catch samples, Cook Inlet area, 1974-1980.

		Percent Composition					
		Age					
Year	Number of Fish	1.1	1.2	1.3	1.4	1.5	Other
1974	87	1.1	5.8	4.6	81.6	5.8	1.1
1975	376	29.2	31.4	22.9	14.1	2.1	0.3
1976	511	8.0	26.8	20.6	40.9	3.1	0.6
1977	380		12.9	35.0	49.0	1.6	1.6
1978	244		13.5	11.1	74.2	1.2	
1979	177	9.6	25.4	53.1	11.9		
1980	501	15.7	18.6	58.7	7.0		

SOURCE: Hammerstrom, Stephen L. Evaluation of the chinook salmon fisheries of the Kenai Peninsula. Annual Reports 1974-1975. Project F-9 (G-I-C).

Table 37. Age composition of Anchor River, Ninilchik River, and Deep Creek chinook salmon sport catch samples, Kenai Peninsula, Cook Inlet area, 1974-1980.

		Percent Composition					
		Age					
Year	Number of Fish	1.1	1.2	1.3	1.4	1.5	Other
1973	228	0.4	3.5	19.7	68.9	5.3	2.2
1974	159		31.4	20.1	44.7	0.6	3.2
1975							
1976	320	0.9	16.6	36.9	45.3	0.3	
1977	370		10.6	60.8	28.1	0.5	
1978	651	0.3	15.3	27.2	56.4		0.8
1979	466		6.4	42.9	49.2	0.9	0.6
1980	250		11.2	45.2	43.6		

SOURCE: Hammerstrom, Stephen L. Evaluation of the chinook salmon fisheries of the Kenai Peninsula. Annual Reports 1974-1980. Project F-9, G-II-L.

Hammerstrom, Stephen L. Inventory and cataloging of the lower Kenai Peninsula fish stocks. Annual Report 1974-1975. Project F-9, 15 (G-II-C).

Table 38. Age composition of Deep Creek chinook salmon marine sport catch samples, Kenai Peninsula, Cook Inlet area, 1974-1980.

Year	Number of Fish	Percent Composition					
		Age					
		1.1	1.2	1.3	1.4	1.5	Other
1974	246	0.4	22.4	14.6	57.7	2.4	2.4
1975							
1976	342		8.8	15.8	69.0	3.8	2.6
1977	257		8.6	38.1	50.6	2.0	0.8
1978	210		4.8	22.9	69.5	2.9	
1979	145		2.8	18.6	67.6	11.0	
1980	54		1.9	16.7	72.2	9.3	

SOURCE: Hammerstrom, Stephen L. Evaluation of the chinook salmon fisheries of the Kenai Peninsula. Annual Reports 1977-1980. Project F-9, (G-II-L).

Table 39. Age composition of Deep Creek chinook salmon freshwater sport catch samples, Kenai Peninsula, Cook Inlet area, 1967-1980.

		Percent Composition						
		Age						
Year	Number of Fish	1.1	1.2	1.3	1.4	2.2	2.3	Other
1967	107	6.5	21.6	29.0	35.6			6.4
1968	105	2.9	32.4	32.4	26.7			5.6
1969	28		78.6	17.8	3.6			
1970	15		20.0	46.7	33.3			
1971								
1972								
1973								
1974								
1975								
1976								
1977								
1978	240		15.4	29.2	55.4			
1979								
1980	8			25.0	75.0			

SOURCE: ADF&G. Evaluation of the chinook salmon fisheries of the Kenai Peninsula. Annual Reports 1967-1980. Project F-9 (G-II-L).

Watsjold, David A. Population studies of anadromous fish populations in southwestern Kenai Peninsula and Kachemak Bay. Annual Reports 1967-1969.

Nelson, D.C. 1970. Population studies of anadromous fish populations - southwestern Kenai Peninsula and Kachemak Bay. Annual Report. Project F-9, (G-II-C).

Table 40. Sex and age composition of Willow Creek chinook salmon sport catch samples, east side Susitna River, Cook Inlet area, 1979-1980.

				Percent Composition						
	Number of	Sex		Age[1/]						
Year	Fish	Male	Females	1.2	1.3	1.4	1.5	2.2	2.3	Other
1979[1/]	152	67.1	32.9	11.2	14.5	74.3				
1979[2/]	152	67.1	32.9	11.2	18.4	69.1	1.3			
1980[1/]	105			29.5	16.2	54.3				
1980[1/]	105			25.7	16.2	51.4	4.8	1.9		

1/ Age determined by length frequency analysis.
2/ Age determined by scale analysis.

SOURCE: Watsjold, David A. Inventory and cataloging of the sport fish and sport fishing waters in Upper Cook Inlet. Annual Reports 1976-1980. Project F-9, (G-I-D).

Table 41. Sex and age composition of Montana Creek chinook salmon sport catch samples, east side Susitna River, Cook Inlet area, 1979-1980.

				Percent Composition						
		Sex		Age[1/]						
Year	Number of Fish	Male	Female	1.2	1.3	1.4	1.5	2.2	2.3	Other
1979[1/]	35	55.9	44.1	14.3	22.9	62.8				
1979[2/]	35	55.9	44.1	14.3	25.7	60.0				
1980[1/]	199			44.2	25.6	30.2				
1980[2/]	199			42.2	24.6	30.7	1.0	1.5		

1/ Age determined by length frequency analysis.

2/ Age determined by scale analysis.

SOURCE: Watsjold, David A. Inventory and cataloging of the sport fish and sport fishing waters in Upper Cook Inlet. Annual Reports 1976-1980. Project F-9, (G-I-D).

Table 42. Age composition of Little Susitna River chinook salmon sport catch samples, east side Susitna River, Cook Inlet area, 1979-1980.

Year	Number of Fish	Percent Composition Age[1/] 1.2	1.3	1.4	1.5	2.3	2.4	Other
1979[1/]	232	12.5	16.0	71.5				
1979[2/]	232	12.9	20.7	64.7	0.9	0.4	0.4	
1980[1/]	90	10.0	31.1	58.9				
1980[2/]		10.0	46.7	41.1	2.2			

1/ Age determined by length frequency analysis.
2/ Age determined by scale analysis.

SOURCE: Watsjold, David A. Inventory and cataloging of the sport fish and sport fishing waters in Upper Cook Inlet. Annual Reports 1976-1980. Project F-9, (G-I-D).

Table 43. Age composition of Chunilna Creek chinook salmon sport catch samples, east side Susitna River, Cook Inlet area, 1979-1980.

Year	Number of Fish	Percent Composition						
		Age[1/]						
		1.2	1.3	1.4	1.5	2.2	2.4	Other
1979[1/]	152	17.1	30.9	52.0				
1979[2/]	152	17.1	41.4	38.2	2.6		0.7	
1980[1/]	74	43.2	20.3	36.5				
1980[2/]	74	41.9	24.3	32.4		1.4		

1/ Age determined by length frequency analysis.
2/ Age determined by scale analysis.

SOURCE: Watsjold, David A. Inventory and cataloging of the sport fish and sport fishing waters in Upper Cook Inlet. Annual Reports 1976-1980. Project F-9, (G-I-D).

Table 44. Age composition of Caswell Creek chinook salmon sport catch samples, east side Susitna River, Cook Inlet area, 1979-1980.

Year	Number of Fish	Percent Composition Age[1/] 1.2	1.3	1.4	1.5	2.2	2.3	Other
1979[1/]	56	50.0	19.6	30.4				
1979[2/]	56	50.0	21.4	28.6				
1980[1/]	169	46.1	22.5	31.4				
1980[2/]	169	46.1	23.1	29.0		1.8		

1/ Age determined by length frequency analysis.
2/ Age determined by scale analysis.

SOURCE: Watsjold, David A. Inventory and cataloging of the sport fish and sport fishing waters in Upper Cook Inlet. Annual Reports 1976-1980. Project F-9, (G-I-D).

Table 45. Sex and age composition of Ninilchik River chinook salmon sport catch samples, Kenai Peninsula, Cook Inlet area, 1966-1980.

		Percent Composition							
	Number of	Sex		Age					
Year	Fish	Male	Female	1.1	1.2	1.3	1.4	1.5	Other
1966	82				22.0	45.2	30.4		2.2
1967	78			2.6	6.4	30.8	56.3	1.3	2.6
1968	100			4.0	42.0	21.0	30.0		3.0
1969	64				34.4	50.0	12.5		3.1
1970	100	50.0	50.0		18.0	54.0	28.0		
1971	35				8.6	34.3	57.1		
1972									
1973									
1974									
1975									
1976									
1977									
1978	89				28.1	21.4	50.6		
1979									
1980	161				9.3	50.9	39.8		

SOURCE: ADF&G: Evaluation of the chinook salmon fisheries of the Kenai Peninsula Annual Reports 1977-1980. Project F-9, (G-II-L).

Table 46. Sex and age composition of Anchor River chinook salmon sport catch samples, Kenai Peninsula, Cook Inlet area, 1961-1980.

		Percent Composition							
	Number of	Sex		Age					
Year	Fish	Male	Female	1.1	1.2	1.3	1.4	1.5	Other
1961	112	54.2	45.8	2.9	10.6	21.1	64.4		1.0
1962	47	43.7	56.3		31.9	40.4	27.7		
1963	99	50.7	49.3	10.1	19.2	49.5	20.2		1.0
1964									
1965									
1966	151	45.4	54.6	2.6	19.2	42.4	30.5		5.3
1967	112	41.8	58.2	1.8	8.9	22.3	66.1		0.9
1968	168	56.6	43.5	0.6	20.8	31.0	46.4		1.2
1969	36	58.0	42.0	2.8	47.2	38.9	11.1		
1970	54	47.7	52.3		18.3	54.4	27.3		
1971									
1972									
1973									
1974									
1975									
1976									
1977									
1978	302				10.9	27.8	61.3		
1979									
1980	102				12.8	48.0	39.2		

SOURCE: Hammerstrom, Stephen L. Evaluation of the chinook salmon fisheries of the Kenai Peninsula. Annual Reports 1977-1980. Project F-9, G-II-L.

ADF&G. Evaluation of the chinook salmon fisheries of the Kenai Peninsula. Annual Reports 1961-1980. Project F-5-R, (7-B-12).

Table 47. Age composition of Crooked Creek hatchery chinook salmon escapement, Kenai Peninsula, Cook Inlet area, 1976-1980[1/].

Year	Number of Fish	Percent Composition			
		Ocean Age[2/]			
		I	II	III	IV
1976	955	0.6	5.3	18.2	75.8
1977	543	7.7	23.9	34.4	33.9
1978	915	47.9	37.8	50.5	32.4
1979	841	8.0	10.0	54.0	28.0
1980	523	10.0	23.0	39.0	28.0

1/ Both wild and hatchery fish are included.

2/ Hatchery fish have no freshwater annulus, wild stocks all exhibit one freshwater winter annulus.

SOURCE: Waite, David C. 1979. Chinook enhancement on the Kenai Peninsula. Completion Report 1979. Project AFS-46-1.

WESTWARD REGION

The Westward Region includes all coastal waters and inland drainages from Cape Douglas to Cape Menshikof, Kodiak Island and neighboring islands, and the Aleutians (Figure 5). The Region is divided into three management areas: Kodiak, Chignik, and Alaska Peninsula-Aleutian Islands. The most productive chinook salmon spawning streams in this area are the Karluk River and Ayakulik (Red) River on Kodiak Island; and the Meshik, and Chignik Rivers and smaller streams emptying into Nelson Lagoon on the northside of the Alaska Peninsula. The Region's chinook production is small in comparison to that of other areas in the State, supporting only minor commercial, subsistence, and sport catches.

Most chinook salmon taken in the Region are incidental to directed commercial seine and gill net chum, sockeye, and pink salmon fisheries. Small directed chinook net fisheries do occur, however, at Port Heiden and Nelson Lagoon (Table 48). Although commercial harvests were relatively stable from 1961 through 1977, at about 8,000 fish, chinook catches dramatically increased in 1978 (19,800 fish) and 1979 (22,400 fish; Table 49). Because of the incidental character of most of these fisheries, it is difficult to determine if these increased catches reflect increased chinook salmon returns or are a result of the more liberal fishing times allowed recently for other species. However, it is believed that westward chinook salmon runs, particularly on the north side of the Alaska Peninsula, have participated in the trend toward increased run sizes observed in other western Alaska systems in recent years.

Sport fishermen have harvested an average of 850 chinook salmon annually since 1977 (Table 51). Subsistence catches are not well documented but estimated harvests ranged from 0 to 1,800 fish from 1979 through 1978 (Table 50). Most of these catch estimates are believed to be minimal.

Escapement of chinook salmon in the Westward Region has been monitored at weirs on the Karluk, Ayakulik, and Chignik Rivers, and by aerial survey on streams of the Alaska Peninsula (Table 52). Aerial survey counts, with assumed exploitation rates, have been used to calculate total escapement estimates for many spawning streams on the Peninsula; however, these estimates have not been rigorously examined and their accuracy is unknown. No significant spawning is known to occur on the south side of the Alaska Peninsula (except for the Chignik River) or in the Aleutian Islands. Total escapement estimates for the Region averaged 24,000 fish during the 4-year period beginning in 1976. Increased escapement estimates since 1978 suggest that chinook salmon production in this region may have surpassed historic levels.

Age composition estimates from the Karluk, Frazer, Chignik, and Ayakulik Rivers, although limited, indicates that four-ocean fish are the dominant age class (Tables 53-55).

About 25,000 chinook salmon were harvested in the Westward Region in 1980. The majority (24,000 fish) were taken in the various commercial fisheries, with approximately 90% of these harvested in north Peninsula waters, primarily Nelson Lagoon (8,700 fish), and Port Heiden (5,400). Commercial harvests were well above all 5, 10, and 19-year averages for every area except Kodiak Island. The

Kodiak commercial catch (530 chinook) was the third lowest since 1961, while the Nelson Lagoon and south Peninsula harvests were the highest recorded from 1961 onward.

The subsistence harvest in 1980 on Kodiak Island (70 fish) appeared to be average. The sport harvest for the entire region (670 fish) was somewhat below the 1977-1979 average of 850 fish.

Total chinook escapement during 1980 for the Westward Region was estimated at 17,700 fish. The majority of this escapement (11,000 fish) was to north Peninsula systems. Escapements in most north Peninsula streams continued the trend of increased returns begun in 1978.

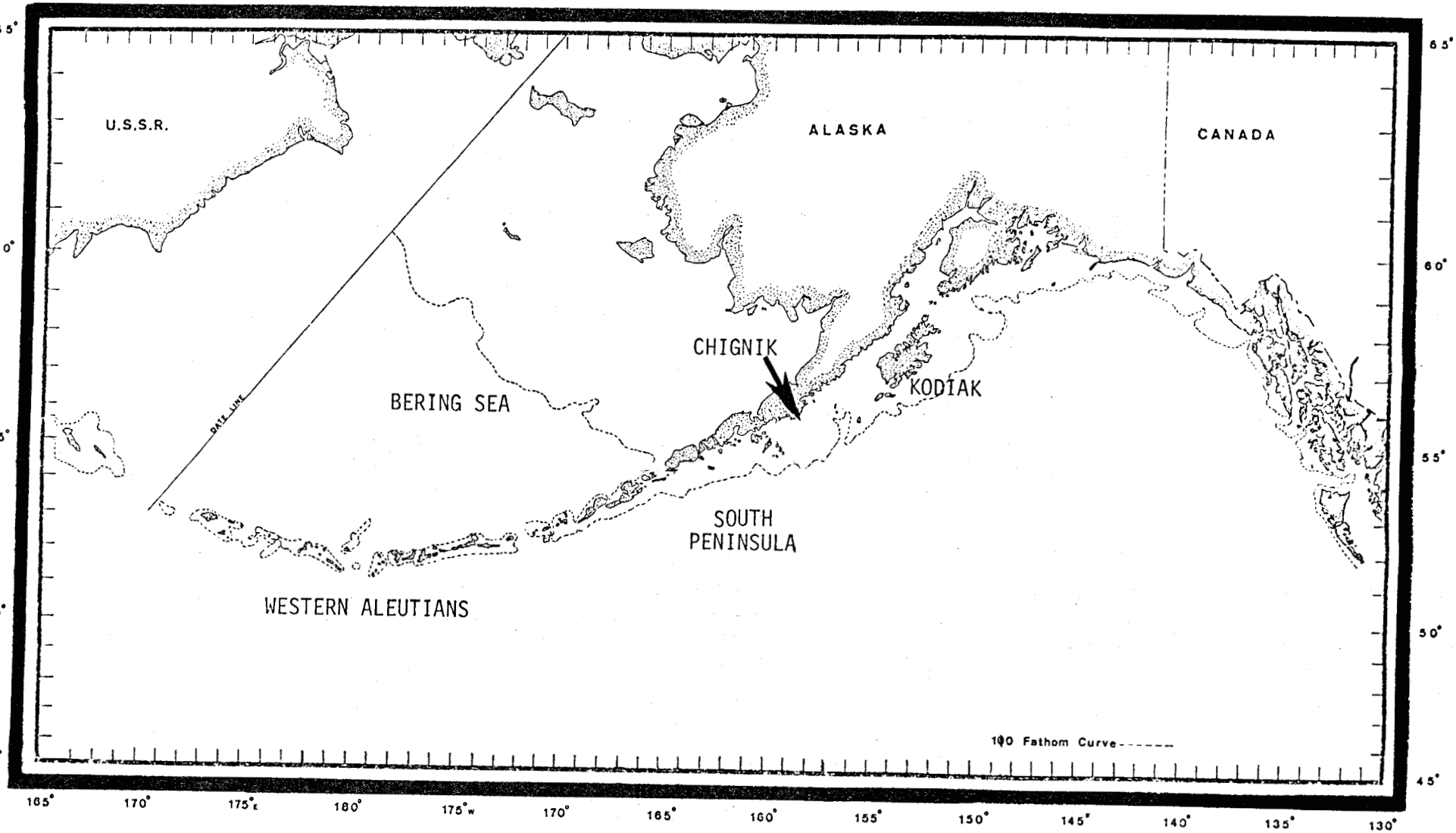

Figure 5. Management districts of the Westward Region, Alaska.

Table 48. Alaska Peninsula commercial chinook salmon catches and escapement estimates by area and year, and selected period averages, 1961-1980.

Number of Fish

	NORTH PENINSULA															SOUTH PENINSULA			TOTAL		
	Nelson Lagoon			Port Heiden			Bear River			Other 3/			Total North Peninsula								
YEAR	Catch	Escapement	Total	Catch	Escapement	Total	Catch	Escapement	Total	Catch	Escapement	Total	Catch	Escapement	Total	Catch	Escapement	Total	Catch	Escapement	Total
1961	3,700	300	4,000										6,100			900	0	900	7,000		
1962	3,700	2,700	6,400	400	1,100 2/	1,500	500	500	1,000	800	100	900	5,400	4,400	9,800	3,300	0	3,300	8,700	4,400	13,100
1963	2,500	4,000	6,500	0	100 2/	100	600	200	800	500	1,900	2,400	3,600	6,200	9,800	1,900	0	1,900	5,500	6,200	11,700
1964	3,300	8,400	11,700	0	4,200	4,200	300	3,000	3,300	0	10,300	10,300	3,600	25,900	29,500	2,000	0	2,000	5,600	25,900	31,500
1965	4,000	11,900	15,900	1,900	1,000	2,900	100	5,400	5,500	100	3,800	3,900	6,100	22,100	28,200	2,100	0	2,100	8,200	22,100	30,300
1966	2,400	4,700	7,100	700	1,300 2/	2,000	100	300 2/	400	2,400	1,900	4,300	5,600	8,200	13,800	1,400	0	1,400	7,000	8,200	15,200
1967	3,600	5,100	8,700	1,400	500	1,900	100	3,000	3,100	400	3,600	4,000	5,500	12,200	17,700	1,600	0	1,600	7,100	12,200	19,300
1968	2,800	7,300	10,100	1,000	1,100 2/	2,100	300	2,600	2,900	400	4,800	5,200	4,500	15,800	20,300	1,400	0	1,400	5,900	15,800	21,700
1969	2,500	8,100	10,600	1,400	1,100 2/	2,500	500	1,000	1,500	400	9,300	9,700	4,800	19,500	24,300	1,900	0	1,900	6,700	19,500	26,200
1970	2,600	2,900	5,500	0	300	300	200	1,000	1,200	400	4,100	4,500	3,200	8,300	11,500	1,800	0	1,800	5,000	8,300	13,300
1971	1,400	2,300	3,700	0	100	100	300	800	1,100	500	2,000	2,500	2,200	5,200	7,400	2,200	0	2,200	4,400	5,200	9,600
1972	1,300	1,400	2,700	0	1,600	1,600	200	100	300	300	1,900	2,200	1,800	5,000	6,800	1,300	0	1,300	3,100	5,000	8,100
1973	1,500	1,500	3,000	1,600	600	2,200	700	100	800	600	2,100	2,700	4,400	4,300	8,700	400	0	400	4,800	4,300	9,100
1974	2,100	1,100	3,200	2,500	700	3,200	200	300	500	300	900	1,200	5,100	3,000	8,100	500	0	500	5,600	3,000	8,600
1975	1,200	2,500	3,700	400	900	1,300	300	700	1,000	200	500	700	2,100	4,600	6,700	100	0	100	2,200	4,600	6,800
1976	2,200	3,300	5,500	1,500	200	1,700	500	500	1,000	700	2,000	2,700	4,900	6,000	10,900	2,100	0	2,100	7,000	6,000	13,000
1977	1,700	5,600	7,300	2,500	700	3,200	700	0	700	600	800	1,400	5,500	7,100	12,600	500	0	500	6,000	7,100	13,100
1978	3,400	4,200	7,600	9,500	4,200	13,700	600	200 2/	800	700	5,100	5,800	14,200	13,700	27,900	800	0	800	15,000	13,700	28,700
1979	5,400	11,000	16,400	9,700	3,200 2/	12,900	1,400	0	1,400	600	1,600	2,200	17,100	15,800	32,900	2,100	0	2,100	19,200	15,800	35,000
1980	8,700	5,500	14,200	5,400	1,600 2/	7,000	1,700	100	1,800	1,000	3,800	4,800	16,800	11,000	27,800	4,800	0	4,800	21,600	11,000	32,600
1976-1979 Avg.	2,780	5,320	8,100	4,720	1,840	6,560	700	280	980	560	2,000	2,560	8,760	9,440	18,200	1,120		1,120	9,880	9,440	19,320
1971-1979 Avg.	2,280	3,580	5,860	2,770	1,250	4,020	510	370	880	490	2,100	2,590	6,050	7,300	13,350	1,180		1,180	7,230	7,300	14,530
1961-1979 Avg.	2,700	4,647	7,347	1,917	1,272	3,189	422	1,094	1,517	550	3,150	3,700	5,563	10,406	15,939	1,572		1,572	7,053	10,406	17,461

1/ Estimates derived from aerial surveys.
2/ Subjective estimates by source authors.
3/ Primarily: Herendeen/Moller Bay catches; Cinder River and Caribou Flats/Black Hills escapements.

SOURCE: ADF&G. Alaska Peninsula-Aleutian Islands Area Annual Report (1961-1980).

Table 49. Westward Region chinook salmon catch by management area and year, and selected period averages, 1961-1980.

	Number of Fish			
Year	Kodiak a/	Chignik b/	Alaska Peninsula c/	Region Total
1961	864	409	7,000	8,273
1962	1,095	435	8,700	10,230
1963	286	1,744	5,500	7,530
1964	1,302	1,099	5,600	8,001
1965	786	1,592	8,200	10,578
1966	593	636	7,000	8,229
1967	962	882	7,100	8,944
1968	1,936	674	5,900	8,510
1969	2,241	3,448	6,700	12,389
1970	1,089	1,225	5,000	7,314
1971	920	2,010	4,400	7,330
1972	1,300	464	3,100	4,864
1973	800	525	4,800	6,125
1974	542	255	5,600	6,397
1975	101	549	2,200	2,850
1976	766	763	7,000	8,529
1977	585	711	6,000	7,296
1978	3,228	1,603	15,000	19,831
1979	1,905	1,266	19,200	22,371
1980	529	2,325	21,600	24,454
1975-1979 Avg.	1,317	978	9,880	12,175
1970-1979 Avg.	1,124	937	7,230	9,291
1961-1979 Avg.	1,121	1,068	7,053	9,242

SOURCE: a: ADF&G. Kodiak Management Area Finfish Annual Report (1961-1980).
b: ADF&G. Chignik Management Area Finfish Annual Report (1961-1981).
c: ADF&G. Alaska Peninsula-Aleutian Islands Area Annual Report (1961-1980).

Table 50. Westward Region subsistence chinook salmon catch estimates by management area and year, and selected period averages, 1961-1980.

	Number of Fish			
Year	Kodiak	North Alaska Peninsula	South Alaska Peninsula	Chignik
1961				
1962	0			
1963	0			
1964	6			
1965	2			
1966	0			
1967	2			
1968	0			
1969	1			
1970	1	500	250	
1971	5	250 1/	100 1/	50 2/
1972	11	100 1/	1,806 1/	100 2/
1973	7	200 1/	100 1/	
1974	1	136 1/		100 1/
1975	1	106	4	100
1976	4			100
1977	54	15 1/	7 1/	50
1978	50			
1979	111			
1980	67			
1975-1979 Avg.	44			
1970-1979 Avg.	25			
1962-1979 Avg.	14			

1/ Estimated total subsistence harvest extrapolated from limited permit returns.

2/ Incomplete estimates.

SOURCE: ADF&G. 1980. Kodiak Management Area Finfish Annual Report (1961-1980).

INPFC. Statistical Yearbook (1970-1977).

Table 51. Westward Region sport chinook salmon catch estimates by fishery and year, and 1977-1979 average, 1965-1980.

	Number of Fish							
	Creel Census a/			Postal Survey b/				
	Kodiak			Kodiak			Alaska Peninsula and Aleutian Islands 2/	
Year	Karluk River	Ayakulik River	Total	Saltwater	Freshwater	Total		Total
1965	70 3/							
1966								
1967								
1968	150 3/							
1969								
1970								
1971								
1972	179 4/		179					
1973	200 5/							
1974	57 3/	30	87					
1975	265		265 2/					
1976	89 6/	25	114					
1977	374 7/		374	34	449	483	400	883
1978	398 7/	9	407	12	338	350	221	571
1979	139 6/		139	98	654	752	346	1,098
1980	194 6/	4	198	60	267	327	344	671
1977-1979 Avg.	304	6	248	48	480	528	322	850

1/ Includes catches from all waters from Cape Douglas to the village of Naknek, excluding the Naknek River. Note: These estimates are also included in Bristol Bay sport catches.

2/ Island-wide estimated catch of 317 from postal survey.

3/ Harvest from Karluk Portage area only, based on logbook reports.
4/ Harvest from Karluk Portage area only, based on creel census.
5/ Harvest estimate based on cursory observations of the fishery.
6/ Harvest from lagoon area only, based on creel census.
7/ Harvest from entire river.

SOURCE: a: Van Hulle, Frank and John B. Murray. Inventory and cataloging of the sport fish and sport fish waters of southwestern Alaska. Annual Reports 1971-1981. Project F-9, (G-I-B).

b: Mills, Michael J. Statewide Harvest Study. Annual Reports 1977-1981. Project SW-I.

Table 52. Westward Region chinook salmon escapement estimates by area and year, 1962-1980.

	Number of Fish						
	Kodiak Area						
Year	Karluk River	Ayakulik River 1/	Frazer River	Total	Chignik River 1/ 3/	Peninsula 7/	Total
1962						4,400	
1963					564	6,200	
1964					914	25,900	
1965	978 4/			978	942	22,100	
1966	5/				822	8,200	
1967	1,500 1/ 4/ 6/ 8/	80 4/		1,580	1,500	12,200	
1968	700 1/ 4/ 8/		3	703	1,000	15,800	
1969	1,750 1/ 4/ 8/		2	1,752	600	19,500	
1970	3,900 4/			3,900	2,500	8,300	
1971	4,500 5/		24	4,524	2,000	5,200	
1972	1,290 4/	1,644	113	3,047	1,500	5,000	
1973	3,500 6/	1,262		4,762	822	4,300	
1974	700 5/	851	0	1,551	672	3,000	
1975	2,000 5/	1,053	6	3,059	877	4,600	
1976	6,897 1/	1,493	21	8,411	700	6,000	15,111
1977	8,436 1/	5,163	205	13,804	798	7,100	21,702
1978	9,795 1/	4,739	143	14,677	1,197	13,700	29,575
1979	9,555 1/	4,833	53	14,441	1,050	15,800	31,291
1980	4,810 1/	974	66	5,850	876	11,000	17,726

1/ Weir.
2/ Fishpass. Frazer River run was introduced following construction of pass.
3/ Only large chinook are recorded due to difficulty in distinguishing small chinooks from sockeye as they pass through the Chignik weir.
4/ Aerial survey.
5/ Ground survey.
6/ Undesignated survey type.
7/ Total escapement estimates based on aerial surveys.
8/ Incomplete estimate.

SOURCES: ADF&G. 1980. Kodiak Management Area. Finfish Annual Report (1976-1980).

Van Hulle, Frank and John B. Murray. Inventory and cataloging of the sport fish and sport fish waters in southwestern Alaska. Annual Reports (1969-1981).

ADF&G. 1981. Chignik Management Area Finfish Annual Report (1963-1981).

Marriott, Richard A. Inventory and cataloging of the sport fish waters of southwest Alaska. Annual Reports (1965-1968).

ADF&G. Alaska Peninsula-Aleutian Islands Area Annual Report (1961-1980).

Table 53. Sex and age composition of Kodiak Island chinook salmon samples by year, Westward Region, 1972-1976.

Year	Location	Number of fish	Sex (%)		Age (%)							
			Male	Female	1.1	1.2	1.3	1.4	1.5	2.3	2.4	2.5
1972	Ayakulik River 1/	98	52.0	48.0			8.2	56.1	10.2	2.0	20.4	3.1
1972	Frazer Lake 2/	43	16.3	83.7			11.6	86.1			2.3	
1972	Chignik River 3/	30	10.0	90.0				30.0		6.7	63.3	
1973												
1974												
1975												
1976	Ayakulik Lagoon 4/	22	72.7	27.3	27.3	9.1	31.8	31.8				
1976	Frazer River 2/	7	85.7	14.3			100.0					

1/ Weir.
2/ Fishpass.
3/ Egg take.
4/ Undesignated sample source.

SOURCE: Van Hulle, Frank and John B. Murray. Inventory and cataloging of the sport fish and sport fish waters of southwestern Alaska. Annual Reports 1972-1981. Project F-9, (G-I-B).

Table 54. Sex and age composition of Karluk Lagoon and Lake chinook salmon samples by year, Kodiak Island, Westward Region, 1972-1980.

Year	Number of Fish	Percent Composition												
		Sex		Age										
		Male	Female	0.1	1.1	1.2	1.3	1.4	1.5	2.1	2.2	2.3	2.4	2.5
1972 1/	64	51.6	48.4			3.1		1.6		7.8		17.2	65.6	1.6
2/	29	55.2	44.8				6.9	3.5				13.8	75.9	
3/	129	56.6	43.4				0.8	6.2		3.1	4.7	13.2	69.8	2.3
1973														
1974														
1975 4/	93	64.9	35.1	1.1	4.3	27.2	23.9	34.8	1.1	1.1		1.1	5.4	
1976 4/	115	73.0	27.0			12.2	47.0	40.9						
1977 3/	231	41.6	58.4	1.7	3.0	7.4	39.4	48.5						
1978 5/	231	40.3	59.7		0.4	1.3	24.2	72.3	1.8					
1979 3/	217	40.1	59.9		0.5	1.4	24.0	72.4	1.8					
1980 3/	80	50.0	50.0			6.2	18.8	50.0	12.5					

1/ Lagoon tagging sample.
2/ Subsistence catch.
3/ Sport fish catch.
4/ Undesignated sample source.
5/ Weir and sport catch.

SOURCE: Van Hulle, Frank and John B. Murray. Inventory and cataloging of the sport fish and sport fish waters in southwestern Alaska. Annual Reports 1969-1981). Project F-9, (G-I-B).

Table 55. Age, sex, and size composition of Karluk River sport chinook salmon catch samples, Kodiak Island, 1980.

Sample Period	Sex		Age 1.2	1.3	1.4	1.5	2.2	2.3	2.4	Total
	Male	Number	3	15	13	4		2	3	40
		Percent	3.8	18.8	16.3	5.0		2.5	3.8	50.0
		Avg. length	622	753	864	940		689	839	801
	Female	Number	2		27	6	1	2	2	40
		Percent	2.5		33.8	7.5	1.2	2.5	2.5	50.0
		Avg. length	655		885	920	558	762	824	841.1
	Combined	Number	5	15	40	10	1	4	5	80
		Percent	6.2	18.8	50.0	12.5	1.2	5.0	6.2	100.0
		Avg. length	635	753	878	928	558	726	833	821

SOURCE: Van Hulle, Frank and John B. Murray. 1981. Inventory and cataloging of the sport fish and sport fish waters in southwestern Alaska. Annual Report. 1980-1981, Project F-9-13, (G-I-B).

BRISTOL BAY

The Bristol Bay area includes all coastal waters and inland drainages east of the line from Cape Newenham to Cape Menshikof. Major features of the area include the Togiak, Nushagak, Kvichak, Egegik, and Ugashik Bays and their associated river systems (Figure 6). Although Bristol Bay is primarily known for its bountiful sockeye salmon harvests (the largest in the world), it is also a major producer of chinook salmon in Alaska and supports commercial, subsistence, and sport harvests of this species. Most chinook salmon in the Bristol Bay area spawn in the Nushagak River system although significant chinook salmon populations are also found in the Togiak and Naknek River systems.

Chinook salmon returns to the Nushagak and Togiak River systems have been estimated since 1967. Through 1980, estimated total chinook return to the Nushagak and Togiak Districts ranged from about 94,000 fish in 1973 to 350,000 fish in 1978 (Table 56). Estimated total return dropped from a range of 150,000 to 190,000 fish during the late 1960's to a lower range of 90,000 to 140,000 fish during the early 1970's. Returns have greatly increased since 1976 to range from 212,000 to 350,000 fish. Although escapement estimates are not available for the smaller chinook salmon producing systems, it is probable that total returns to Bristol Bay have averaged about 300,000 fish since 1976.

Most of the chinook salmon harvested in Bristol Bay are commercially taken in directed gill net fisheries (8-1/2 inch mesh) in the Nushagak (1961-1979 average 73,000 fish; Table 57) and Togiak (1961-1979 average 19,000 fish) districts before the larger sockeye salmon fisheries. Smaller commercial catches, primarily incidental to sockeye fisheries are made in other districts. Nushagak District chinook harvests were depressed in 1973, 1974, and 1975, but record catches of 119,000 and 155,000 fish were made in 1978 and 1979. Regulation of the directed fishery in the Nushagak and Togiak Districts is accomplished by scheduled weekly fishing periods of 5 days per week. Fishing time is further restricted when escapements, primarily assessed through subsistence catches, are judged inadequate. Effort in the Nushagak District steadily increased from 150 units in 1974 to 430 units in 1979. The dominant age class in Nushagak commercial catches has been age 1.4 fish (Tables 63-65).

Subsistence catches of chinook salmon have remained relatively stable (the 1961-1979 average was 6,600 fish; Table 58). Most of the subsistence harvest takes place in the Nushagak River system (1961-1979 average 5,700 fish). Sport catches have also remained relatively stable (1977-1979 average 3,300 fish; Table 59). Sport fishing centers on the Naknek River (1977-1979 average catch 2,000 fish; Table 59), although significant harvests are also taken from the Nushagak River system (1977-1979 average 670 fish). Sport fishing effort, particularly on the Nushagak River, appears to have increased considerably in recent years.

Escapement estimates to the largest chinook salmon producing systems are mostly obtained from aerial surveys (Tables 60-62). Actual counts of fish are expanded to provide total escapement estimates. Expansion factors and methodology vary and have not been rigorously examined. Considerations in expanding aerial counts include differential survey conditions, trends in distribution, expected

proportions of fish actually seen from the air (derived from aerial surveillance of known numbers of sockeye salmon), and assumed levels of commercial exploitation. An attempt is made to obtain escapement of from 50,000 to 60,000 fish in the Nushagak River system. Nushagak River escapement has also been estimated with side-scanning sonar since 1979. However, it is felt that the sonar counts underestimate actual escapement. The age, sex, and size composition of chinook escapements in the Bristol Bay area has not been studied.

Total chinook salmon return to the Nushagak and Togiak Districts in 1980 was estimated at more than 240,000 fish (Table 56). This return is the third largest estimated since 1966.

A total of 114,000 chinook salmon were harvested in the Bristol Bay area in 1980. The majority (64,000 fish) were commercially taken in the Nushagak District (Table 57). Effort again increased in 1980 to 537 units. Age analysis of catch samples indicated a high proportion (71%) of 4 and 5-year fish compared to the smaller historical average of approximately 40%. Final summaries of the 1980 age composition have not been completed. Escapement, as gauged by subsistence catches, was judged less than adequate, prompting a one-week closure in mid-June. Remaining fishing effort for chinook salmon was limited when price agreements between fishermen and processors were delayed. The Togiak District commercial catch of 12,000 chinook was far below the 1975-1979 average of 32,000.

A record subsistence catch of 14,000 fish was harvested during 1980; primarily in the Nushagak River system (12,000 fish). A record sport catch of 4,200 fish was also harvested. Most of these fish were taken in the Naknek River.

Aerial survey counts indicated a record escapement to the Nushagak River system (141,000 fish) and an average escapement to the Togiak River system (12,000 fish). Record escapements were observed in the King Salmon (4,500 fish), Stuyahok (7,200 fish), and Koktuli (10,300 fish) Rivers.

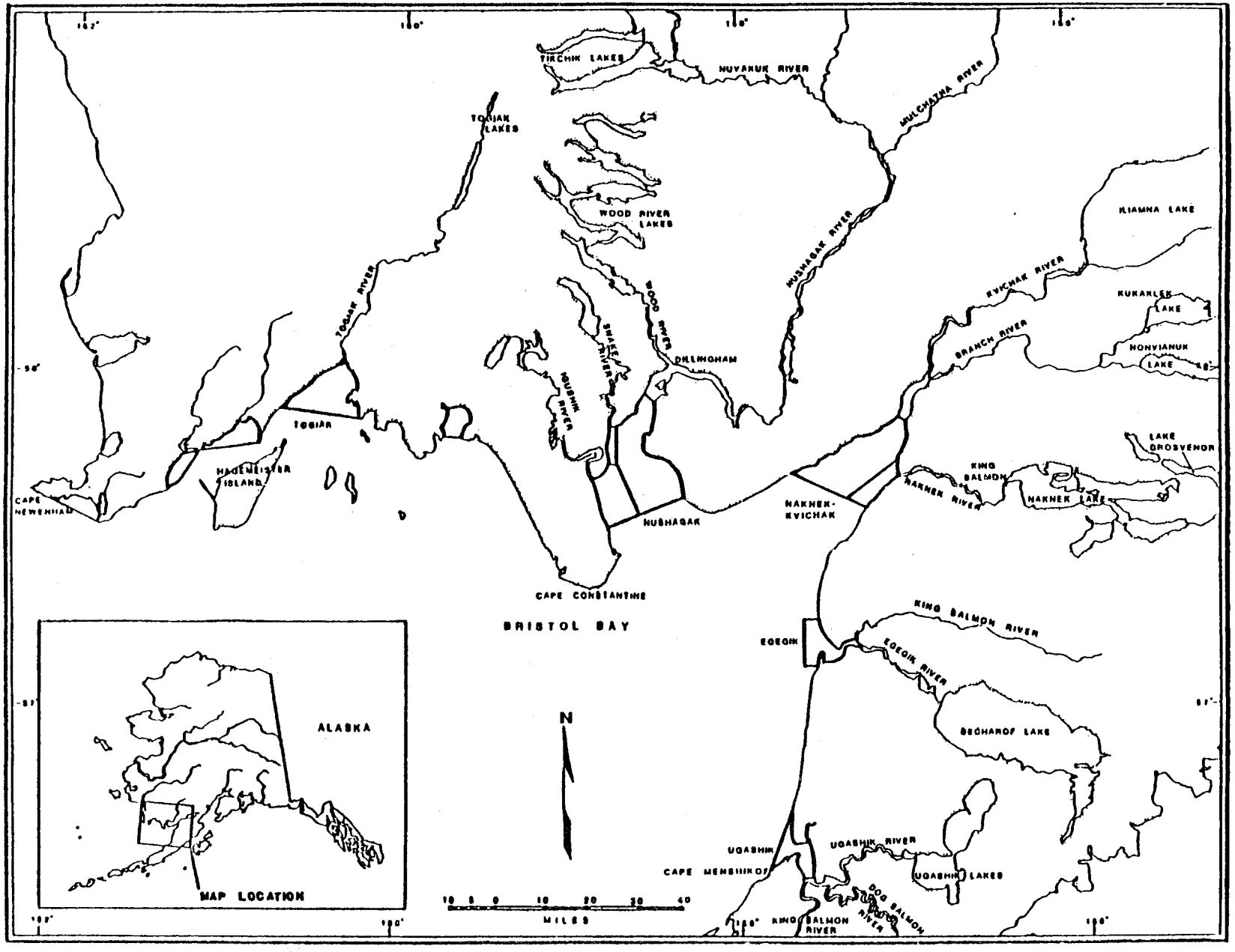

Figure 6. Bristol Bay area.

Table 56. Nushagak and Togiak District chinook salmon catch and escapement estimates by year, 1966-1980.

	Number of Fish						
	NUSHAGAK			TOGIAK			
Year	Catch 1/	Escapement 2/	Total	Catch 1/	Escapement 2/	Total	Total 3/
1966	61,884	40,000	101,884	9,967	-	-	-
1967	99,940	65,000	164,940	13,381	10,000	23,381	188,321
1968	84,801	70,000	154,801	13,449	16,000	29,449	184,250
1969	87,903	35,000	122,903	20,181	8,000	28,181	151,084
1970	94,447	50,000	144,447	28,664	15,000	43,664	188,111
1971	87,169	-	-	27,026	20,000	47,026	-
1972	50,045	25,000	75,045	19,976	14,000	33,976	109,021
1973	37,070	35,000	72,070	10,856	11,000	21,856	93,926
1974	39,653	70,000	109,653	11,998	15,000	26,998	136,651
1975	28,554	70,000	98,554	1,526	11,000	12,526	111,090
1976	67,584	100,000	167,584	30,244	14,000	44,244	211,828
1977	91,197	65,000	156,197	35,780	20,000	55,780	211,977
1978	125,490	130,000	255,490	57,719	40,000	97,719	353,209
1979	165,027	95,000	260,027	31,027	20,000	51,027	311,054
1980	76,781	141,000	217,781	13,402	12,000	25,402	243,183

1/ Includes commercial, subsistence, and sport catches.

2/ Derived from aerial surveys.

3/ Does not include chinook catches in other districts.

SOURCES: ADF&G. Spawning Ground Survey in the Nushagak and Togiak Districts of Bristol Bay (1966-80).
ADF&G. Annual Management Report 1980 Bristol Bay Area (1966-80).

Table 57. Bristol Bay commercial chinook salmon catch by district and year, and selected period averages, 1961-1980.

Year	District: Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Area Total
	Number of Fish					
1961	10,206	3,266	3,483	60,953	10,748	88,656
1962	8,816	2,070	2,929	61,283	8,949	84,047
1963	4,713	2,355	3,030	45,979	6,192	62,269
1964	12,902	3,618	3,694	108,606	10,716	139,536
1965	9,793	2,313	4,042	85,910	10,909	112,967
1966	5,456	1,949	1,916	58,184	9,967	77,472
1967	3,705	2,285	1,582	96,240	13,381	117,193
1968	6,398	3,472	2,153	78,201	13,499	103,723
1969	19,016	2,801	2,107	80,803	20,181	124,908
1970	19,037	3,765	1,498	87,547	28,664	140,511
1971	10,254	2,187	779	82,769	27,026	123,015
1972	2,262	1,097	166	46,045	19,976	69,546
1973	951	1,475	292	30,470	10,856	44,044
1974	480	1,133	1,200	32,053	10,798	45,664
1975	964	237	111	21,454	7,226	29,992
1976	4,064	1,138	338	60,684	29,744	95,968
1977	4,373	3,694	2,167	85,074	35,218	130,526
1978	6,930	3,126	5,935	118,548	57,000	191,539
1979 1/	4,057	3,607	8,117	155,473	30,581	201,835
1980 1/	7,907	5,329	5,809	64,324	12,339	95,708
1975-1979 Average	4,078	2,360	3,334	88,247	31,954	129,972
1970-1979 Average	5,337	2,146	2,060	72,012	25,709	107,264
1961-1979 Average	7,072	2,399	2,397	73,488	19,019	104,390

1/ Preliminary.

SOURCE: ADF&G. Annual Management Report 1980 Bristol Bay Area (1961-1980).
ADF&G. Alaska Commercial Salmon Catches (1961-1980).

Table 58. Bristol Bay subsistence chinook salmon catch estimates and selected period averages, by district and year, 1963-1980.

	Number of Fish					
Year	Naknek/Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1963	500		1/	3,600		4,100
1964	500			2,900		3,400
1965	500			4,600	100	5,100
1966	600			3,700		4,300
1967	500		1/	3,700		4,200
1968	500		1/	6,600		7,100
1969	400			7,100		7,500
1970	300		1/	6,900		7,200
1971	200			4,400		4,600
1972	400		100	4,000		4,500
1973	600		1/	6,600		7,200
1974	1,000	1/	100	7,600	1,200	9,900
1975	500	1/	1/	7,100	800	8,600
1976	900		100	6,900	500	8,400
1977	1,300	1/	100	5,200	400	7,000
1978	1,200		100	6,500	300	8,100
1979	1,200		1/	8,900	200	10,300
1980	1,500		1/	11,700	900	14,100
1975-1979 Average	1,060	2/	2/	6,920	440	8,480
1970-1979 Average	780	2/	2/	6,410	2/	7,580
1960-1979 Average	665	2/	2/	5,665	2/	6,559

1/ Less than 100 fish.

2/ Insufficient data.

SOURCE: ADF&G. Annual Management Report 1980 Bristol Bay Area (1963-1980).

Table 59. Bristol Bay chinook salmon sport catch estimates by area and year, and 1977-1979 average, 1962-1980.

Number of Fish

Year	Naknek River-Alaska Peninsula 1/			Kvichak River Drainage			Nushagak-Togiak 2/			Area Total
	Naknek River	Other	Total	Kvichak River	Other	Total	Nushagak River 3/	Other	Total	
1962	358 4/									
1962	581 4/									
1964	361 4/									
1965										
1966	1,000 5/									
1967	1,579 5/									
1968	2,203 5/									
1969	4,631 5/									
1970	2,730 6/									
1971	2,417 6/									
1972	1,668 6/									
1973	1,000 5/									
1974	1,700 5/									
1975	427 6/									
1976	800 5/									
1977 b/	1,005	400	1,405	9	234	243	923	162	1,085	2,733
1978 b/	2,628	221	2,849	210	12	222	442	419	861	3,932
1979 b/	2,264	346	2,610	10	78	88	654	146	800	3,498
1980 b/	2,729	340	3,073	129	52	181	757	163	920	4,174
1977-1979 Average	1,966	322	2,288	76	108	184	673	242	915	3,388

1/ All waters and drainages between Cape Douglas and the community of Naknek including the Naknek drainage and Aleutians.
2/ All waters of the Nushagak River drainage, the Wood River, and Tikchik Lake systems, and waters westward to Cape Newenham.
3/ Includes Mulchatna River system.
4/ Rapids Camp only.
5/ Informal creel census only.
6/ Formal creel census.

SOURCES: a: Gwartney, Louis A. Inventory and cataloging of the sport fish and sport fish waters of the Bristol Bay area. (1962-1976).

b: Mills, Michael J. Statewide harvest study. (1977-1979).

Table 60. Peak aerial survey counts and expanded escapement estimates of chinook salmon in selected streams, Nushagak River system, Bristol Bay, 1962-1980.

	Number of Fish							
Year	Muklung River	Iowithla River	Klutispaw River	King Salmon River	Stuyahok River	Koktuli River	Total escapement 1/2/	Sonar estimate
1962			80	470				
1963					230			
1964	1,000	100		700	1,410	3,300		
1965	570		140	850				
1966							40,000 3/	
1967	350	200			2,500	3,300	65,000 4/	
1968	750	850	310	1,000	2,470	4,220	70,000	
1969	520	580	90	670	1,220	1,600	35,000	
1970	590	700	320	1,060	1,900	1,500	50,000	
1971	280	390					5/	
1972	150	170	280	900	610	1,450	25,000	
1973			380	1,470	1,220	950	35,000	
1974	1,010	860	440	2,000	2,300	3,920	70,000	
1975	660	1,040	670	2,900	2,530	4,080	70,000	
1976	840	1,110	1,080	3,510	3,750	6,710	100,000	
1977	940	840	650	1,420	2,700	4,630	65,000	
1978	1,170	1,700	1,940	4,450	4,400	6,730	130,000	
1979	950	1,350	1,040	2,150	3,750	6,260	95,000	33,000
1980	1,600		970	4,500	7,200	10,260	141,000	56,000

1/ Comprehensive aerial coverage begun in 1968.
2/ Total estimates derived from aerial counts by expanding peak live counts to reflect fish not counted due to variables such as schooled and dead fish, late or poor survey conditions, bad weather, etc.
3/ Tower enumeration data from Nushagak River included.
4/ Tower enumeration data, minimal aerial survey coverage, and general run strength indicators (commercial and subsistence catches).
5/ Escapement estimate precluded by adverse weather. Information indicates a "light escapement" compared to previous years.

SOURCES: ADF&G. Spawning ground surveys in the Nushagak and Togiak Districts of Bristol Bay (1962-1980).
ADF&G. Annual management report Bristol Bay area (1962-1980).
ADF&G. Nushagak sonar enumeration project (1979-1980).

Table 61. Peak aerial survey counts and expanded escapement estimates of chinook salmon in selected streams, Togiak District, Bristol Bay, 1967-1980.

Number of Fish

	Togiak Drainage							Ungalikthluk Drainage							
Year	Togiak River	Gechiak River	Pungokepuk River	Kashiak River	Navogurum River	Ongivinuk River	Total	Ungalikthluk River	Kukagachagak River	Total	Kulukak River	Osviak/ Mataogak R.	Quigmy River	Total Aerial	Expanded escapement estimate
1967	2,700	610					3,310	50	80	130	460			3,900	10,00
1968	4,940	800	330	400	540	450	7,460	130	10	140	290			7,890	16,00
1969	2,100	440	100	200	260	370	3,470	280	60	340	260			4,070	8,00
1970	1,950	570	50	60	170	310	3,110	470	50	520	1,490			5,170	15,00
1971	3,070	980	150	220	180	220	4,820	470	220	690	2,360			7,870	20,00
1972	2,490	1,320	200	210	170	220	4,610	120	160	280	650			5,540	14,00
1973	2,520	470	110	220	140	220	3,680	280	30	310	440			4,430	11,00
1974	3,820	620	200	120	170	220	5,150	150	30	180	510			5,840	15,00
1975	1,890	350	240	140	220	220	3,060	220	80	300	1,100			4,460	11,00
1976	2,470	550	350	270	120	120	3,880	380	30	410	1,080	100		5,470	14,00
1977	380	1,190	500	230	290	90	2,680	440	40	480	1,480	180		4,820	20,00
1978	7,290	2,150	590	780	580	470	11,860	1,020	110	1,130	2,720	400		16,110	40,00
1979	2,550	1,060	360	250	160	180	4,560	850	130	980	2,260	310	20	8,130	20,00
1980	1,130	910	200	510	170	190	3,110	260	160	420	700	110	0	8,680	12,00

1/ Comprehensive aerial survey coverage was begun in 1967.

2/ Derived by subjectively expanding peak aerial count to reflect fish not counted due to variables such as schooled and dead fish, late or poor survey conditions, bad weather, etc.

SOURCES: ADF&G. Spawning ground survey in the Nushagak and Togiak Districts of Bristol Bay (1967-1980).
ADF&G. Annual management report 1980 Bristol Bay area (1967-1980).

Table 62. Chinook salmon escapement estimates, Naknek-Kvichak District, Bristol Bay area, 1963-1980.

Year	Number of Fish		
	Naknek River Drainage 1/	Alagnak River 2/	District Total
1963	2,690 3/		2,690
1964	1,160 3/		1,160
1965	867 3/		867
1966	1,223 3/		1,223
1967	2,529		2,529
1968	7,120	8,500	15,620
1969	8,799	6,000	14,799
1970	4,360	5,000	9,360
1971	2,866	1,450	4,316
1972	2,791	2,350	5,141
1973	2,671	1,000	3,671
1974	2,650	1,700	4,350
1975	3,925	7,300	11,225
1976	9,150	8,700	17,850
1977	10,800		10,800
1978	9,350		9,350
1979	7,150		7,150
1980 4/			

1/ Naknek River estimates are combination of ground and aerial surveys.

2/ (Branch River). Estimates are midpoint of range reported by source author.

3/ Big Creek only.

4/ No estimate.

SOURCE: Paddock, Dean. Inventory and cataloging of the sport fish and sport fish waters of the Bristol Bay area. Annual Reports 1965-1968. Project F-5-R (12-A).

Gwartney, Louis A. Inventory and cataloging of the sport fish and sport fish waters of the Bristol Bay area. Annual Reports 1970-1981. Project F-9 (G-I-E).

Table 63. Sex and age composition of chinook salmon commercial catch samples taken during the chinook salmon season, Nushagak and Igushik Districts, Bristol Bay, 1961-1980.

Year	Number of Fish	Percent Composition								
		Sex		Age						
		Male	Female	1.2	1.3	1.4	2.3	1.5	2.4	Other
1961	313	50.5	49.5	10.5	23.3	57.8	0.6	1.0	0.6	6.2
1962	276	51.4	48.6	6.9	15.8	68.1		7.2	1.1	1.9
1963	46	67.4	32.6	45.6	13.0	30.4		10.9		
1964	211	76.8	23.2	50.2	19.0	27.0		3.3		1.5
1965	244	63.1	36.9	12.3	36.5	42.2	0.4	7.8	0.4	0.8
1966 1/	716	65.6	34.4	15.4	33.9	48.0		1.8	0.4	0.5
1967 1/	2,130	66.6	33.4	22.0	26.8	42.4	0.3	4.9	0.2	3.4
1968 1/	1,692	57.3	42.7	5.4	32.0	49.6	0.1	8.8	0.2	3.9
1969 1/	1,667	47.4	52.6	12.5	26.2	51.8	0.1	5.7	0.7	3.0
1970 1/	2,021	60.4	39.6	7.5	60.6	22.5	0.2	2.5	0.1	6.7
1971 1/	1,396	46.1	53.9	4.6	21.6	68.9		0.7	0.3	3.9
1972 1/	978	55.6	44.4	18.4	22.2	50.8	0.2	4.6	0.3	3.5
1973	380	51.6	48.4	0.3	22.9	65.3	0.3	9.4	0.5	1.3
1974	357	41.5	58.5	1.4	13.4	62.5		21.8	0.6	0.3
1975	360	44.4	55.6	2.5	57.5	30.0	0.8	8.6	0.8	
1976	712	45.6	54.4	2.4	37.9	57.0	0.9	1.0	0.3	0.5
1977	780	53.2	46.8	2.0	34.5	59.4	0.6	2.3	0.4	0.8
1978	457	57.1	42.9	1.1	33.9	54.5	1.3	5.3	3.3	0.6
1979 2/										
1980 2/										

1/ Combined data for chinook and sockeye salmon season.

2/ Data not summarized.

Table 64. Sex and age composition of chinook salmon catch samples taken during the sockeye salmon season, Nushagak and Igushik Districts, Bristol Bay, 1961-1980.

Year	Number of Fish	Percent Composition								
		Sex		Age						
		Male	Female	1.2	1.3	1.4	2.3	1.5	2.5	Other
1961 1/										
1962 1/										
1963 1/										
1964 1/										
1965 1/										
1966 2/										
1967 2/										
1968 2/										
1969 2/										
1970 2/										
1971 2/										
1972 2/										
1973	61	67.2	32.8	9.8	36.1	45.9		3.3		4.9
1974 1/										
1975 1/										
1976	140	70.7	29.3	44.3	26.4	25.7	0.7	2.2		0.7
1977 1/										
1978	208	67.3	32.7	35.6	26.4	31.7	0.5	3.9	1.0	0.9
1979 3/										
1980 3/										

1/ No data.

2/ Combined data for chinook and sockeye salmon season.

3/ Data not summarized.

Table 65. Size composition estimates of chinook salmon, Nushagak District commercial catch, Bristol Bay, 1961-1980.

Year	Mean weight (lbs)	Length (mm)													
		Males							Females						
		1.2	1.3	1.4	2.3	1.5	2.4	2.5	1.2	1.3	1.4	2.3	1.5	2.4	2.5
1961	-	570	777	904	725		815			825	916	860	943	925	
1962	-	563	768	924		874	932			812	927		958	933	
1963	-	598	787	853						815	889		977		
1964	15.2	560	713	872		887				794	888		927		
1965	20.1	550	732	876	843	937				794	888		942		
1966	18.2	536	714	859		929				787	871		933	825	
1967	20.9	547	719	860	730	953	780		719	798	883	833	916	904	
1968	19.3	565	745	858	778	947				801	879		924	876	
1969	20.7	620	755	865	772	916	873		666	820	881		905	896	
1970	22.2	586	772	888	818	946	898		590	822	889	874	920	925	
1971	24.6	558	746	886		950	862		515	808	897		904	890	
1972	20.5	543	715	854	579	901			557	764	866	810	922	888	
1973	24.9	516	756	840		889	840			792	853	740	897	730	
1974	25.4	575	755	836		921	902		887	789	887		924		
1975	21.1	580	770	869		940	881		569	772	875	803	901	948	
1976	23.2	558	814	877	846	940	879		666	852	878	802	900	870	
1977	24.5	568	773	873	734	889	804		610	814	871		911	935	
1978	22.9	583	741	879	746	962	884		586	750	887	746	947	879	923
1979 1/															
1980 1/															

1/ Data not summarized.

SOURCE: ADF&G. Age, size, and sex composition of Bristol Bay salmon (1961-1980). Unpublished data.

Table 66. Age and sex composition of chinook salmon Naknek River sport catch samples, Bristol Bay area, 1966-1979.

Year	Number of Fish	Percent Composition							
		Sex		Age					
		Male	Female	1.1	1.2	1.3	1.4	1.5	Other
1966	84	67.9	32.1	9.0	24.0	29.0	33.0	5.0	
1971	184			5.4	26.6	33.2	37.5		3.3
1975	99			13.0	46.0	22.0	13.0	5.0	
1978	229	67.3	32.7	21.8	13.5	22.3	41.1	1.3	
1979	201	65.7	34.3	11.4	22.9	11.9	50.3	3.5	

SOURCE: Gwartney, Louis A. Inventory and cataloging of the sport fish and sport fish waters of the Bristol Bay area. Annual Reports 1975-1979. Project F-9 (G-I-E).

KUSKOKWIM

The Kuskokwim area includes all waters of the Kuskokwim River drainage and the area between Cape Newenham and the Naskonat Peninsula (Figure 9). The major geographical feature of the region, the Kuskokwim River, is also the principal chinook salmon producer. The Kuskokwim River is divided into 3 subdistricts: 335-10 (lower), 335-20 (middle), and 335-30 (upper). Chinook also spawn in the Kanektok River (Quinhagak subdistrict) and the Goodnews River. The Kuskokwim area supports major commercial and subsistence fisheries and a small sport harvest. This region is unique in that subsistence harvests of chinook salmon often exceed the commercial catch.

Chinook salmon are exceeded in abundance only by chum salmon in Kuskokwim area subsistence and commercial catches. Since 1961, the catches in subsistence and commercial fisheries have been virtually identical (1961-1979 subsistence average 44,000 fish; commercial average 41,000; Tables 67 and 68). While recent catches (1975-1979 subsistence average 53,000 fish; commercial average 50,000) have been consistently above historical levels, it is unknown if this trend is primarily due to increased run-size or the effects of an expanding and more efficient fishery. The size of the annual commercial catch is more a function of predetermined harvest goals than a reflection of actual run magnitude. Subsistence fishing effort is shifting from fishwheels to more mobile and efficient gill nets. Both subsistence and commercial fisheries are centered in the lower Kuskokwim River (subdistrict 335-10). During the period 1961-1979 chinook catches in this subdistrict have averaged 63% of the subsistence and 76% of the commercial harvest. Subsistence fishing effort is fairly uniform except during the commercial openings. Directed commercial effort for chinook salmon is regulated closely and normally allowed for only 6 to 12 hours each week. This regulation is imposed to insure that sufficient salmon are available for escapement and the subsistence fishery. Because accurate estimates of the actual magnitude of the run are not available, and because of the importance of subsistence fishing in the area, the commercial fishery has been managed conservatively. The guideline harvest range for the directed chinook salmon fishery in the Kuskokwim River was lowered from 30,000-40,000 fish during the period 1968-1972 to the current level of 25,000 fish.

No estimates of total escapement to the Kuskokwim area are made. Escapement estimates from aerial surveys of selected tributaries have been made but have supplied only limited information due to highly variable stream and survey conditions between areas and years (Table 70). Aerial survey counts suggest that the Kanektok River is the major chinook salmon producer in the area. However, survey conditions on the Kanektok River are usually rated excellent and it is felt that Kuskokwim River tributaries which drain into the main river from the south and east are the area's largest producers. Efforts to estimate escapement have focused on more accurate counting of chinook in known major spawning tributaries; primarily the Holitna River, using a weir, and the Aniak Rivers, where sonar is employed. The Kogrukluk River tower and weir cover only part of the Holitna River drainage and the 1980 Aniak River sonar estimate was much larger than that obtained from aerial surveys.

The commercial and test fish catches have been primarily composed of age 1.3 and 1.4 fish with age 1.4 fish being most abundant (Tables 71-74; 78-81). The age composition of Kweegoyuk test fish catches has closely paralelled that of Kuskokwim commercial catches. Trends in age and sex composition are unclear as these data are unweighted. Also, sizes of samples from the commercial catch have been lowered since 1974. Age data from the Holitna River escapement (Ignatti River weir; Tables 75 and 76) show a much higher percentage of 2-ocean fish (jacks) than observed in the catch. Interpretation of age data for the older age classes is speculative because age is largely estimated from observations of fish size as they pass through the weir.

A total of 109,000 chinook salmon were harvested in the Kuskokwim area in 1980. The 1980 harvest was almost equally divided between the subsistence (60,000 fish) and commercial (48,000) fisheries. The subsistence harvest was slightly above the recent 5-year average while the commercial harvest was slightly below the recent 5-year average. Although directed commercial fishing for chinook salmon (8-1/2 inch mesh gill nets) was limited to two 6-hour periods, most of the commercial harvest (29,000 fish) was taken during these periods. The remaining harvest was taken later in chum salmon fisheries with 6-inch mesh gill nets. Test fish data from the lower river indicated that the run was of average magnitude and peaked during mid-June. Samples taken from the lower Kuskokwim River commercial catch (8-1/2 inch mesh gill nets) indicate that the dominant age class was 1.3. More than 70% were male.

Aerial counts of 6,200 fish in the Kanektok River and 1,200 fish in the Goodnews River in 1980 suggest better-than-average runs for these two areas. Aerial indices for the Kuskokwim River drainage indicate only average returns. Due to high water, the Holitna River weir was operated only four days in July. A sonar counter on the Aniak River in 1980 indicated that the actual escapement may be much larger than previous estimates; more than 56,000 fish were detected.

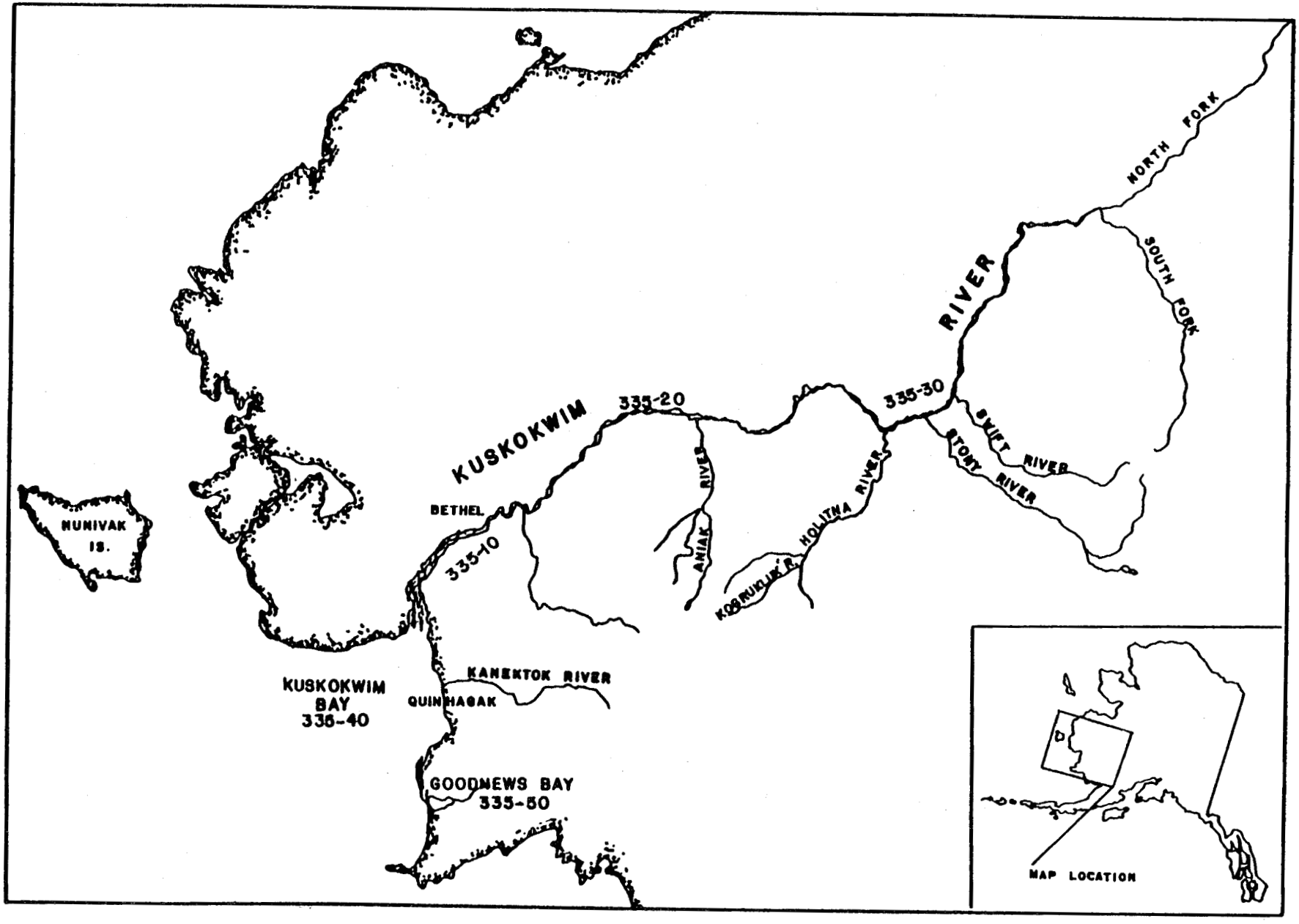

Figure 7. Kuskokwim River area.

Table 67. Kuskokwim area commercial chinook salmon catches by subdistrict and year, and selected period averages, 1961-1980.

Number of Fish

Year	Kuskokwim River 335-10 1/	Kuskokwim River 335-20 1/	Kuskokwim River 335-30 2/	Kuskokwim River Total 3/	Quinhagak 335-40	Goodnews 335-50	335-60	Area Total
1961	15,820	1,551	1,547	5,969	4,328			23,246
1962	13,306	2,035	0	18,918	5,526			20,867
1963	9,095	2,921	0	15,341	6,555			18,571
1964	15,754	1,395	0	12,016	4,081			21,320
1965	21,452	537	0	17,149	2,976			24,965
1966	25,212	333	0	21,989	278			25,823
1967	29,367	615		25,545	0			29,986
1968	33,451	826		29,986	8,879	0		43,157
1969	43,141	853		34,278	16,802	3,978	7	64,777
1970	37,715	1,463		43,997	18,629	7,163		65,082
1971	35,421	2,439		39,290	4,185	477		44,936
1972	37,699	1,755		40,274	15,880	264		55,482
1973	28,194	2,244		39,454	14,993	3,543		51,374
1974	16,031	951		32,838	8,704	3,302		30,670
1975	18,235	1,319		18,664	3,928	2,151		27,799
1976	20,010	3,316		21,720	14,110	4,417		49,262
1977	28,685	3,975		30,735	19,090	3,336		58,256
1978	36,139	2,087		35,830	12,335	5,218		63,194
1979	24,633	2,913		45,641	11,144	3,204		53,314
1980 4/	25,812	1,697		38,966	10,387	1,974		48,242
1975-1979 Avg.	25,540	2,722	5/	30,518	12,121	3,665	5/	50,365
1970-1979 Avg.	28,276	2,246	5/	34,844	12,300	3,308	5/	49,937
1961-1979 Avg.	25,733	1,765	5/	27,875	9,075	5/	5/	40,636

1/ Chinook salmon season only.
2/ Commercial fishing has been prohibited since 1966.
3/ Actual drainage totals. Individual district totals may not sum to actual total due to chinook salmon harvested after the chinook salmon season.
4/ Preliminary
5/ Insufficient data.

SOURCES: ADF&G. Annual Salmon Management Report Kuskokwim Area (1961-1980).
ADF&G. Alaska Commercial Salmon Catches (1961-1981).

Table 68. Kuskokwim area subsistence chinook salmon catches by subdistrict and year, and selected period averages, 1961-1980.

	Number of Fish					
Year	335-10 1/	335-20 1/	335-30 1/	Total 2/	Other 3/	Area Total
1961	26,241	3,848	821	30,910	--	30,910
1962	12,369	1,493	780	14,642	--	14,642
1963	31,452	4,588	1,206	37,246	--	37,246
1964	23,309	3,603	2,105	29,017	1,836	30,853
1965	23,084	26,186	957	27,143	4,000	31,143
1966	40,353	6,951	2,302	49,606	4,000	53,606
1967	49,766	6,774	1,405	57,875	3,349	61,224
1968	25,129	4,422	679	30,230	4,756	34,986
1969	30,550	6,423	3,165	40,138	3,594	43,732
1970	60,768	7,230	1,206	69,204	2,172	71,376
1971	34,282	5,491	3,145	42,926	2,539	45,465
1972	32,907	6,689	549	40,145	3,190	43,335
1973	38,774	5,541	1,211	38,526	3,171	41,697
1974	19,538	5,558	1,569	26,665	2,925	29,590
1975	37,745	7,830	1,994	47,784	3,261	51,045
1976	46,514	9,525	1,888	58,185	2,418	60,603
1977	39,470	10,967	1,902	55,577	2,586	58,163
1978	26,779	7,679	1,423	35,881	2,328 4/	38,209 4/
1979	41,537	10,723	2,524	55,524	1,759	57,283
1980	44,903	12,870	1,651	59,900	--	59,900
1975-1979 Avg.	38,409	9,345	1,946	50,590	2,470	53,061
1970-1979 Avg.	37,831	7,723	1,741	47,042	2,635	49,677
1961-1979 Avg.	33,188	7,448	1,623	41,433	5/	43,953

1/ Only includes villages consistently surveyed for comparative purposes.
2/ Actual total. Individual district totals may not equal actual total.
3/ Other than Kuskokwim River villages.
4/ Goodnews Bay not surveyed.
5/ Insufficient data.

SOURCES: ADF&G. Annual Salmon Management Report Kuskokwim Area (1961-1980).

Table 69. Kuskokwim area sport chinook salmon catches by year, and 1977-1979 average, 1977-1980 1/.

Year	Number of Fish Area Total
1977	177
1978	629
1979	400
1980	878
1977-1979 Average	402

1/ These totals include all waters of the Kuskokwim and Yukon (excluding the Tanana River drainage) Rivers, and other streams flowing into Kuskokwim Bay.

SOURCES: ADF&G. Statewide Sport Fish Studies (1977-1980).

Table 70. Kuskokwim area chinook salmon escapement counts by location and year, 1961-1980[1/].

Number of Fish

			Kuskokwim River Drainage											
					Aniak Drainage				Holitna Drainage					Pitka Fork
Year	Goodnews R.	Kanektok R.	Kwethluk R.	Kisaralik R.	Aniak R.	Salmon R.	Kipchuk R.	Sonar	Chukowan R.	Kogrukluk R. Aerial	Kogrukluk R. Tower	Kogrukluk R. Weir	Salmon R.
1961	1,780	1,650			497					214			
1962		935	248	327	925								
1963													
1964		627											
1965				194	646								
1966		3,718	516	204	2,184	141	491		986	1,645			
1967					758[2/]		200			1,033			
1968	1,790	4,170	800	487	1,420		319		1,260	2,180			
1969	75	119			537[2/]						2,980		
1970		3,112		531	1,231	381	821		1,118	1,598	3,868		
1971					144[2/]					636	42		
1972		73	68		93[2/]	43			163	476	1,934		
1973		814		152	200[2/]	100			229	610	1,725		
1974		197	88	4	196	35	73				3,724		
1975	829	1,278	few	129	202	32	94		667	1,062	1,970		272
1976	1,150	2,115	997	873	281	86	177		727	518	3,261	5,507	1,149
1977	2,163	5,787	1,999		21[2/]	625	16			1,342	1,988	2,598	1,930
1978		9,181	1,276	2,417	140[2/]	322	187		1,064		7,405	13,123	1,083
1979	635	601	882	38								11,299	667
1980	1,228	6,172				1,186	1,932	56,500		540		6,572	1,450

1/ Aerial surveys except where otherwise noted.

2/ Above Salmon River confluence only.

SOURCES: ADF&G. Annual Salmon Management Report Kuskokwim Area (1961-1980).
ADF&G. Aniak River Sonar Studies (1980).

Table 71. Sex and age composition of chinook salmon, Bethel commercial catch samples[1/], Kuskokwim area, 1964-1980.

Year	Number of Fish	Percent Composition							
		Sex		Age					
		Male	Female	1.1	1.2	1.3	1.4	1.5	1.6
1964	681	48.0	52.0		1.5	20.3	64.1	13.5	0.6
1965	370	58.6	61.4			44.9	32.4	20.8	1.9
1966	512	50.4	49.6		0.4	12.1	85.2	2.3	
1967	610	47.4	52.6		0.5	10.2	73.4	15.9	
1968	560	56.1	43.9		3.2	25.2	52.2	19.4	
1969	594	54.7	45.3		5.2	41.2	44.6	9.0	
1970	472	54.7	45.3		1.7	60.8	36.3	1.2	
1971	810	51.1	48.9		5.7	25.0	68.5	0.8	
1972	576	46.7	53.3		0.5	19.8	75.0	4.5	0.2
1973	449	43.2	56.8		2.4	23.6	66.4	7.6	
1974[2/]	119	56.3	43.7	0.8	8.4	11.7	65.6	13.5	
1975	185	71.9	28.1		0.5	82.7	10.8	6.0	
1976	224	50.4	49.6		0.0	41.5	55.9	2.6	
1977	237	63.3	36.7		3.4	30.4	62.4	3.8	
1978	290	44.1	55.9		0.3	13.5	80.3	5.9	
1979	195	44.1	55.9		10.8	41.5	41.0	6.7	
1980	278	71.2	28.8		10.4	65.1	21.9	2.5	

1/ 8-1/2 inch mesh gillnets. Catches from subdistricts 335-10 and 335-20.

2/ Sampled at Johnson River.

SOURCE: ADF&G. Arctic-Yukon-Kuskokwim Region Age, Sex, and Size Composition of Salmon (1961-1980).

Table 72. Size composition of chinook salmon, Kuskokwim River commercial catch samples, Kuskokwim area, 1964-1980.

Year	Mean Weight (lbs)[b/]	Length (mm)[a/] Males 1.2	1.3	2.2	1.4	2.3	1.5	2.4	1.6	2.5	Females 1.2	1.3	2.2	1.4	2.3	1.5	2.4	1.6	2.5
1964	23.2	594	767	710	854	770	911	878		920	677	768	670	869	788	906	864	1000	905
1965	21.7		741		836	773	979	818		730		781		865	795	922	892		912
1966	23.2	622	819		921		1068					852		923		970			
1967	27.8	664	741		898		972					778		888		910			
1968	23.8	586	743		864	704	968	999				805		890	858	952	905		
1969	19.6																		
1970	18.9																		
1971	26.2																		
1972	24.7																		
1973	26.7																		
1974	17.1																		
1975	14.9																		
1976	17.0																		
1977	22.7																		
1978	24.2																		
1979	16.6																		
1980	14.1																		

SOURCES: a/ ADF&G. Arctic-Yukon-Kuskowkim Region Age, Sex, and Size Composition of Salmon (1964-1980).

b/ ADF&G. Kuskokwim Area Annual Management Report (1964-1980).

Table 73. Sex and age composition of chinook salmon, Quinhagak subdistrict commercial catch samples, Kuskokwim area, 1968-1980.

Year	Number of Fish	Percent Composition						
		Sex		Age				
		Male	Female	1.1	1.2	1.3	1.4	1.5
1968 1/	161	61.5	38.5		19.3	29.2	42.2	8.1
1969 2/	271	74.9	25.1	1.5	47.9	17.0	27.7	5.9
1970 3/	259	73.4	26.6		22.4	36.6	34.0	7.0
1971								
1972								
1973								
1974 2/	141	66.0	34.0	1.4	29.8	13.4	26.3	29.1
1975 2/	200	73.5	26.5	1.5	33.0	45.5	15.5	4.5
1976 2/	349	78.5	21.5		53.0	30.3	16.1	0.6
1977 4/	480	51.3	48.7		3.3	40.8	54.7	1.2
1978 4/	234	42.7	57.3			5.1	88.5	6.4
1979 4/	286	59.4	40.6		17.2	42.6	35.6	4.6
1980 4/	572	66.6	33.4	5.2	28.3	42.0	21.2	3.3

1/ No mesh size specified.

2/ 5-1/2 inch mesh gillnets.

3/ 5-1/2 to 8-1/2 inch mesh gillnets.

4/ 6 inch or smaller mesh gillnets.

SOURCE: Arctic-Yukon-Kuskokwim Region Age, Sex, and Size Composition of Salmon (1961-1980).

Table 74. Sex and age composition of chinook salmon, Kwegooyuk test fishery, Kuskokwim River, 1969-1980.

Year	Number of Fish	Percent Composition							
		Sex		Age					
		Male	Female	1.1	1.2	1.3	1.4	1.5	1.6
8-1/2 Inch Mesh									
1969	568	50.7	49.3		15.1	31.8	43.2	9.7	0.2
1970 1/	84	64.3	35.7			16.7	54.7	28.6	
1971	133	48.1	51.9		9.8	21.8	59.4	9.0	
1972	361	48.2	51.8		1.1	22.8	70.9	4.0	0.3
1973	244	53.7	46.3		4.1	12.0	68.8	15.2	
1974	461	49.5	50.5	4.1	6.9	13.7	56.2	19.1	
1975	372	69.9	30.1		3.7	53.5	38.2	4.6	
1976	809	44.4	56.6		1.9	32.9	65.1	0.1	
1977	616	50.3	49.7		0.6	32.4	64.9	2.1	
1978	428	49.3	50.7		1.4	13.7	78.9	6.0	
1979	263	54.4	45.6		22.5	25.8	40.7	11.0	
1980 2/	525	61.0	39.0		6.1	58.1	33.5	2.3	
5-1/2 Inch Mesh									
1974	269	90.3	9.7	15.2	59.2	11.8	10.8	2.6	0.4
1975	83	81.9	18.1		25.3	47.0	22.9	3.6	1.2
1976	138	90.6	9.4		60.9	22.4	16.0	0.7	
1978	70	94.2	5.8		35.7	42.9	18.4	3.0	
1979	39	56.4	43.6		66.7	20.5	12.8		

1/ Both 8-1/2 and 5-1/2 inch mesh.
2/ No mesh size specified.

SOURCE: ADF&G. Arctic-Yukon-Kuskokwim Region Age, Sex, and Size Composition of Salmon (1961-1980).

Table 75. Sex and age composition of chinook salmon escapement samples, Ignatti Weir, Holitna River, Kuskokwim area, 1971-1980.

Year	Number of Fish	Percent Composition					
		Sex		Age			
		Male	Female	1.2	1.3	1.4	1.5
1971	14	71.4	28.6		21.4	71.5	7.1
1972 1/	4	50.0	50.0	25.0	50.0		25.0
1973 1/	10	60.0	40.0		30.0	60.0	10.0
1974							
1975							
1976 2/	5,499	60.5	39.5	14.8	21.8	61.9	1.5
1977 2/	1,373	39.4	60.6	3.6	22.0	73.6	
1978 2/	509	52.5	47.5	16.9	10.2	56.8	16.1
1979 2/	393	82.3	17.7	63.1	15.5	17.8	3.5
1980	63	84.0	16.0	30.0	48.0	14.0	8.0
1980 1/	60	58.0	42.0	12.0	53.0	27.0	9.0

1/ Carcass samples.

2/ Age and sex composition based on visual observations of fish size.

SOURCE: ADF&G. Arctic-Yukon-Kuskokwim Region Age, Sex, and Size Composition of Salmon (1961-1980).

Table 76. Sex and age composition of chinook salmon samples, from Ignatti Weir, Holitna River, Kuskokwim area, 1980.

Sample Period	Date	Sex		Age 1.2	1.3	1.4	1.5	Total
1 1/		Male	Number	19	27	4	3	53
			Percent	30.0	43.0	6.0	5.0	84.0
		Female	Number		3	5	2	10
			Percent		5.0	8.0	3.0	16.0
		Combined	Number	19	30	9	5	63
			Percent	30.0	48.0	14.0	8.0	100.0
1 2/		Male	Number	7	24	3	1	35
			Percent	12.0	40.0	5.0	2.0	58.0
		Female	Number		8	13	4	25
			Percent		13.0	22.0	7.0	42.0
		Combined	Number	7	32	16	5	60
			Percent	12.0	53.0	27.0	9.0	100.0

1/ Random weir sample.

2/ Carcass sample.

SOURCE: ADF&G. Arctic-Yukon-Kuskokwim Region Age, Sex, and Size Composition of Salmon (1961-1980).

Table 77. Sex and age composition of chinook salmon, Bethel commercial catch samples, Kuskokwim area, 1980[1/].

Sample Period	Date	Sex		Age 1.2	1.3	1.4	1.5	Total
1	6/8-6/14	Male	Number	2	60	15		77
			Percent	1.9	55.6	13.9		71.3
		Female	Number		11	19	1	31
			Percent		10.2	17.6	0.9	28.7
		Combined	Number	2	71	34	1	108
			Percent	1.9	65.7	31.5	0.9	100.0
2	6/15-6/21	Male	Number	6	60	9	2	77
			Percent	5.5	54.5	8.2	1.8	70.0
		Female	Number		23	7	3	33
			Percent		20.9	6.4	2.7	30.0
		Combined	Number	6	83	16	5	110
			Percent	5.5	75.5	14.5	4.5	100.0
3	6/22-2/28	Male	Number	18	20	3		41
			Percent	31.6	35.1	5.3		71.9
		Female	Number		7	8	1	16
			Percent		12.3	14.0	1.8	28.1
		Combined	Number	18	27	11	1	57
			Percent	31.6	47.4	19.3	1.8	100.0
4	7/6-7/12	Male	Number	3				3
			Percent	100.0				100.0
		Female	Number					
			Percent					
		Combined	Number	3				3
			Percent	100.0				100.0
Total	6/8-7/12	Male	Number	29	140	27	2	198
			Percent	10.4	50.4	9.7	0.7	71.2
		Female	Number		41	34	5	80
			Percent		14.7	12.2	1.8	28.8
		Combined	Number	29	181	61	7	278
			Percent	10.4	65.1	21.9	2.5	100.0

1/ Eight and one-half inch mesh gill nets. Catches from subdistricts 335-10 and 335-20.

SOURCE: Arctic-Yukon-Kuskokwim Region Age, Sex, and Size Composition of Salmon (1980).

Table 78. Sex and age composition of chinook salmon, Quinhagak Subdistrict commercial catch 1/samples, Kuskokwim, 1980.

Sample Period	Date	Sex		Age 1.1	1.2	1.3	1.4	1.5	Total
1	6/8-6/14	Male	Number		18	6	7	1	32
			Percent		34.6	11.5	13.5	1.9	61.5
		Female	Number			1	13	6	20
			Percent			1.9	25.0	11.5	38.5
		Combined	Number		18	7	20	7	52
			Percent		34.5	13.5	38.5	13.5	100.0
2	6/15-6/21	Male	Number	3	22	10	7	2	44
			Percent	5.4	39.3	17.9	12.5	3.6	78.6
		Female	Number			7	5		12
			Percent			12.5	8.9		21.4
		Combined	Number	3	22	17	12	2	56
			Percent	5.4	39.3	30.4	21.4	3.6	100.0
3	6/22-6/28	Male	Number	5	45	36	12	1	99
			Percent	3.1	28.1	22.5	7.5	0.6	61.9
		Female	Number			38	20	3	61
			Percent			23.8	12.5	1.9	38.1
		Combined	Number	5	45	74	32	4	160
			Percent	3.1	28.1	46.3	20.0	2.5	100.0
4	6/29-7/5	Male	Number	2	16	11	3		32
			Percent	3.9	31.4	21.6	5.9		62.7
		Female	Number			9	8	2	19
			Percent			17.6	15.7	3.9	37.3
		Combined	Number	2	16	20	11	2	51
			Percent	3.9	31.4	39.2	21.6	3.9	100.0
5	7/6-7/12	Male	Number	7	35	54	11		107
			Percent	4.6	23.0	35.5	7.2		70.4
		Female	Number			26	18	1	45
			Percent			17.1	11.8	0.7	29.6
		Combined	Number	7	35	80	29	1	152
			Percent	4.6	23.0	52.6	19.1	0.7	100.0

-Continued-

Table 78. Sex and age composition of chinook salmon, Quinhagak Subdistrict commercial catch[1/] samples, Kuskokwim, 1980 (continued).

Sample Period	Date	Sex		Age 1.1	1.2	1.3	1.4	1.5	Total
6	7/13-7/19	Male	Number	11	22	22	5	1	61
			Percent	12.0	23.9	23.9	5.4	1.1	66.3
		Female	Number			17	12	2	31
			Percent			18.5	13.0	2.2	33.7
		Combined	Number	11	22	39	17	3	92
			Percent	12.0	23.9	42.4	18.4	33.3	100.0
7	7/20-7/26	Male	Number						
			Percent						
		Female	Number						
			Percent						
		Combined	Number						
			Percent						
8	7/27-7/31	Male	Number	2	4				6
			Percent	22.2	44.4				66.7
		Female	Number			3			9
			Percent			33.3			33.3
		Combined	Number	2	4	3			9
			Percent	22.2	44.4	33.3			100.0
Total	6/8-7/31	Male	Number	30	162	139	45	5	381
			Percent	5.2	28.3	24.3	7.9	0.9	66.6
		Female	Number			101	76	14	191
			Percent			17.7	13.3	2.4	33.4
		Combined	Number	30	162	240	121	19	572
			Percent	5.2	28.3	42.0	21.2	3.3	100.0

1/ Six inch mesh gill nets or smaller.

SOURCE: ADF&G. Arctic-Yukon-Kuskokwim Region Age, Sex, and Size Composition of Salmon (1980).

Table 79. Sex and age composition of chinook salmon, Kwegooyuk test fishery, Kuskokwim River, 1980.

Sample Period	Date	Sex		Age 1.2	1.3	1.4	1.5	Total
1	5/18-5/24	Male	Number					
			Percent					
		Female	Number			1		1
			Percent			100.0		100.0
		Combined	Number			1		1
			Percent			100.0		100.0
2	5/25-5/31	Male	Number		12	8		20
			Percent		37.5	25.0		62.5
		Female	Number		4	7	1	12
			Percent		12.5	21.9	3.1	37.5
		Combined	Number		16	15	1	32
			Percent		50.0	46.9	3.1	100.0
3	6/1-6/7	Male	Number	6	27	15		48
			Percent	10.3	46.6	25.9		82.8
		Female	Number		3	7		10
			Percent		5.2	12.1		17.2
		Combined	Number	6	30	22		58
			Percent	10.3	51.7	37.9		100.0
4	6/8-6/14	Male	Number	14	61	23	2	100
			Percent	9.5	41.2	15.5	1.4	67.6
		Female	Number		21	25	2	48
			Percent		14.2	16.9	1.4	32.4
		Combined	Number	14	82	48	4	148
			Percent	9.5	55.4	32.4	2.7	100.0
5	6/15-6/21	Male	Number	6	38	11	1	56
			Percent	6.2	39.2	11.3	1.0	57.7
		Female	Number		20	19	2	41
			Percent		20.6	19.6	2.1	42.3
		Combined	Number	6	58	30	3	97
			Percent	6.2	59.8	30.9	3.1	100.0

-Continued-

Table 79. Sex and age composition of chinook salmon, Kwegooyuk test fishery, Kuskokwim River, 1980 (continued).

Sample Period	Date	Sex		Age 1.2	1.3	1.4	1.5	Total
6	6/22-6/28	Male	Number	6	53	9	1	69
			Percent	4.4	39.0	6.6	0.7	50.7
		Female	Number		35	30	2	67
			Percent		25.7	22.1	1.5	49.3
		Combined	Number	6	88	39	3	136
			Percent	4.4	64.7	28.7	2.2	100.0
7	6/29-7/5	Male	Number		14	2	1	17
			Percent		48.3	6.9	3.4	58.6
		Female	Number		3	9		12
			Percent		10.3	31.0		41.4
		Combined	Number		17	11	1	29
			Percent		58.6	37.9	3.4	100.0
8	7/6-7/12	Male	Number		10			10
			Percent		41.7			41.7
		Female	Number		4	10		14
			Percent		16.7	41.7		58.3
		Combined	Number		14	10		24
			Percent		58.3	41.7		100.0
Total	5/18-7/12	Male	Number	32	215	68	5	320
			Percent	6.1	41.0	13.0	1.0	61.0
		Female	Number		90	108	7	205
			Percent		17.1	20.6	1.3	39.0
		Combined	Number	32	305	176	12	525
			Percent	6.1	58.1	33.5	2.3	100.0

SOURCE: ADF&G. Arctic-Yukon-Kuskokwim Region Age, Sex, and Size Composition of Salmon (1961-1980).

YUKON RIVER

The Yukon River area includes the Yukon River and its tributaries in Alaska and the Yukon Territory, and all coastal waters from Canal Point light near Cape Stephans southward to the Naskonat Peninsula (Figures 8 and 9). Spawning populations of chinook salmon have been documented throughout the length of the Yukon, over 2,000 miles. Major chinook salmon producing tributaries include the Andreafsky and Anvik Rivers on the lower Yukon; the Salcha and Chena Rivers on the middle (upper Alaskan) Yukon; and the Nisutlin (Teslin River drainage) and Big Salmon Rivers on the upper (Canadian) Yukon. The Alaskan portion of the river is divided into fishing districts as follows: 334-10, 334-20, and 334-30 on the lower Yukon; and 334-40, 334-50, and 334-60 on the middle (upper Alaskan) Yukon. With the possible exception of a few fish harvested at the mouth or near adjacent coastal villages, only salmon of Yukon River origin are harvested in this area. Chinook salmon are of major importance in Yukon River fisheries, exceeded only by chum salmon in abundance, and ranking first in commercial importance. Major commercial and subsistence fisheries, as well as a smaller sport fishery, harvest chinook salmon at a number of areas within the Yukon drainage from the river mouth to the Yukon Territory.

Total abundance of Yukon River chinook salmon runs has not been consistently estimated although tagging studies conducted from 1966 to 1974 provided estimates of from 160,000 fish in 1969 to between 400,000 and 600,000 fish in 1974 (Table 80). Commercial catches in the lower portion of the river (subdistricts 334-10 and 334-20) and subsistence catches throughout the drainage are felt to be a function of the relative size of the total return (as gauged through catch per unit of effort) and are thought to roughly reflect relative run strength (Tables 81 and 82). Total utilization of Yukon River chinook salmon has been relatively stable although recent (since 1979) commercial and subsistence catches have increased significantly. Commercial catches during most of the 1970's were relatively depressed from previous levels, when poor returns prompted restrictive management measures.

Most chinook salmon taken in the Yukon area are commercially harvested (1961-1979 average 103,000 fish). Most of the harvest takes place in a directed gill net fishery in the lower 200 miles of the river, subdistricts 334-10 and 334-20 (1961-1979 average 72,000 and 21,000 fish, respectively). Since 1961, catch quotas have been dropped in these subdistricts and regulation has been accomplished by scheduled weekly fishing periods. Fishing time has decreased from 4 days per week in the early 1960's to 2-1/2 days per week in 1977 in response to increased fishing effort and efficiency. Directed effort for chinook salmon (no mesh size restrictions) opens June 10 and closes by emergency order in late June or early July. Virtually all chinook harvested in these districts have been age 1.3 and 1.4 fish. The remaining commercial effort in the middle and upper portions of the Yukon is mostly by fishwheel and gill net fisheries targeting on chum salmon. Chinook salmon are of minor importance to these fisheries with the upper Alaskan subdistricts (334-40, 334-50, and 334-60) having a total guidelines harvest range allocation of from 4,500 to 5,500 chinook (1975-1979 average harvest 880; 3,300; and 820 fish respectively). There is a small commercial fishery at Dawson in the Yukon Territory (1975-1979 average 4,100 fish). The catch distribution within the upper subdistricts in Alaska is generally a

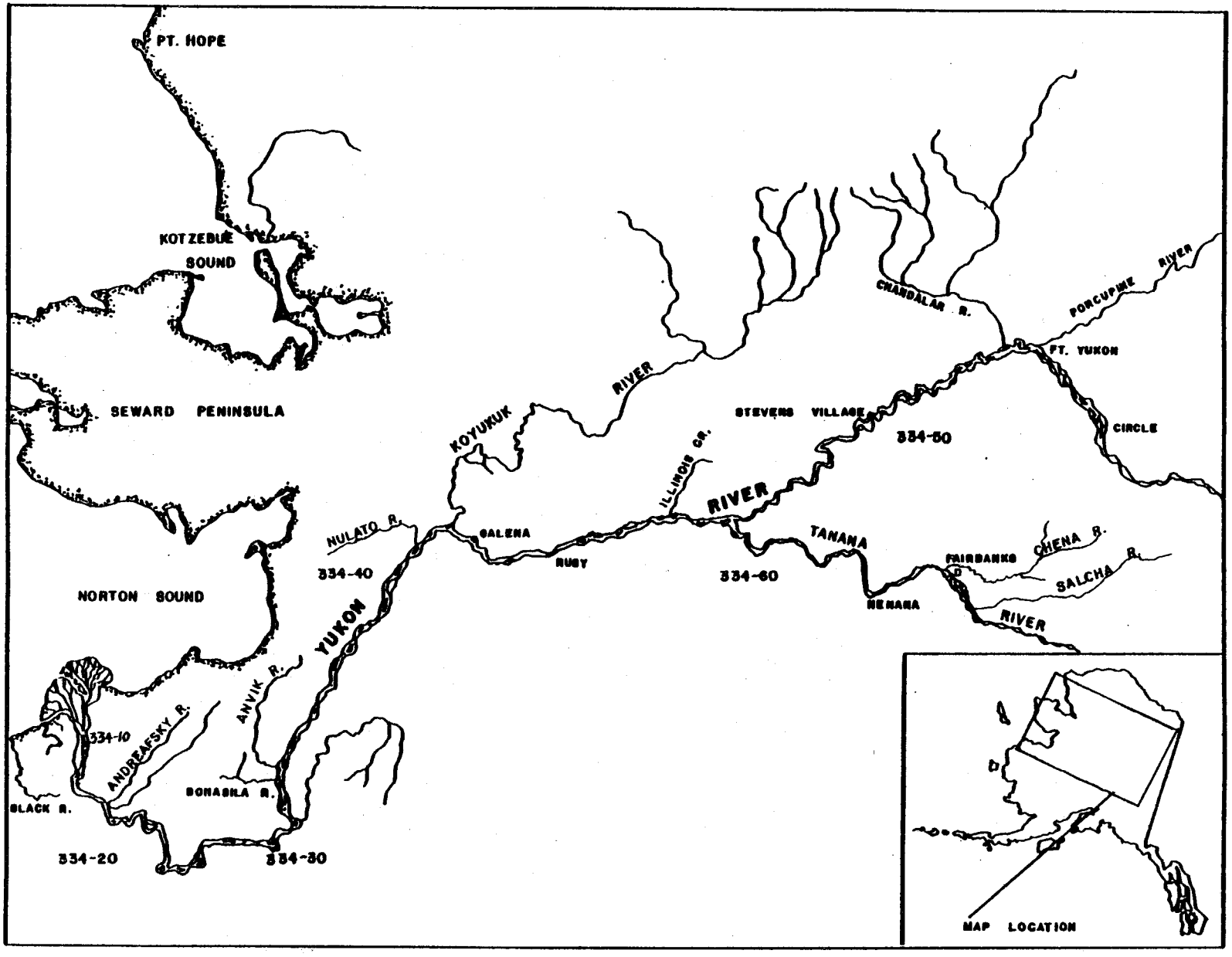

Figure 8. Alaskan portion of the Yukon River.

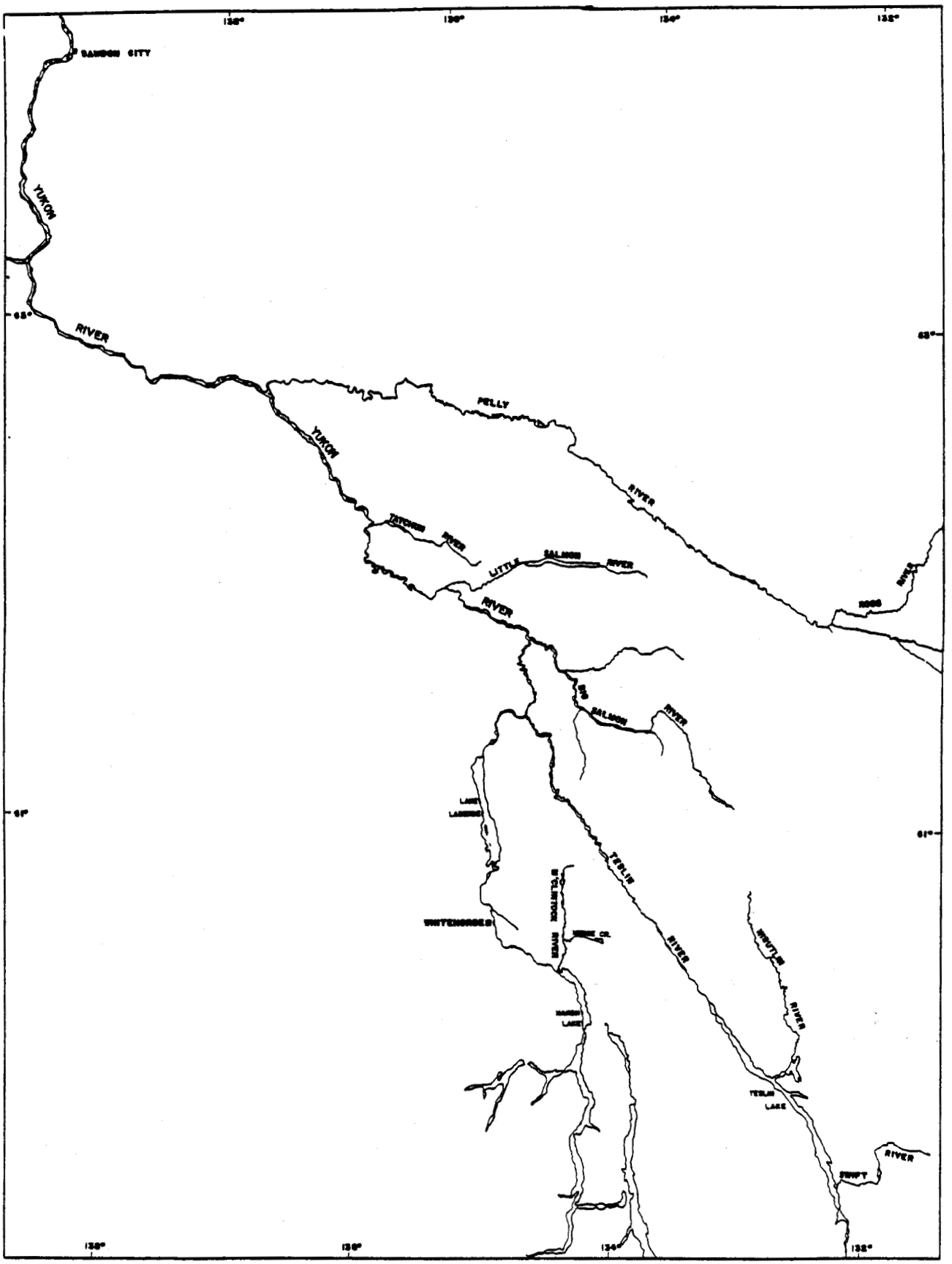

Figure 9. Canadian portion of the Yukon River.

function of the individual subdistrict guideline harvest levels rather than of effort or susceptibility to harvest.

Subsistence catches have averaged 23,000 fish and have remained relatively constant during the period 1961-1979. Individual subdistrict catches in Alaska generally increase from the lower (subdistrict 334-10) to the upper (subdistrict 334-50) portions of the river. Most of the subsistence harvest takes place in Alaska (1961-1979 average 19,000 fish) with smaller catches in the Yukon Territory (1961-1979 average 3,900 fish). Sport catches of chinook salmon are primarily from the Salcha River near Fairbanks (Tanana River drainage) and have averaged 200 fish annually during the period 1977-1979 (Table 83).

Total Yukon River system chinook escapement is not estimated. Post-season indices of escapement are constructed from aerial surveys of selected tributaries (Tables 84 and 85). Although comparison between areas and years is complicated because of differential stream and survey conditions, these indices are being developed for use as indicators of the escapement magnitude and distribution. Aerial surveys suggest that the Tanana River drainage (primarily the Salcha and Chena Rivers) is consistently the largest producer of Yukon chinook salmon. Recent expansion of the aerial surveillance program in the Canadian Yukon drainage hints that chinook salmon production from these upper river tributaries (primarily the Teslin, Big Salmon, and Pelly River drainages) is much larger than historical aerial survey counts. Total escapement to the uppermost portions of the Yukon is counted at the Whitehorse fishway (Table 85). Chinook salmon escapement past Whitehorse was extremely depressed during most of the 1970's. Escapements in 1978 (725 fish) and 1979 (1,184 fish) have equaled or surpassed historic records.

Age 1.3 and 1.4 fish are the dominant age classes in lower river commercial and test fish catches (Tables 86-113). Determination of trends in age composition is impractical as the figures presented in these tables are totals and not necessarily proportional to actual catches. Age, sex, and size composition of escapements in selected tributaries also show mostly age 1.3 and 1.4 fish although the percentage of age 1.2 fish (jacks) is usually much higher than observed in the commercial fishery.

A record total of 221,000 chinook salmon were harvested in the Yukon River area in 1980. The 1980 run was judged to be above average in magnitude resulting in record commercial (162,000 fish), subsistence (58,000) and sport (940) catches.

Most of the harvest was taken in the lower river commercial fishery where 706 vessels delivered 88,000 fish in subdistrict 334-10 and 51,000 fish in subdistrict 334-20. The timing of the run entering the mouth of the Yukon was early for the second consecutive year and permitted openings one to two days early in the lower management districts. Catches peaked in the third week of June in subdistricts 334-10 and 334-20. Age composition of the lower river commercial catch (8-1/2 inch mesh gillnet samples) was primarily composed of age 1.3 (47%) and 1.4 (49%) fish. A record catch of 9,500 fish was made in the Dawson fishery in Canada.

Record subsistence harvests were recorded in subdistricts 334-40 (10,000 fish), 334-50 (18,000 fish), and the Yukon Territory (16,000 fish). Large subsistence catches throughout the drainage verified the large magnitude of the 1980 run. Upper Yukon Alaskan catches accounted for approximately 50% of the total subsistence harvest. The Canadian harvest far exceeded the recent 5-year average of 2,900 fish.

Aerial survey counts indicated average to above-average escapements in all major chinook salmon spawning tributaries. Record escapements were documented in the Andreafsky (2,500), Giasa (950), Tozitna (260), Chena (2,500), Salcha (6,800), Tatchun (220), and Teslin (3,300) Rivers. The 1,391 fish counted through the Whitehorse fishway was the highest since 1962. In 1980, escapement sampling for age, sex, and length in major spawning tributaries was expanded and verified the dominance of age 1.3 and 1.4 fish in the run. In general, percent composition of age 1.2 and 1.3 fish decreased from lower to upper tributaries while the percentage of age 1.4 fish was highest in the upper tributaries.

Table 80. Population estimates of chinook salmon from tagging studies, Yukon River drainage, 1961-1974.

Year	Portion of run1/	Location of tagging site	Method2/	Estimate or estimate range (Number of fish)
1961	2	River Mile 763	1	17,000
1962	2	River Mile 763	1	22,400
1963				
1964				
1965				
1966	1	River Mile 0	2	310,000 - 342,000
1967	1	River Mile 0	2	397,000 - 600,000
1968	1	River Mile 185	2	190,000
1969	1	River Mile 185	2	161,000
1970	1	River Mile 185	2	227,000
1971				
1972				
1973	3	River Mile 1,289	1	29,000
1974	3	River Mile 1,289	1	11,100 - 36,700

1/ Portion of run: 1 - Entire run.
2 - Upriver of Rampart.
3 - Run into Yukon Territory excluding the Porcupine River.

2/ Method: 1 - Tag recovery with only recoveries at agency fishing sites.
2 - Tag recovery and commercial - subsistence harvests.

SOURCES: USFWS. Rampart Canyon Dam and Reservoir Project (1961-1962).

ADF&G. Annual Management Report, Arctic-Yukon-Kuskokwim Area (1961-1962).

ADF&G. Arctic-Yukon-Kuskokwim Area Anadromous Fish Investigations (1967-1971).

ECFMS. Distribution and Abundance of Chinook and Chum Salmon in the Upper Yukon River System as Determined by a Tagging Program (1973-1974).

Table 81. Yukon River commercial chinook salmon catches by subdistrict and year, and selected period averages, 1961-1980.

	Number of Fish								
	Alaska Subdistrict							Canada	
Year	334-10	334-20	334-30	334-40	334-50	334-60	Total	Yukon Territory	Area Total
1961	84,463	29,028	4,965	-	-	-	120,260	3,446	123,706
1962	67,099	22,224	4,687	-	-	-	94,734	4,037	98,771
1963	85,004	24,211	6,976	-	-	-	116,994	2,283	119,277
1964	67,555	20,246	4,705	-	-	-	93,587	3,208	96,795
1965	89,268	23,763	3,204	-	-	-	118,098	2,265	120,363
1966	70,788	16,927	3,612	-	-	-	93,315	1,942	95,257
1967	140,350	20,289	3,618	-	-	-	129,706	2,187	131,893
1968	79,465	21,392	4,543	-	-	-	106,526	2,212	108,732
1969	70,862	14,799	3 577	-	-	-	90,223	1,640	91,863
1970	57,681	17,210	3,712	-	-	-	80,269	2,611	82,880
1971	86,042	19,226	3,490	-	-	-	110,507	3,178	113,685
1972	70,052	17,855	3,841	-	-	-	92,840	1,769	94,609
1973	56,981	13,859	3,204	-	-	-	75,353	1,871	77,224
1974	71,680	17,947	3,471	685	2,663	1,473	97,919	2,214	100,133
1975	44,585	11,187	4,207	389	2,872	500	63,740	3,000	66,740
1976	62,632	17,413	4,239	385	2,900	1,102	88,671	3,500	92,171
1977	69,456	16,781	3,943	959	4,267	1,008	96,414	4,620	101,034
1978	57,890	32,335	2,917	701	3,115	644	97,602	2,975	100,577
1979	76,269	41,357	5,108	1,969	3,520	833	129,056	6,175	135,231
1980 1/	87,789	50,824	5,240	1,521	5,338	2,076	152,788	9,500	162,288
1975-1979 Avg.	62,166	23,815	4,083	881	3,335	817	93,097	4,054	99,151
1970-1979 Avg.	65,327	20,517	3,813	2/	2/	2/	92,237	3,191	96,428
1961-1979 Avg.	72,217	20,950	4,016	2/	2/	2/	99,253	2,902	102,681

1/ Preliminary.
2/ Insufficient data.

SOURCES: ADF&G. Annual Management Report 1980 Yukon Area (1961-1980).
ADF&G. Alaska Salmon Catches, 1878-1981 (1961-1980).

Table 82. Yukon River subsistence chinook salmon catches by subdistrict and year, and selected period averages, 1961-1980.

Number of Fish

Year	Alaska Subdistrict 334-10	334-20	334-30	334-40	334- 50	Other 1/	Total	Canada Yukon Territory	Area Total
1961	772	4,938	4,211	2,762	8,148	657	21,488	10,376	31,864
1962	406	1,732	1,752	1,255	5,658	307	11,110	10,500	21,610
1963	1,610	6,494	4,515	3,722	7,790	731	24,862	8,108	32,970
1964	328	2,093	3,428	3,884	5,669	829	16,231	6,646	22,877
1965	783	2,780	3,744	3,057	5,802	442	16,608	3,115	19,723
1966	1,242	1,506	3,445	1,881	3,015	483	11,572	2,700	14,272
1967	2,704	4,178	4,895	2,322	1,955	434	16,488	3,213	19,661
1968	477	1,555	3,588	2,326	3,463	697	12,106	2,900	15,006
1969	3,179	2,225	2,584	3,500	1,887	625	14,000	1,000	15,000
1970	2,250	2,168	2,671	2,736	3,154	895	13,874	2,100	15,974
1971	2,995	6,336	3,871	4,641	4,628	3,213	25,684	2,800	28,044
1972	1,788	4,720	3,334	3,805	5,379	1,232	20,258	1,647	21,868
1973	2,811	4,853	5,095	4,530	6,146	882	24,317	2,116	26,433
1974	1,459	2,923	3,486	6,644	3,367	2,085	19,964	3,379	23,343
1975	497	1,375	4,890	3,750	1,377	1,156	13,045	3,000	15,645
1976	1,355	2,866	2,820	4,057	5,069	1,639	17,806	1,523	19,329
1977	750	1,668	2,559	4,605	6,129	1,870	17,581	2,807	20,388
1978	5,246	3,964	3,902	4,955	10,391	1,067	27,391	2,906	30,297
1979	2,879	4,268	3,263	6,639	11,997	1,959	31,005	4,200	35.205
1980	3,669	3,674	4,783	10,456	17,524	2,618	42,724	15,500	58,224
1975-1979 Avg.	2,145	2,828	3,487	4,801	6,993	1,538	21,366	2,887	24,173
1970-1979 Avg.	2,203	3,514	3,589	4,636	5,764	1,600	21,092	2,648	23,653
1961-1979 Avg.	1,765	3,297	3,582	3,741	5,317	1,116	18,705	3,949	22,606

1/ Includes Koyukuk, Innoko, Chandlar, and Tanana River catches.

SOURCE: ADF&G. Annual Management Report 1980 Yukon Area (1961-1980).

Table 83. Tanana River drainage sport chinook salmon catch by year and location and 1977-1979 average, 1977-1980.

	Number of Fish		
Year	Salcha R.	Other	Total
1977	62	38	100
1978	105	38	163
1979	476	39	515
1980	904	37	941
1977-1979 Avg.	214	45	259

1/ Sport catches of chinook salmon harvested elsewhere in the Yukon drainage area are included with Kuskokwim River drainage catches and tabulated with Kuskokwim area data.

Table 84. Yukon River chinook salmon escapement counts by location and year, 1961-1980[1/].

Number of Fish

Year	Canadian Drainages									
					Teslin River Drainage					
	Tatchun Creek	Pelly River Drainage	Big[3/] Salmon River	Little Salmon River	Nisutlin River[4/]	Other	Total	Takhini River	Whitehorse Dam	Other Yukon
1961									1,068	
1962									1,500	
1963								250	483	
1964									587	
1965									903	
1966	7[5/]G							94	563	83
1967						254	254		533	
1968		352	827[5/]	173	491	9	500		414	234[6/]
1969		7	286[5/]	120	105		105		434	
1970	100[5/]G	51	670		737	71	808		625	
1971	130G	50	200[5/]	275	1,000	1,000	2,000		856	198[6/]
1972	80G	109	560	162	283	312	595	17	391	220[6/]
1973	99G	34	75[5/]	27[5/]	42[5/]		42 [5/]		224	136
1974	192G		70[5/]			150	150	15	273	235
1975	175G	30	153[5/]		323	54	377	165	313	1,023[6/]
1976	52G		86[5/]		152		152	6[5/]	121	188
1977	150G		316[5/]	171	77		77	88[5/]	277	167
1978	200B		524	330	484		484	115[5/]	725	626[6/]
1979	150G		632	489[5/]	713	208	921	100	1,184	22
1980	222G	265	1,568	286[5/]	1,375	1,910	3,285	170	1,383	11

B = Boat
G = Ground

1/ All estimates are peak aerial counts except where otherwise indicated.
2/ 1972-1980 Anvik River counts are composite best available estimates from combined tower, sonar, aerial and boat surveys.
3/ Index area: Big Salmon L. - Souch Creek vicinity.
4/ Index area: Sidney Creek - 100 Mile Creek, and McNeil River - Nisutlin Lake.
5/ Incomplete or poor survey conditions resulting in a very minimal count.
6/ Includes fish from Big Salmon River outside of index area.

SOURCE: ADF&G. 1981. Yukon River Stream Catalog Salmon Escapements 1953-1981.

Table 85. Yukon River chinook salmon escapement counts by location and year, 1961-1980[1/].

Number of Fish

	Alaskan Drainages														
	Andreafsky River				Nulato River Drainage			Koyukuk River Drainage				Tanana River Drainage			
Year	East F.	West F.	Total	Anvik River[2/]	North F.	South F.	Total	Gisasa River	Other	Total	Tozitna River	Chena River	Salcha River	Other	Total
1961	1,003		1,003	1,226	376	167	543	266[5/]		266[5/]			2,878	402	3,280
1962	675[5/]	762[5/]	1,437[5/]									50B	937		987
1963												137			137
1964	867	705	1,572										450		450
1965		355[5/]	355[5/]	650[5/]									408	60	468
1966	361	303	664	638									800		800
1967		276[5/]	276[5/]	336[5/]											
1968	380	383	763	310[5/]									739	2	741
1969	231[5/]	274[5/]	505[5/]	296[5/]					49	49			461[5/]		461
1970	665	574[5/]	1,239	368								6[5/]G	1,882	245	2,133
1971	1,904	1,682	3,188						274	274		193[5/]B	158[5/]		351[5/]
1972	798	582[5/]	1,380	1,172								138[5/]B	1,193	34	1,365
1973	825	788	1,613	613								21	391	14	426
1974		285[5/]	285[5/]	471[5/]	55	23	78	161	52	213		1,035B	1,857	264	3,156
1975	993	421	1,414	720	123	81	204	385	350	735	202	316B	1,055	36	1,407
1976	818	643	1,461	1,155	471	177	648	332	249	581	42[5/]	531	1,641	83	2,255
1977	2,008	1,499	3,507	1,354	286	201	487	255	83	338	123	563	1,202	98	1,863
1978	2,487	1,062	3,549	1,328	498	422	920	45	156	201	194	1,726	3,499	94	5,319
1979	1,180	1,134	2,314	1,484	1,093	414	1,507	484		484		1,159	4,789		5,948
1980	958[5/]	1,500	2,458	1,330	954	369	1,323	951	93	1,044	257	2,541	6,757	37	9,335

B = Boat
G = Ground

1/ All estimates are peak aerial counts except where otherwise indicated.
2/ 1972-1980 Anvik River counts are composite best available estimates from combined tower, sonar, aerial and boat surveys.
3/ Index area: Big Salmon L. - Souch Creek vicinity.
4/ Index area: Sidney Creek - 100 Mile Creek, and McNeil River - Nisutlin Lake.
5/ Incomplete or poor survey conditions resulting in a very minimal count.
6/ Includes fish from Big Salmon River outside of index area.

SOURCE: ADF&G. 1981. Yukon River Stream Catalog Salmon Escapements 1953-1981.

Table 86. Sex and age composition of chinook salmon from lower Yukon River[1/] commercial catch samples taken with 8-1/2 inch mesh gillnets, Yukon River, 1964-1980.

Year	Number of Fish	Percent Composition							
		Sex		Age					
		Male	Female	1.1	1.2	1.3	1.4	1.5	1.6
1964	487	56.7	43.3		7.2	14.8	57.7	19.7	0.6
1965[3/]	584	56.2	43.8		1.0	19.0	56.0	23.5	0.5
1966[3/]	983	53.5	46.5		0.8	13.5	72.3	13.4	
1967[3/]	991	49.2	50.8		0.8	10.0	73.4	15.5	0.3
1968	1,335	45.0	55.0		2.6	12.8	64.5	20.1	
1969	1,225	47.3	52.7		1.6	17.2	70.4	10.3	
1970	1,231	58.7	41.3		10.0	42.5	42.4	5.1	
1971	961	52.8	47.2	0.1	0.6	29.1	68.9	1.3	
1972	723	37.2	62.8		0.8	13.0	79.5	6.7	
1973	1,021	53.3	46.7		0.4	18.2	75.5	5.9	
1974	1,053	54.2	45.8		0.4	20.1	68.6	10.9	
1975	824	54.1	45.9		7.4	39.5	36.2	16.9	
1976	904	53.4	46.6		4.0	41.0	51.5	3.5	
1977	711	42.1	57.9		0.1	17.3	78.3	3.8	
1978	675	47.0	53.0		9.3	10.4	74.1	6.2	
1979	903	62.8	37.2		7.4	41.9	39.1	11.6	
1980	932	53.9	46.1		1.6	47.1	49.1	2.2	

1/ District 334-10.
2/ Data from 5-1/2 inch mesh catches included in some years, 1964-1971.
3/ Includes some test fish catches.

SOURCES: ADF&G. Arctic-Yukon-Kuskokwim Region Age, Sex and Size Composition of Salmon (1961-1980).

Table 87. Sex and age composition of chinook salmon from lower Yukon River[1/] commercial catch samples taken with 5-1/2 inch mesh gillnets, Yukon River, 1972-1980.

Year	Number of Fish	Sex		Age				
		Male	Female	1.1	1.2	1.3	1.4	1.5
1972	18	61.7	38.9		5.6	44.4	44.4	5.6
1973	174	56.5	43.5		5.3	9.7	75.7	0.9
1974	168	86.3	13.7		43.5	37.5	17.3	0.2
1975	30	70.0	30.0		46.7	13.4	26.6	13.3
1976	141	50.4	49.6		5.7	41.1	47.5	4.9
1977	45	60.0	40.0		2.2	28.9	62.2	6.7
1978	320	50.6	49.4		19.4	8.1	70.0	2.5
1979	587	80.1	19.9	0.2	48.4	24.4	23.2	3.9
1980	462	66.0	34.0		17.1	47.0	34.4	1.5

1/ District 334-10.

SOURCES: ADF&G. Arctic-Yukon-Kuskokwim Region Age, Sex and Size Composition of Salmon (1961-1980).

Table 88. Sex and age composition of chinook salmon, test fisheries[1/], 8-1/2 inch mesh gillnets, Yukon River, 1969-1978.

Year	Number of Fish	Percent Composition						
		Sex		Age				
		Male	Female	1.1	1.2	1.3	1.4	1.5
1969	498	48.0	52.0		8.6	17.1	67.5	6.8
1970[2/]	605	66.4	33.6	0.2	10.0	45.8	40.0	4.0
1971	212	52.8	47.2	0.1	0.6	29.1	68.9	1.3
1972	532	44.0	56.0		1.2	21.2	70.7	6.9
1973	496	74.6	25.4		0.8	18.9	75.1	5.2
1974	99	74.7	25.3		4.0	12.1	71.8	12.1
1975								
1976[2/]	103	62.1	37.9		1.0	43.7	52.4	2.9
1977	183	42.1	57.9		1.1	24.1	72.1	2.7
1978	278	53.6	46.4		19.4	12.6	62.7	5.3
1979	84	42.9	57.1		2.4	35.7	46.4	15.5
1980	33	54.6	45.4		6.1	54.6	39.4	

1/ Samples from 1969-1978 taken at Flat Island. Samples from 1979-1980 taken at Big Eddy.
2/ Contains some commercial catch samples.

SOURCE: ADF&G. Arctic-Yukon-Kuskokwim Region Age, Sex and Size Composition of Salmon (1961-1980).

Table 89. Sex and age composition of chinook salmon, test fisheries[1/], 5-1/2 inch mesh gillnets, Yukon River, 1968-1980.

Year	Number of Fish	Percent Composition					
		Sex		Age			
		Male	Female	1.2	1.3	1.4	1.5
1968	146	51.3	48.7	4.8	9.0	69.8	16.4
1969	87	89.7	10.3	69.0	15.0	13.8	2.2
1970	103	87.4	12.6	61.2	26.2	10.7	1.9
1971	32	43.7	56.3	15.6	25.0	56.3	3.1
1972	18	61.1	38.9	5.6	44.4	44.4	5.6
1973	63	84.1	15.9	11.1	29.0	60.3	1.6
1974	37	78.4	21.6	48.7	24.3	16.2	10.8
1975	102	59.8	40.2	25.4	34.4	38.3	1.9
1976	86	58.1	41.9	15.1	41.9	38.4	4.6
1977	80	41.3	58.8	2.5	27.5	65.0	5.0
1978							
1979	54	35.2	64.8	42.6	38.9	9.3	9.3
1980	131	97.7	2.3	81.7	14.5	3.8	0.0

1/ Samples from 1968-1978 taken at Flat Island. Samples 1979-1980 taken at Big Eddy.

SOURCE: ADF&G. Arctic-Yukon-Kuskokwim Region Age, Sex and Size Composition of Salmon (1961-1980).

Table 90. Age and sex composition of chinook salmon taken in middle Yukon River commercial and subsistence catch samples, taken with 8-1/2 inch mesh gillnets, Yukon River, 1969-1980.

Year	Location	Number of Fish	Percent Composition						
			Sex		Age				
			Male	Female	1.1	1.2	1.3	1.4	1.5
1969	Tanana, Rampart 3/	116	69.0	31.0	1.7	22.4	16.4	48.3	11.2
1970	Nenana, Tanana, Rampart	104	90.4	9.6		49.0	37.5	11.5	2.0
1971	Paimuit 3/ 4/	610	65.6	34.4		14.3	48.7	30.8	6.2
1972	Tanana, Rampart 1/ 4/	122	56.5	43.5		1.6	27.9	69.7	0.8
1973	Rampart 2/ 4/	14	85.7	14.3		50.0	14.3	28.6	7.1
1974	Tanana 3/	18	61.1	38.9			11.1	77.8	11.1
1975	Nenana 3/	47	55.3	44.7		12.8	63.8	19.1	4.3
1976	Tanana 4/	110	52.7	47.3		4.5	39.0	52.7	3.8
	Rampart 4/	53	45.7	54.7		1.9	32.0	56.6	9.5
	Manley 4/	23	60.9	39.1		4.3	39.1	56.6	
1977	Nulato 2/ 4/	15	53.3	46.7			20.0	80.0	
	Nenana 2/ 4/	23	52.2	47.8			17.4	78.3	4.3
	Rampart 4/	52	50.0	50.0		9.6	11.6	76.9	1.9
	Eagle 4/	15	60.0	40.0		13.3	13.3	66.6	6.8
1978	Manley 4/	11	54.5	45.5			18.2	81.8	
1979	Tanana 4/	83	60.2	39.8		7.2	50.6	42.2	
1980	Anvik 4/	38	63.2	36.8		31.6	42.0	26.4	

1/ Includes some 5-1/2 inch mesh.
2/ No mesh size specified.
3/ Subsistence.
4/ Commercial.

SOURCE: ADF&G. Arctic-Yukon-Kuskokwim Region Age, Sex, and Size Composition of Salmon (1961-1980).

Table 91. Sex and age composition of chinook salmon taken from middle Yukon River commercial and subsistence fishwheel catch samples, Yukon River, 1967-1980.

Year	Location	Number of Fish	Percent Composition						
			Sex		Age				
			Male	Female	1.1	1.2	1.3	1.4	1.5
1967	Rampart 4/	25	64.0	36.0		16.0	40.0	36.0	8.0
1968									
1969									
1970	Nenana, Tanana, Rampart 3/	120	99.2	0.8	1.7	79.2	18.3	0.8	
1971	Tanana, Rampart 2/,	68	85.3	14.7		13.3	57.3	29.4	
	Eagle	705	66.5	33.5	0.4	9.4	44.1	45.8	0.5
1972	Tanana 2/	21	71.4	28.6		33.3	42.9	23.8	
1973	Ruby, Rampart 1/ 2/	16	62.5	37.5		12.5	25.0	56.5	6.0
1974									
1975	Galena 3/	60	40.0	60.0	1.7	55.5	25.0	16.6	1.7
1976	Galena 2/	8	37.5	62.5		12.5	25.0	62.5	
	Ruby 2/	12	66.7	33.3		33.3	41.7	25.0	
1977									
1978	Galena 1/ 4/	83	83.1	16.9	37.3	24.1	12.0	26.6	
1979	Galena 1/ 2/	78	75.6	24.4		24.4	34.6	41.0	
	Manley 1/ 2/	20	90.0	10.0		55.0	25.0	20.0	
1980	Galena 2/ 3/	142	47.9	52.1		15.5	58.5	26.0	

1/ Includes some gillnet catches
2/ Commercial.
3/ Subsistence.
4/ Unspecified.

SOURCE: ADF&G. Arctic-Yukon-Kuskokwim Region Age, Sex, and Size Composition of Salmon (1961-1980).

Table 92. Sex and age composition of chinook salmon taken from middle Yukon River commercial and subsistence fishwheel catches, at Nenana, Yukon River, 1970-1980.

Year	Number of Fish	Percent Composition						
		Sex		Age				
		Male	Female	1.1	1.2	1.3	1.4	1.5
1971 1/	103	68.0	32.0		20.4	45.6	34.0	
1972								
1973 1/	35	97.1	2.9	5.7	14.3	65.7	11.4	2.9
1974 1/	63	96.8	3.2		68.2	28.6	3.2	
1975 2/	154	81.2	18.8	2.6	59.7	28.6	7.8	1.3
1976								
1977 1/	27	59.3	40.7			26.0	74.0	
1978 1/	51	54.9	45.1		2.0	29.4	68.6	
1979 3/	47	89.4	10.6		61.7	25.0	20.0	
1980 1/2/	130	63.8	36.2		47.7	45.4	6.1	0.8

1/ Commercial.
2/ Subsistence.
3/ Unspecified.

SOURCES: ADF&G. Arctic-Yukon-Kuskokwim Region Age, Sex and Size Composition of Salmon (1961-1980).

Table 93. Sex and age composition of chinook salmon taken from commercial catches at Dawson, Yukon Territory, Yukon River, 1974-1980.

Year	Number of Fish	Percent Composition					
		Sex		Age			
		Male	Female	1.2	1.3	1.4	1.5
1974 1/2/				47.3	36.1	15.6	1.0
1975 3/	94	87.2	12.8	20.2	43.7	25.5	10.6
1975 1/	196	92.9	7.1	55.1	35.7	7.1	2.1
1976 1/	22	45.5	54.5	4.5	77.4	18.1	
1977							
1978							
1979							
1980 4/	219	63.0	37.0	2.7	43.8	50.2	3.2

1/ Fishwheel.
2/ Tagging sample.
3/ Gillnet.
4/ Unspecified.

SOURCES: ADF&G. Arctic-Yukon-Kuskokwim Region Age, Sex and Size Composition of Salmon (1961-1980).

Table 94. Sex and age composition of chinook salmon escapement, Anvik River, Yukon River, 1972-1980[1/].

Year	Number of Fish	Percent Composition					
		Sex		Age			
		Male	Female	1.2	1.3	1.4	1.5
1972	15	67.0	33.0		53.0	47.0	
1973	10	60.0	40.0	10.0		80.0	10.0
1974							
1975	8	75.0	25.0	12.0	62.0	25.0	
1976	45	73.0	27.0	13.0	67.0	20.0	
1977	117	50.0	50.0	3.0	28.0	64.0	5.0
1978	77	47.0	53.0	17.0	14.0	68.0	1.0
1979	46	80.0	20.0	37.0	30.0	26.0	7.0
1980	83	49.0	51.0	24.0	51.0	20.0	4.0

1/ Carcass samples.

SOURCES: ADF&G. Arctic-Yukon-Kuskokwim Region Age, Sex and Size Composition of Salmon (1961-1980).

Table 95. Sex and age composition of chinook salmon escapement, Salcha River, Yukon River, 1970-1980[1/].

Year	Number of Fish	Percent Composition						
		Sex		Age				
		Male	Female	1.1	1.2	1.3	1.4	1.5
1970	167	79.0	21.0		43.1	38.3	13.8	4.8
1971								
1972	293	44.7	55.3		7.5	7.5	81.6	3.4
1973	93	62.4	37.6		10.8	34.4	29.0	25.8
1974	208	75.0	25.0		44.0	11.0	41.0	3.0
1975	203	61.1	38.9	0.5	25.1	32.5	36.4	5.5
1976	150	58.7	41.3		14.0	43.3	40.0	2.7
1977	80	33.7	66.3			22.5	75.0	2.6
1978	79	51.9	48.1	1.3	15.2	20.3	63.2	0.0
1979	270	62.6	37.4	0.4	29.6	38.9	31.1	0.0
1980	275	55.3	44.7		18.5	45.1	34.2	2.2

1/ Carcass samples.

SOURCES: ADF&G. Arctic-Yukon-Kuskokwim Region Age, Sex and Size Composition of Salmon (1961-1980).

Table 96. Sex and age composition of chinook salmon escapement samples, Whitehorse Dam, Yukon River, 1970-1980[1/].

Year	Number of Fish	Percent Composition					
		Sex		Age			
		Male	Female	1.2	1.3	1.4	1.5
1970	99	86.8	13.2	29.3	52.5	15.2	3.0
1971	271	48.7	51.3	0.4	43.5	55.7	0.4
1972	52	46.2	53.8		19.3	73.1	7.6
1973	49	61.0	39.0		51.0	47.0	2.0
1974	86	60.0	40.0	14.0	26.0	55.0	5.0
1975							
1976	22	45.5	54.5	4.5	77.0	18.1	
1977	49	42.9	57.1		42.9	55.1	2.0
1978	54	53.7	46.3	3.7	40.8	55.5	
1980	1163[2/]	45.8	54.2				

1/ Fishway samples.
2/ No age data.

SOURCES: ADF&G. Arctic-Yukon-Kuskokwim Region Age, Sex and Size Composition of Salmon (1961-1980).

Table 97. Size composition of chinook salmon, lower Yukon River[1/] commercial catch samples taken with 8-1/2 inch mesh gillnets, Yukon River, 1962-1980.

Year	Mean Weight (lbs)[b/]	Length (mm)[a/] Males 1.1	1.2	1.3	1.4	1.5	2.5	Females 1.1	1.2	1.3	1.4	1.5	2.5
1962				730	866	1003					839	903	
1963													
1964	22.6		548	732	853	954	868		520	781	846	893	854
1965	23.0		519	724	854	960	865			748	844	912	813
1966	23.0		559	720	855	958	824			743	851	910	822
1967	24.0		546	739	864	946	840		600	745	851	892	843
1968	26.5		584	734	936	1000				788	880	945	
1969	23.9												
1970	22.3												
1971	22.6												
1972	24.6												
1973	24.5												
1974	23.4												
1975	22.0												
1976	21.7												
1977	23.3												
1978	23.8												
1979	20.7												
1980	21.2		596	766	912	1058				809	903	934	

1/ District 334-10.

SOURCES: a/ ADF&G. Arctic-Yukon-Kuskokwim Region Age, Sex and Size Composition of Salmon (1961-1980).
b/ ADF&G. Yukon Area Annual Management Report (1961-1980).

Table 98. Age, sex, and size composition of chinook salmon, lower Yukon River[1/] commercial catch samples taken with 8-1/2 inch mesh gillnets, Yukon River, 1980.

Sample period	Date	Sex		Age 1.2	1.3	1.4	1.5	Total
1	6/10	Male	Number	10	70	28		108
			Percent	5.4	37.4	15.0		57.8
			Avg. length, mm	618	767	908		790
		Female	Number		17	60	2	79
			Percent		9.1	32.1	1.1	42.3
			Avg. length, mm	808	908	938	938	888
		Combined	Number	10	87	88	2	187
			Percent	5.4	46.5	47.1	1.1	100.0
			Avg. length, mm	618	775	909	938	831
2	6/13	Male	Number	2	79	32	1	114
			Percent	1.0	41.6	16.8	0.5	60.0
			Avg. length, mm	545	768	915	958	807
		Female	Number		11	65		76
			Percent		5.8	34.2		40.0
			Avg. length, mm		806	898		884
		Combined	Number	2	90	97	1	190
			Percent	1.0	47.4	51.1	0.5	100.0
			Avg. length, mm	545	772	903	958	838
3	6/17	Male	Number	2	72	22	1	97
			Percent	1.1	39.6	12.1	0.6	53.3
			Avg. length, mm	566	766	896	1,075	794
		Female	Number		22	59	4	85
			Percent		12.1	32.4	2.2	46.7
			Avg. length, mm		818	906	951	885
		Combined	Number	2	94	81	5	182
			Percent	1.1	51.7	44.5	2.8	100.0
			Avg. length, mm	566	778	903	976	837
4	6/21	Male	Number	1	66	23	3	93
			Percent	0.5	35.9	12.5	1.6	50.5
			Avg. length, mm	540	763	936	1,105	815
		Female	Number		19	71	1	91
			Percent		10.3	38.6	0.5	49.5
			Avg. length, mm		805	899	970	880
		Combined	Number	1	85	94	4	184
			Percent	0.5	46.2	51.1	2.2	100.0
			Avg. length, mm	540	772	908	1071.3	847.1

-Continued-

Table 98. Age, sex, and size composition of chinook salmon, lower Yukon River[1/] commercial catch samples taken with 8-1/2 inch mesh gillnets, Yukon River, 1980 (continued).

Sample period	Date	Sex		Age 1.2	1.3	1.4	1.5	Total
5	6/24	Male	Number		58	28	4	90
			Percent		30.7	14.8	2.1	46.7
			Avg. length, mm		769	905	1,044	824
		Female	Number		25	70	4	99
			Percent		13.2	37.0	2.1	59.4
			Avg. length, mm		808	904	905	880
		Combined	Number		83	98	8	189
			Percent		43.9	51.8	4.2	100.0
			Avg. length, mm		781	904	974	853
Total	6/10-6/24	Male	Number	15	345	133	9	502
			Percent	1.6	37.0	14.0	1.0	53.9
			Avg. length, mm	596	766	912	1,058	805
		Female	Number		94	325	11	430
			Percent		10.1	34.9	1.2	46.1
			Avg. length, mm		809	903	934	883
		Combined	Number	15	439	458	20	932
			Percent	1.6	47.1	49.1	2.2	100.0
			Avg. length, mm	596	776	906	990	841

1/ District 334-20.

SOURCE: ADF&G. Arctic-Yukon-Kuskokwim Region Age, Sex, and Size Composition of Salmon (1961-1980).

Table 99. Age, sex, and size composition of chinook salmon, lower Yukon River[1/] commercial catch samples taken with 5-1/2 inch mesh gillnets, Yukon River, 1980.

Sample period	Date	Sex		Age 1.2	1.3	1.4	1.5	Total
1	6/27	Male	Number	13	14	2	1	30
			Percent	39.4	42.4	6.1	3.0	90.9
			Avg. length, mm	588	755	936	1,008	703
		Female	Number		2	1		3
			Percent		6.1	3.0		9.1
			Avg. length, mm		861	849		857
		Combined	Number	13	16	3	1	33
			Percent	39.4	48.5	9.1	3.0	100.0
			Avg. length, mm	588	768	907	1,008	717
2	7/1	Male	Number	27	66	25	1	119
			Percent	14.5	35.5	13.4	0.5	64.0
			Avg. length, mm	574	763	927	942	756
		Female	Number		21	46		67
			Percent		11.3	24.7		36.0
			Avg. length, mm		794	900		866
		Combined	Number	27	87	71	1	186
			Percent	14.5	46.8	38.2	0.5	100.0
			Avg. length, mm	574	770	909	942	796
3	7/5	Male	Number	25	65	24	2	116
			Percent	15.1	39.4	14.6	1.2	70.3
			Avg. length, mm	570	771	893	972	756
		Female	Number		13	33	3	49
			Percent		7.9	20.0	1.8	29.7
			Avg. length, mm		794	896	961	873
		Combined	Number	25	78	57	5	165
			Percent	15.1	47.3	34.6	3.0	100.0
			Avg. length, mm	570	775	895	966	791
4	7/8	Male	Number	13	21	2		36
			Percent	18.0	29.2	2.8		50.0
			Avg. length, mm	588	749	905		699
		Female	Number		13	23		36
			Percent		18.1	31.9		50.0
			Avg. length, mm		782	900		858
		Combined	Number	13	34	25		72
			Percent	18.0	47.2	34.7		100.0
			Avg. length, mm	588	762	901		779

-Continued-

Table 99. Age, sex, and size composition of chinook salmon, lower Yukon River[1/] commercial catch samples taken with 5-1/2 inch mesh gillnets, Yukon River, 1980 (continued).

Sample period	Date	Sex		Age 1.2	1.3	1.4	1.5	Total
5	7/25	Male	Number		2	1		3
			Percent		40.0	20.0		60.0
			Avg. length, mm		741	969		817
		Female	Number			2		2
			Percent			40.0		40.0
			Avg. length, mm			811		811
		Combined	Number		2	3		5
			Percent		40.0	60.0		100.0
			Avg. length, mm		741	863		814
6	7/31	Male	Number	1				1
			Percent	100.0				100.0
			Avg. length, mm	749				749
		Female	Number					
			Percent					
			Avg. length, mm					
		Combined	Number	1				1
			Percent	100.0				100.0
			Avg. length, mm	749				749
Total	6/27-7/31	Male	Number	79	168	54	4	305
			Percent	17.1	36.4	11.7	0.9	66.0
			Avg. length, mm	580	763	912	974	745
		Female	Number		49	105	3	157
			Percent		10.6	22.7	0.7	34.0
			Avg. length, mm		794	896	961	866
		Combined	Number	79	217	159	7	462
			Percent	17.1	47.0	34.4	1.5	100.0
			Avg. length, mm	580	770	901	968	786

1/ District 334-20.

SOURCE: ADF&G. Arctic-Yukon-Kuskokwim Region Age, Sex, and Size Composition of Salmon (1961-1980).

Table 100. Age, sex, and size composition of chinook salmon taken with 8-1/2 inch mesh gillnets, Big Eddy test fishery, Yukon River, 1980.

Sample period	Date	Sex		Age 1.2	1.3	1.4	1.5	Total
1	5/29-6/2	Male	Number		2	2	2	6
			Percent		22.2	22.2	22.2	66.7
			Avg. length, mm		900	935	1,410	1,081
		Female	Number		1	1	1	3
			Percent		11.1	11.1	11.1	33.3
			Avg. length, mm		850	915	1,000	932
		Combined	Number		3	3	3	9
			Percent		33.3	33.3	33.3	100.0
			Avg. length, mm		883	928	1,273	1,028
2	6/3-6/4	Male	Number		2			2
			Percent		40.0			40.0
			Avg. length, mm		873			873
		Female	Number		2	1		3
			Percent		40.0	20.0		60.0
			Avg. length, mm		822	865		836
		Combined	Number		4	1		5
			Percent		80.0	20.0		100.0
			Avg. length, mm		847	865		851
3	6/23-6/28	Male	Number	2	7	5	3	17
			Percent	4.1	14.3	10.2	6.1	34.7
			Avg. length, mm	649	801	884	1,010	844
		Female	Number		10	19	3	32
			Percent		20.4	38.8	6.1	63.5
			Avg. length, mm		839	891	953	881
		Combined	Number	2	17	24	6	49
			Percent	4.1	34.7	49.0	12.3	100.0
			Avg. length, mm	649	823	890	981	869
4	6/30-7/5	Male	Number		1	5	1	7
			Percent		7.1	35.7	7.1	50.0
			Avg. length, mm		822	883	971	887
		Female	Number		2	3	2	7
			Percent		14.3	21.4	14.3	50.0
			Avg. length, mm		780	908	963	887
		Combined	Number		3	8	3	14
			Percent		21.4	57.1	21.4	100.0
			Avg. length, mm		794	892	965	887

-Continued-

Table 100. Age, sex, and size composition of chinook salmon taken with 8-1/2 inch mesh gillnets, Big Eddy test fishery, Yukon River, 1980 (continued).

Sample period	Date	Sex		Age 1.2	1.3	1.4	1.5	Total
5	7/7-7/12	Male	Number		3	1		4
			Percent		42.9	14.3		57.1
			Avg. length, mm		774	950		818
		Female	Number			2	1	3
			Percent			28.6	14.3	42.9
			Avg. length, mm			893	965	917
		Combined	Number		3	3	1	7
			Percent		42.9	42.9	14.3	100.0
			Avg. length, mm		774	912	965	860
Total	5/29-7/12	Male	Number	2	15	3	6	36
			Percent	2.4	17.9	15.5	7.1	42.9
			Avg. length, mm	649	820	897	1,136	891
		Female	Number		15	26	7	48
			Percent		17.9	31.0	8.3	57.1
			Avg. length, mm		829	893	964	884
		Combined	Number	2	15	39	13	84
			Percent	2.4	17.9	46.4	15.5	100.0
			Avg. length, mm	649	824	894	1,044	887

SOURCE: ADF&G. Arctic-Yukon-Kuskokwim Region Age, Sex, and Size Composition of Salmon (1961-1980).

Table 101. Age, sex, and size composition of chinook salmon taken with 5-1/2 inch mesh gill nets, Big Eddy test fishery, Yukon River, 1980.

Sample period	Date			Age 1.2	1.3	1.4	1.5	Total
1	6/2	Male	Number	1				1
			Percent	100.0				100.0
			Avg. length, mm	612				612
		Female	Number					
			Percent					
			Avg. length, mm					
		Combined	Number	1				1
			Percent	100.0				100.0
			Avg. length, mm	612				612
2	6/6	Male	Number	4	2	1	1	8
			Percent	28.6	14.3	7.1	7.1	57.1
			Avg. length, mm	620	775	945	970	743
		Female	Number	3	2	1		6
			Percent	21.4	14.3	7.1		42.9
			Avg. length, mm	631	754	788		698
		Combined	Number	7	4	2	1	14
			Percent	50.0	28.6	14.3	7.1	100.0
			Avg. length, mm	624	765	867	970	724
3	6/7-6/14	Male	Number	5	4		1	10
			Percent	12.8	10.3		2.6	25.6
			Avg. length, mm	617	795		1,040	730
		Female	Number	10	13	3	3	29
			Percent	25.6	33.3	7.7	7.7	74.4
			Avg. length, mm	620	750	933	1,014	751
		Combined	Number	15	17	3	4	39
			Percent	38.5	43.6	7.7	10.3	100.0
			Avg. length, mm	619	761	933	1,021	746
Total	6/2-6/14	Male	Number	10	6	1	2	19
			Percent	18.5	11.1	1.9	3.7	35.2
			Avg. length, mm	618	788	945	1,005	729
		Female	Number	13	15	4	3	35
			Percent	24.1	27.8	7.4	5.6	64.8
			Avg. length, mm	622	751	897	1,014	743
		Combined	Number	23	21	5	5	54
			Percent	42.6	38.9	9.3	9.3	100.0
			Avg. length, mm	620	761	907	1,011	738

SOURCE: ADF&G. Arctic-Yukon-Kuskokwim Region Age, Sex, and Size Composition of Salmon (1961-1980).

Table 102. Age, sex, and size[1/] composition of chinook salmon, Dawson commercial catch samples, Yukon River, 1980.

Sample period	Date	Sex		Age 1.2	1.3	1.4	1.5	Total
1	7/9-8/9	Male	Number	6	74	53	5	138
			Percent	2.7	33.8	24.2	2.3	63.0
			Avg. length, mm	581	694	828	880	747
		Female	Number		22	57	2	81
			Percent		10.0	26.0	0.9	37.0
			Avg. length, mm		702	804	859	777
		Combined	Number	6	96	110	7	219
			Percent	2.7	43.8	50.2	3.2	100.0
			Avg. length, mm	581	696	816	874	759

1/ Mid-eye to hyperal plate.

SOURCE: ADF&G. Arctic-Yukon-Kuskokwim Region Age, Sex, and Size Composition of Salmon (1961-1980).

Table 103. Age, sex, and size[1/] composition of chinook salmon escapement, Andreafsky River, Yukon River, 1980[2/].

Location	Date	Sex		Age 1.2	1.3	1.4	1.5	Total
West Fork	8/8-8/12	Male	Number	6	22	3		31
			Percent	14.6	53.7	7.3		75.6
			Avg. length, mm	552	694	756		673
		Female	Number		4	4	2	10
			Percent		9.8	9.8	4.9	24.4
			Avg. length, mm		751	824	737	777
		Combined	Number	6	26	7	2	41
			Percent	14.5	63.4	17.1	4.9	100.0
			Avg. length, mm	552	703	794	737	698
East Fork	8/19-8/23	Male	Number	10	5	1		16
			Percent	38.5	19.2	3.9		61.5
			Avg. length, mm	528	678	884		597
		Female	Number		7	3		10
			Percent		26.9	11.5		38.5
			Avg. length, mm		749	814		768
		Combined	Number	10	12	4		26
			Percent	38.5	46.2	15.4		100.0
			Avg. length, mm	528	719	831		663
Total	8/8-8/23	Male	Number	16	27	4		47
			Percent	23.8	40.3	6.0		70.2
			Avg. length, mm	537	691	788		647
		Female	Number		11	7	2	20
			Percent		16.4	10.5	4.9	29.9
			Avg. length, mm		749	820	737	773
		Combined	Number	16	38	11	2	67
			Percent	23.8	56.7	16.5	4.9	100.0
			Avg. length, mm	537	708	808	737	685

1/ Mid-eye to hypural plate.

2/ Carcass samples.

SOURCE: ADF&G. Arctic-Yukon-Kuskokwim Region Age, Sex, and Size Composition of Salmon (1961-1980).

Table 104. Age, sex, and size composition of chinook salmon escapement, Anvik River, Yukon River, 1980 1/.

Date	Sex		Age 1.2	1.3	1.4	1.5	Total
8/5-8/20	Male	Number	20	21	1		42
		Percent	24.1	25.3	1.2		50.6
		Avg. length, mm	580	735	870		665
	Female	Number		21	17	3	41
		Percent		25.3	20.5	3.6	49.4
		Avg. length, mm		779	885	970	836
	Combined	Number	20	42	18	3	83
		Percent	24.1	50.6	21.7	3.6	100.0
		Avg. length, mm	580	757	884	970	750

1/ Carcass samples.

SOURCE: ADF&G. Arctic-Yukon-Kuskokwim Region Age, Sex, and Size Composition of Salmon (1961-1980).

Table 105. Age, sex, and size[1/] composition of chinook salmon escapement, Nulato River, Yukon River, 1980[2/].

Date	Sex		Age 1.2	1.3	1.4	1.5	Total
8/5-8/6	Male	Number	4	4	5		13
		Percent	19.0	19.0	23.8		61.9
		Avg. length, mm	519	679	834.2		689
	Female	Number		4	3	1	3
		Percent		19.0	14.3	4.8	38.1
		Avg. length, mm		725	814	824	771
	Combined	Number	4	8	8	1	21
		Percent	19.0	38.1	38.1	4.8	100.0
		Avg. length, mm	519	702	827	824	720

1/ Mid-eye to hypural plate.

2/ Carcass samples.

SOURCE: ADF&G. Arctic-Yukon-Kuskokwim Region Age, Sex, and Size Composition of Salmon (1961-1980).

Table 106. Age, sex, and size[1/] composition of chinook salmon escapement, Chena River, Yukon River, 1980[2/].

Date	Sex		Age 1.2	1.3	1.4	1.5	Total
8/11 - 8/20	Male	Number	14	15			29
		Percent	23.3	25.0			48.3
		Avg. length, mm	517	668			595
	Female	Number		15	16		31
		Percent		25.0	26.7		51.7
		Avg. length, mm		678	820		751
	Combined	Number	14	30	16		60
		Percent	23.3	50.0	26.7		100.0
		Avg. length, mm	517	673	820		676

1/ Mid-eye to hypural plate.

2/ Carcass samples.

SOURCE: ADF&G. Arctic-Yukon-Kuskokwim Region Age, Sex, and Size Composition of Salmon (1961-1980).

Table 107. Age, sex, and size[1/] composition of chinook salmon escapement, Salcha River, Yukon River, 1980[2/].

Date	Sex		Age 1.2	1.3	1.4	1.5	Total
	Male	Number	51	83	16	2	152
		Percent	18.5	30.2	5.8	0.7	55.3
		Avg. length, mm	515	677	821	895	641
	Female	Number		41	78	4	123
		Percent		14.9	28.4	1.5	44.7
		Avg. length, mm		710	814	888	782
	Combined	Number	51	124	94	6	275
		Percent	18.5	45.1	34.2	2.2	100.0
		Avg. length, mm	515	688	815	890	704

1/ Mid-eye to hypural plate.

2/ Carcass samples.

SOURCE: ADF&G. Arctic-Yukon-Kuskokwim Region Age, Sex, and Size Composition of Salmon (1961-1980).

Table 108. Age, sex, and size[1/] composition of chinook salmon escapement, Tatchun Creek, Yukon River, 1980[2/].

Date	Sex		Age 1.2	Age 1.3	Age 1.4	Total
9/7	Male	Number	1	1		2
		Percent	25.0	25.0		50.0
		Avg. length, mm	458	723		591
	Female	Number			2	2
		Percent			50.0	50.0
		Avg. length, mm			793	793
	Combined	Number	1	1	2	4
		Percent	25.0	25.0	50.0	100.0
		Avg. length, mm	458	458	793	692

1/ Mid-eye to hypural plate.

2/ Carcass samples.

SOURCE: ADF&G. Arctic-Yukon-Kuskokwim Region Age, Sex, and Size Composition of Salmon (1961-1980).

Table 109. Age, sex, and size[1/] composition of chinook salmon escapement, Michie Creek, Yukon River, 1980[2/].

Date	Sex		Age 1.2	Age 1.3	Age 1.4	Total
9/10	Male	Number	1	1		2
		Percent	33.3	33.3		66.7
		Avg. length, mm	485	715		600
	Female	Number			1	1
		Percent			33.3	33.3
		Avg. length, mm			756	756
	Combined	Number	1	1	1	3
		Percent	33.3	33.3	33.3	100.0
		Avg. length, mm	485	715	756	652

1/ Mid-eye to hypural plate.

2/ Carcass samples.

SOURCE: ADF&G. Arctic-Yukon-Kuskokwim Region Age, Sex, and Size Composition of Salmon (1961-1980).

Table 110. Age, sex, and size[1/] composition of chinook salmon escapement, Swift River, Yukon River, 1980[2/].

Date	Sex		Age 1.2	1.3	1.4	Total
	Male	Number		3		3
		Percent		30.0		30.0
		Avg. length, mm		680		680
	Female	Number		5	2	7
		Percent		50.0	20.0	70.0
		Avg. length, mm		717	746	725
	Combined	Number		8	2	10
		Percent		80.0	20.0	100.0
		Avg. length, mm		703	746	711

1/ Mid-eye to hypural plate.

2/ Carcass samples.

SOURCE: Arctic-Yukon-Kuskokwim Region Age, Sex, and Size Composition of Salmon (1961-1980).

Table 111. Age, sex, and size[1/] composition of chinook salmon escapement, Teslin River, Yukon River, 1980[2/].

Date	Sex		Age 1.2	1.3	1.4	1.5	Total
9/1	Male	Number		1		2	3
		Percent		7.7		15.4	23.1
		Avg. length, mm		681		878	812
	Female	Number		1	7	2	10
		Percent		7.7	53.8	15.4	76.9
		Avg. length, mm		725	854	884	847
	Combined	Number		2	7	4	13
		Percent		15.4	53.8	30.8	100.0
		Avg. length, mm		703	854	881	839

1/ Mid-eye to hypural plate.

2/ Carcass samples.

SOURCE: ADF&G. Arctic-Yukon-Kuskowkim Region Age, Sex, and Size Composition of Salmon (1961-1980).

Table 112. Age, sex, and size[1/] composition of chinook salmon escapement, Big Salmon River, Yukon River, 1980[2/].

Date	Sex		Age 1.2	1.3	1.4	1.5	Total
8/29-8/31	Male	Number	3	19	8		30
		Percent	2.8	17.9	7.6		28.3
		Avg. length, mm	541	691	829		713
	Female	Number		22	53	1	76
		Percent		20.8	50.0	0.9	71.7
		Avg. length, mm		738	820	868	797
	Combined	Number	3	41	61	1	106
		Percent	2.8	38.7	57.6	0.9	100.0
		Avg. length, mm	541	716	821	868	773

1/ Mid-eye to hypural plate.

2/ Carcass samples.

SOURCE: ADF&G. Arctic-Yukon-Kuskokwim Region Age, Sex, and Size Composition of Salmon (1961-1980).

Table 113. Age, sex, and size[1/] composition of chinook salmon carcasses, Nisutlin River, Yukon River, 1980[2/].

Date	Sex		Age 1.2	1.3	1.4	1.5	Total
9/2-9/4	Male	Number		7	3		10
		Percent		13.2	5.7		18.9
		Avg. length, mm		658	801		701
	Female	Number		14	26	3	43
		Percent		26.4	49.1	5.7	81.1
		Avg. length, mm		682	788	773	753
	Combined	Number		21	29	3	53
		Percent		39.6	54.7	5.7	100.0
		Avg. length, mm		674	789	773	743

1/ Mid-eye to hypural plate.

2/ Carcass samples.

SOURCE: ADF&G. Arctic-Yukon-Kuskokwim Region Age, Sex, and Size Composition of Salmon (1961-1980).

NORTON SOUND

The Norton Sound area encompasses the coastal waters and inland drainages from Cape Douglas to Cape Stephans (Figure 10). Major features of the district (roughly corresponding to commercial subdistricts) include: (1) the Nome River and adjacent coastal areas; (2) Golovin Bay and the several drainages which empty into it; (3) Kwiniuk River and Moses Point; (4) the Shaktoolik River and adjacent coastline; and (5) the Unalakleet River and coastal areas. The Shaktoolik and Unalakleet River subdistricts generate the highest production of chinook salmon, supporting small commercial, subsistence, and sport fisheries.

Chinook salmon are a minor component in Norton Sound fisheries. Most of the chinook salmon harvested in Norton Sound are taken in directed commercial gill net fisheries during early June in the Unalakleet and Shaktoolik subdistricts prior to the major chum salmon commercial fisheries (Table 114). Catches during the period 1964-1976 indicate that Norton Sound chinook salmon runs were depressed from previous levels. Catches remained stable during this period, ranging from 1,000 to 2,900 fish. Catches since 1977 have equaled or surpassed historical levels and suggest larger returns of Norton Sound chinook salmon. It is felt that the recent increased harvests in the Unalakleet Subdistrict may be partly ascribed to the interception of Yukon River chinook salmon. From 1961 to 1979, Unalakleet Subdistrict commercial harvests averaged 2,800 fish, 76% of the Norton Sound chinook salmon commercial catch average of 3,800 fish. Recently, this percentage has declined as catches increased in other subdistricts.

Subsistence catches averaged 580 fish yearly during the period 1964-1979, increasing slightly to a recent 5-year average of 640 fish (Table 115). During the period 1964-1979, subsistence catches from the Unalakleet Subdistrict averaged 470 fish, accounting for 84% of the total subsistence harvest in the area. Harvests from each of the other five subdistricts have seldom exceeded 100 fish. Annual sport fish catches in the region have averaged less than 250 fish since 1977 (Table 116).

Total escapement estimates for chinook salmon are not made although escapement to some rivers are monitored incidental to existing chum and pink salmon escapement surveys (Table 117). This information indicates that the Norton Sound chinook salmon resource is relatively small in comparison to other western Alaska chinook salmon runs. It is felt that recent increases in subsistence catches imply increased and adequate levels of escapement, particularly in the Unalakleet River.

Age 1.4 fish are the dominant age class in the Unalakleet commercial fishery (Tables 118-120).

A total of 7,800 chinook salmon were harvested in the Norton Sound area in 1980. The 1980 commercial harvest of 6,300 fish was close to the recent 5-year average of 5,900 fish and well above the 19-year average of 3,800 fish. Most of the harvest was taken in the Unalakleet Subdistrict, where 66 fishermen harvested 4,300 fish and the Shaktoolik Subdistrict, where 26 fishermen harvested 1,100 fish. Most of the record subsistence catch of 1,400 fish was also taken in the Unalakleet Subdistrict, with 1,100 fish harvested by 51 fishermen.

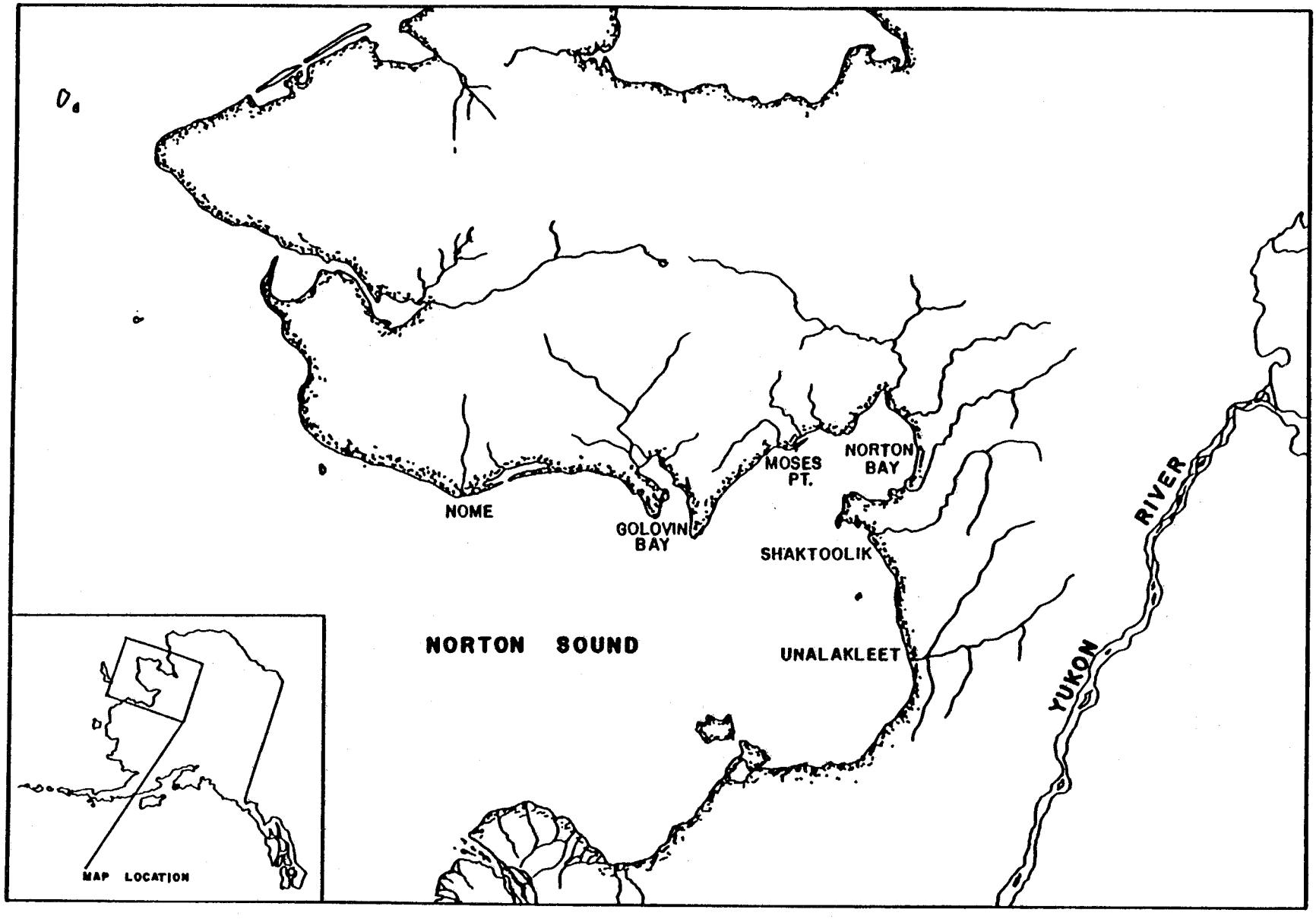

Figure 10. Norton Sound area.

Escapement monitoring in 1980 consisted of aerial surveys of Boston Creek (10 fish), the Tubutlik River (400 fish), the Shaktoolik River (150 fish), and the Unalakleet River (29 fish); and tower counts from the Kwiniuk River (180 fish). Chinook salmon escapements were judged to be average.

Table 114. Norton Sound commercial chinook salmon catches by subdistrict and year, and selected period averages, 1961-1980.

Year	Nome	Golovin	Moses Pt.	Norton Bay	Shaktoolik	Unalakleet	Total
1961					140	5,160	5,300
1962		45	27	387	1,738	5,089	7,286
1963		40	15	137	480	5,941	6,613
1964	5	27	32	50	631	1,273	2,018
1965	1				127	1,321	1,449
1966	1	17	17		310	1,208	1,553
1967		10			43	1,751	1,804
1968		12	12		61	960	1,045
1969		28	29	26	33	2,276	2,392
1970		13	39		197	1,604	1,853
1971	11	37	95		284	2,166	2,593
1972	15	36	190	43	419	2,235	2,938
1973		70	134	28	289	1,397	1,918
1974	19	30	198	21	583	2,100	2,951
1975	2	17	16	68	651	1,638	2,393
1976	2	12	24	102	892	1,211	2,243
1977	8	26	96	158	1,521	2,691	4,500
1978	19	22	444	470	1,339	7,525	9,819
1979	9	75	1,035	856	2,377	6,354	10,706
1980 2/	8	36	502	340	1,086	4,339	6,311
1975-1979 Avg.	8	30	323	331	1,356	3,883	5,932
1970-1979 Avg.	8	34	227	175	855	2,892	4,191
1961-1979 Avg.	1/	27	126	1/	638	2,837	3,756

1/ Insufficient data.

2/ Preliminary.

SOURCES: ADF&G. Norton Sound Area Annual Management Report (1961-1980).
ADF&G. Alaska Commercial Catches (1961-1980).

Table 115. Norton Sound subsistence chinook salmon catches by subdistrict and year, and selected period averages, 1961-1980.

Year	Nome	Golovin	Moses Pt.	Norton Bay	Shaktoolik	Unalakleet	Total
1961							
1962							
1963			5				5
1964					77	488	565
1965		2	16	4	31	521	574
1966	12	4	14	7	142	90	269
1967	11	3	39	12	162	490	817
1968	7	4	2	28	10	186	237
1969	2	2	9	59	40	324	436
1970		4	16	3	43	495	561
1971		7	16	5	87	911	1,026
1972	19	4	44	30	64	643	804
1973	14	1	2	1	51	323	392
1974	8	3	3		93	313	420
1975	2		2	1	18	163	186
1976	13		22	2	24	142	203
1977	35	3	22	14	49	723	846
1978	35	1	38	12	81	1,044	1,211
1979	11		16	12	62	640	747
1980	129	12	131	22	57	1,146	1,397
1975-1979 Avg.	19	1/	20	8	47	542	639
1970-1979 Avg.	14	1/	18	8	57	540	640
1964-1979 Avg.	11	1/	16	12	65	468	581

1/ Insufficient data.

SOURCES: ADF&G. Norton Sound Area Annual Management Report (1961-1980).

Table 116. Norton Sound sport chinook salmon catch estimates by year, and 1977-1979 average, 1977-1979.

Year	Number of Fish
1977	197
1978	303
1979	234
1980	52
1977-1979 average	245

SOURCE: ADF&G. Alaska Statewide Sportfish Harvest Studies (1977-1980).

Table 117. Norton Sound chinook salmon escapement counts by drainage and year, 1961-1980[1/].

Year	Mudyutok River		Tubutulik River	Kwiniuk River[2/]	Shaktoolik River	Unalakleet River
	Boston Creek	Fish River				
1961		1				
1962		48	3			
1963	67	21	9			
1964	10					
1965						
1966	153	7				
1967		20	1			
1968	7	10				
1969	100		3			
1970	246	33				
1971	42	1				
1972	57			35		
1973	153	31	131	57		
1974	225	3	136	62		
1975	147	26		44		
1976				12[3/]		
1977	76	7		84		
1978		29		74		
1979	58	11	69[4/]	107		
1980	16		404	177	147	29

1/ Peak aerial survey counts unless otherwise noted.
2/ Tower count.
3/ Tower put in 12 days late.
4/ Poor survey conditions.

SOURCE: ADF&G. Norton Sound Area Annual Management Report (1961-1980).

Table 118. Sex and age composition of chinook salmon, Unalakleet Subdistrict commercial catch samples[1/], Norton Sound, 1969-1980[a/].

				Percent Composition 2/						
		Sex		Age						
Year	Number	Male	Female	1.1	1.2	1.3	2.2	1.4	1.5	1.6
1969	55	70.9	29.1		34.5	20.0	3.6	29.2	12.7	
1970	82	79.3	20.7		47.6	30.5		22.0		
1971	507	58.7	41.3		29.9	26.3		43.8		
1972	95	74.0	26.0		7.0	47.0		42.0	4.1	
1973										
1974	140	65.0	35.0	0.3	11.5	25.4		26.1	34.0	2.7
1975	116	70.6	29.4		4.2	28.5		32.6	27.8	6.9
1976	127	61.4	38.6		7.9	64.6		27.5		
1977	177	44.6	55.4		2.3	23.2		69.5	5.0	
1978										
1979 3/	204	56.4	43.6		12.7	21.1		57.5	8.7	
1980 b/	137	54.0	45.3		6.6	29.2		54.1	9.5	

1/ Includes samples from 5-1/4 inch mesh gill nets.
2/ Weighted by commercial catch.
3/ Unweighted total.

SOURCES: a: ADF&G. Arctic-Yukon-Kuskokwim age, sex, and size composition of salmon annual summaries, (1969-1980).

b: Calculated from original data forms, unpublished data.

Table 119. Size composition of chinook salmon, Unalakleet Subdistrict commercial catch samples, Norton Sound, 1967-1980[1/].

		Length (mm) a/													
		Males							Females						
Year	Mean Weight (lb) b/	1.1	1.2	1.3	2.2	1.4	1.5	1.6	1.1	1.2	1.3	2.2	1.4	1.5	1.6
1967	23.7														
1968	20.0														
1969	19.3		603	729	645	729	1010				852		880	941	
1970	16.9		598	728		898				839	853		900		
1971	16.8		580	765		869				611	754		877		
1972	20.0		536	734		854	850				752		864	870	
1973	20.3		507	761		823	875				768		853	902	
1974	18.2	350	548	596		643	850	952			578		814	886	888
1975	10.8		561	604		661	782	872					692	805	856
1976	15.2		562	692		858							744	751	
1977	22.7		559	767		885	933				776		885	922	
1978	22.8														
1979	22.9		591	766		887	929			589	761		882	960	
1980 c/	21.5		607	767		889	999				813		896	944	

1/ Includes samples from 5-1/4 to 8-1/2 inch mesh gillnets.

SOURCES: a: ADF&G. Arctic-Yukon-Kuskokwim region age, sex, and size composition of salmon annual summaries (1967-1980).

b: ADF&G. Norton Sound Area Annual Management Report (1967-1980).

c: Lengths calculated from original data forms, unpublished data.

Table 120. Age, sex, and size composition of chinook salmon, Unalakleet Subdistrict commercial catch samples, Norton Sound, 1980.

Date	Sex	Sample Period		Age 1.2	1.3	1.4	1.5	Total
6/19-7/1	Males	1	Number	9	34	28	4	75
			Percent	6.6	24.8	20.4	2.9	54.7
			Avg. Length	607	767	889	999	806
6/19-7/1	Females	1	Number		6	47	9	62
			Percent		4.4	34.3	6.6	45.3
			Avg. Length		813	896	944	895
6/19-7/1	Combined	1	Number	9	40	74	13	137
			Percent	6.6	29.2	54.7	9.5	100.0
			Avg. Length	607	774	893	961	846

SOURCES: Unpublished data. From original data forms.

SUMMARY AND DISCUSSION

An estimated 870,000 chinook salmon were harvested in Alaska in 1980 (Table 124). Although total return to most of these systems is not estimated, a total of 102,000 fish were observed in the escapement.

The commercial harvest of 682,000 fish was nearly 80% of the total (Table 121). Southeastern Alaska has historically contributed the single largest commercial catch of chinook salmon in the state and the 1980 harvest of 323,000 fish was 47% of the statewide commercial catch. Because of the many mixed stocks in Southeastern Alaska fisheries, however, it is impractical to relate this catch to the total return of chinook salmon to Southeastern Alaska. Commercial catches in the Cordova area (8,700 fish) and Cook Inlet (12,900 fish) were well below those observed in recent years. These harvests are incidental to other salmon fisheries and it is unclear how to relate them to the total chinook return in these areas. Record commercial catches were reported in the Westward Region (24,500 fish) and the Yukon area (162,300 fish); and catches were large in Bristol Bay (95,700 fish), the Kuskokwim area (48,200 fish), and Norton Sound (6,300 fish). Since catches in most of these fisheries are regulated according to perceived run size, it is felt that these catches reflect increased returns to most western Alaska systems in 1980.

It is estimated that a record number of 138,000 chinook were taken in subsistence fisheries in 1980 (Table 122). Most of these fish (86%) were harvested in the Kuskokwim (60,000 fish) and Yukon (58,000 fish) drainages where most of the subsistence catch has occurred in the past. In addition to these large catches, record subsistence harvests in Bristol Bay (14,000 fish) and Norton Sound (1,400 fish) all point toward increased returns to western Alaska systems. Subsistence catches are not closely monitored in the Westward Region (70 chinook reported) and it is recognized that this figure is a minimal estimate. Subsistence catches were carefully followed in the Cook Inlet area (1,900 fish) for the first time in 1980. The subsistence catch in Prince William Sound (2,300 fish) was similar to the large harvests observed in recent years.

An estimated total of 47,000 fish was taken by sport fishermen in 1980 (Table 123). This total is similar to statewide harvests since 1977, the first year that a statewide total was estimated. Most of the sport catch was taken in Southeastern Alaska (20,000 fish) and the Cook Inlet area (17,000 fish). In addition to the record catch in Southeastern Alaska, record sport catches were also reported in the Bristol Bay area (4,200 fish), and the Kuskokwim (880 fish), and Yukon (940 fish) drainages. The Cook Inlet area sport catch of 17,000 fish was somewhat below that of recent years. However, it is felt that this decreased harvest is primarily attributable to poor weather.

Due to the variable conditions under which aerial escapement counts are obtained, it is difficult to determine historical trends. The largest number of fish directly observed in any single area escapement was in Bristol Bay (33,000 fish). Large numbers of fish were also observed in Kuskokwim (19,000 fish) and Yukon (23,000 fish) escapements. Inclement weather precluded aerial surveys in the Susitna River drainage in 1980. The 19,000 fish total observed in Southeastern Alaska is a summation from many different river systems.

Total escapement was estimated in several river systems in 1980. In Bristol Bay and the north side of the Alaska Peninsula, aerial survey data was expanded to total (record) escapement estimates of 153,000 and 17,726 fish, respectively. It is important to note, however, that methodology for determination of these expansions is variable and the precision of these estimates is unknown. Side-scan sonar escapement estimates were made in the Copper (7,300 fish), Nushagak (56,000 fish), and Kuskokwim (Aniak River only; 56,500 fish) Rivers. The validity of these estimates is questionable as the side-scan sonar equipment used does not have sufficient range to count all migrating chinook salmon. However, the sonar estimates agree with aerial observations in that escapement to the Copper River drainage appears to be much less than escapements to the major western Alaska systems.

Age, size, and sex sampling of chinook salmon catches and escapements has not been consistent and analysis of many collections is incomplete. While age is usually determined by visual scale annuli counts, it is often assumed that all chinook salmon rear for two years in fresh water. Therefore, many of the age distributions listed here are actually determinations of ocean age only. It appears that 4-ocean fish are the most common age class in all Alaskan chinook salmon systems, closely followed by 3-ocean fish. For most escapement samples, the percentage of 2-ocean fish was much higher than that observed in the commercial catch.

Meaningful comparisons of total return between individual chinook salmon systems are difficult to make at this time. Based on observed numbers of fish in the catch and escapement, Southeastern Alaska would be expected to have the largest return in the State. However, it is not known what percentage of the catch originates in systems outside Alaska. The comparatively large number of fish observed in the escapement indicates that the total return to the entire area is significant. Relatively few fish were observed in the Copper River catch and escapement and it is felt that total return to this system is not as large as to other major chinook salmon systems. Relatively few fish were observed in the Cook Inlet catches and escapements. However, historical escapement observations, particularly in the Susitna River system, have been comparatively large. Also, the majority of the Cook Inlet catch is taken by the sport fishery and the rate of exploitation is probably less than that of a directed commercial fishery.

Expanded estimates of total return to the Westward Region and direct observations in Norton Sound indicate that these stocks are relatively small. Based on observed numbers of fish, the Yukon River system supports the single largest run of chinook salmon in the State. The numbers of fish observed in the Kuskokwim and Bristol Bay drainages were very similar. However, it seems probable that the exploitation rate of subsistence fisheries is lower than that of the commercial fisheries which suggests that the Yukon and Kuskokwim runs may be substantially larger than the harvests suggest.

Table 121. Alaska commercial chinook salmon catches by year and area, 1961-1980.

	Number of Fish								
Year	South-eastern Alaska	Cordova Area	Cook Inlet Area	Westward Region	Bristol Bay	Kuskokwim Area	Yukon Area	Norton Sound	Total
1961	229,588	8,893	19,778	8,273	88,656	23,246	123,706	5,300	507,440
62	205,561	16,838	20,270	10,230	84,047	20,867	98,771	7,286	463,870
63	258,482	13,266	17,632	7,530	62,269	18,571	119,277	6,613	503,640
64	357,191	12,877	4,622	8,001	139,536	21,320	96,795	2,018	642,360
65	287,233	16,493	9,751	10,578	112,967	24,965	120,363	1,449	583,799
1966	308,144	12,158	9,603	8,229	77,472	25,823	95,257	1,553	538,239
67	300,987	13,473	8,035	8,944	117,193	29,986	131,893	1,804	612,315
68	331,614	11,276	4,600	8,510	103,723	43,157	108,732	1,045	612,663
69	313,899	17,424	12,462	12,389	124,908	64,777	91,863	2,392	640,114
70	322,592	20,432	8,455	7,314	140,511	65,082	82,880	1,853	649,119
1971	356,304	20,142	19,838	7,330	123,015	44,936	113,685	2,593	687,843
72	286,829	23,003	16,174	4,864	69,546	55,482	94,609	2,938	553,445
73	343,741	22,638	5,339	6,125	44,044	51,374	77,224	1,918	552,403
74	346,625	20,602	6,779	6,397	45,644	30,670	100,133	2,951	559,827
75	300,707	22,325	4,933	2,850	29,992	27,799	66,740	2,393	457,739
1976	241,711	32,755	11,317	8,529	95,968	49,262	92,171	2,243	533,956
77	285,220	22,864	15,189	7,296	130,526	58,256	101,034	4,500	624,885
78	401,424	30,435	19,055	19,831	191,539	63,194	100,577	9,819	835,874
79	367,620	20,078	14,951	22,371	201,835	53,314	135,231	10,706	826,106
80	323,270	8,735	12,898	24,454	95,708	48,242	162,288	6,311	681,906

Table 122. Alaska subsistence chinook salmon catch estimates by year and area, 1961-1980.

	Number of Fish								
Year	South-eastern Alaska 1/	Cordova Area	Cook Inlet Area	Westward Region	Bristol Bay	Kuskokwim Area	Yukon Area	Norton Sound	Total
1961		449				30,910	31,864		63,223
62		892	45			14,642	21,610		37,189
63		470	29		4,100	37,246	32,970	5	74,820
64		739			3,400	30,853	22,877	565	58,434
65		656			5,100	31,143	19,723	574	57,196
1966		602	8		4,300	53,606	14,272	269	73,057
67		502	4		4,200	61,224	19,661	817	86,408
68		655	10		7,100	34,986	15,006	237	57,994
69		735			7,500	43,732	15,000	436	67,403
70		493	3	751	7,200	71,376	15,974	561	96,358
1971		1,373	2	405	4,600	45,465	28,044	1,026	80,915
72		1,650	1	2,017	4,500	43,335	21,868	804	74,175
73		2,009		307	7,200	41,697	26,433	392	78,038
74		1,146	1	237	9,900	29,590	23,343	420	64,637
75		1,705	5	211	8,600	51,045	15,645	186	77,397
1976		2,018	16	104	8,400	60,603	19,329	203	90,673
77		2,181	2	126	7,000	58,163	20,388	846	88,706
78		2,087	5	50	8,100	38,209	30,297	1,211	79,959
79		2,417	158	111	10,300	57,283	35,205	747	106,221
80		2,275	1,936	67	14,100	59,900	58,224	1,397	137,899

1/ Insufficient data.

Table 123. Alaska chinook salmon sport catch estimates by year and area, 1961-1980.

	Number of Fish								
Year	South-eastern Alaska	Cordova Area	Cook Inlet Area	Westward Region	Bristol Bay	Kuskokwim Area	Yukon Area	Norton Sound	Total
1961	828		1,417						2,245
62	520		857		358				1,735
63	2,234		3,342		581				6,157
64	2,780				361				3,141
65	1,789			70					1,859
1966	4,093		834		1,000				5,927
67	2,407		862		1,579				4,848
68	4,972		1,022	150	2,203				8,347
69	5,090	500	607		4,631				10,828
70	4,087	600	1,618		2,730				9,035
1971	6,875	700	1,376		2,417				11,368
72	9,317		3,205	179	1,668				14,369
73	6,189		1,780		1,000				8,969
74	3,565	900	6,590	87	1,700				12,842
75	1,277	697	6,126	265	427				8,792
1976	2,184	296	14,588	114	800				17,952
77	17,449	960	20,936	883	2,733	177	100	197	43,060
78	16,639	734	21,399	571	3,923	629	163	303	44,149
79	16,581	3,290	26,471	1,098	3,498	400	515	234	51,749
80	20,213	2,403	17,251	671	4,174	878	941	52	46,583

Table 124. Alaska chinook salmon harvest by area and type, and escapement estimates by area, 1980.

Location	Number of Fish					
	Harvest				Escapement	
	Commercial	Subsistence	Sport	Total	Observed	Expanded
Southeastern Alaska	323,270	1/	20,213	343,483	19,471	8/
Cordova Area	8,735	2,275	2,403	13,413	1,746	7,318 3/
Cook Inlet Area	12,898	1,936	17,251	32,085	5,027	8/
Westward Region	24,454	67	671	25,192	4/	17,726
Bristol Bay	95,708	14,100	4,174	113,982	33,210	153,000
Kuskokwim Area	48,242	59,900	878	109,020	19,080 5/	72,462 6/
Yukon Area	162,288	58,224	941	221,453	22,937 7/	8/
Norton Sound	6,311	1,397	52	7,760	773	8/
Total	681,906	137,899	46,583	866,388	102,244	

1/ Insufficient data.
2/ Aerial survey data.
3/ Sonar estimate
4/ Data not available.
5/ Includes weir data.
6/ Sonar and aerial data (minus aerial data from the Aniak River system).
7/ Includes fishway data.
8/ No expansion of data.

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