SUMMARY REPORT OF COOK INLET SALMON STOCK AND THEIR UTILIZATION

and

SUMMARY OF COOK INLET SUBSISTENCE SALMON FISHERY

to

ALASKA BOARD OF FISHERIES

March 1981

by

Cook Inlet Staff

333 Raspberry Rd.
Anchorage, Alaska

SUMMARY REPORT OF COOK INLET SALMON STOCKS AND THEIR UTILIZATION

INTRODUCTION

Increasing demand for Cook Inlet salmon by recreational and subsistence fishermen combined with a continued high utilization by commercial fishermen, has resulted in intense competition for this resource and a growing antagonism between these user groups.

It is critical that long term management direction be determined for the Cook Inlet salmon resources. This direction must take into account the needs of the major user groups, the ability of the resource base to meet those needs, and the ability of managers to manipulate the fisheries to optimize the harvest and meet management goals. What this report attempts to describe are the salmon resources available to satisfy user group needs by species and area.

Based on long term historical catch averages, Cook Inlet natural salmon runs make up about 5% of the statewide production capability. By comparison, the number of commercial fishermen holding entry permits to fish in Cook Inlet is about 14% of the statewide total for salmon net fishing and nearly half of all Alaskan recreational anglers fish in Cook Inlet. The Cook Inlet basin contains about half of the statewide human population, with the bulk of it in the Anchorage area. The effects of urbanization, while probably still not a major factor in the overall status of Cook Inlet salmon runs, has definitely impacted certain drainages and streams. While

many areas in Cook Inlet are still remote, probably more salmon streams are accessible by road than any other area in the state, which means that the salmon populations in these streams are accessible to a large number of potential harvesters.

The waters of Cook Inlet are turbid and many major rivers are glacial or muddy, making timely assessment of both runs and escapements extremely difficult. All five species of salmon enter Cook Inlet, with considerable overlap in timing and migration routes. Separation by stock component in the commercial fishery is not well defined. Knowledge of the escapement requirements by major stock and drainage is limited and specific forecasts for individual stocks are not available.

The number of participants in the Cook Inlet commercial fishery and the efficiency of this fishery has increased greatly since the 1950's. This number has now been fixed by the limited entry program. In 1980 there were 94 seine, 545 drift gillnet and 686 set gillnet permits issued for Cook Inlet. Future growth would only be allowed if there were a large increase in the runs due to better natural survival or increased artifical production. Cook Inlet angling pressure, however, has no such limitation and is currently estimated to be growing at some 3% per year.

Subsistence fishing permits have dramatically increased in Cook Inlet since 1977 (Table 1). Depending upon the Board of Fisheries interpretation and implementation of the Subsistence priority statutes, this user group could make a significant impact on certain salmon stocks.

TABLE 1. SUBSISTENCE SALMON FISHERY PERMITS ISSUED IN COOK INLET
(1969 - 1980)

YEAR	LOWER COOK INLET	UPPER COOK INLET		
	SOUTH DISTRICT	CENTRAL DISTRICT	NORTHERN DISTRICT	TOTAL
1969	47	40	290	377
1970	78	45	290	413
1971	112	28	9 1/	149 1/
1972	135	21	9	165
1973	143	104	19	266
1974	147	97	12	256
1975	292	97	17	406
1976	242	90	21	353
1977	197	73	10	280
1978	311	297	26	634
1979	437	121	1,040	1,598
1980 2/	533	526 3/	693 4/	1,752

1/ KNIK ARM CLOSED TO SUBSISTENCE FISHING.

2/ HOUSEHOLD PERMITS WERE ISSUED IN 1980 WHEREAS INDIVIDUAL PERMITS WERE ISSUED PRIOR TO 1980.

PRELIMINARY DATA.

3/ DOES NOT INCLUDE 85 PERMITS ISSUED FOR SPECIAL OPENINGS OF THE UPPER SUBDISTRICT.

4/ DOES NOT INCLUDE 65 PERMITS ISSUED FOR THE SPECIAL KING SALMON FISHERY AT TYONEK.

OVERVIEW OF THE SALMON RESOURCE IN COOK INLET

The scope of this report covers only those Cook Inlet salmon stocks and fisheries north of Anchor Point. The commercial fishery in the Southern, Kamishak, and Outer Districts operates on different stocks of fish with only minimal interception of stocks bound to the upper Inlet. Only a small part of Cook Inlet commercial fishing gear (94 seine permits and 35 set net permits) are located in this southern area. While recreational angling and subsistence fishing opportunities do exist in this area, the major current area of resource competition is for salmon of the upper Inlet. We do not mean to imply that critical management allocation decisions will not be needed in Lower Cook Inlet at some future time.

The northern part of the commercial fishing area is known as the gill net districts. The upper Inlet is a large muddy body of water, with tremendous tidal currents and fluctuations. Salmon pass through this area during the months of May through September to reach their freshwater spawning streams. The major salmon spawning tributaries are shown in Figure 1. The major runs occur in the month of July. There are generally three primary salmon production areas in the upper Inlet: the west side, the Susitna drainage, and the Kenai Peninsula. Figure 2 depicts the timing of major runs through the Inlet. King salmon are the first species to enter the Inlet and are the least abundant. Recent commercial catches do not adequately reflect total abundance of king salmon because the major run bound to the Susitna River is not being targeted on by a commercial fishery at present. The Susitna run begins about the latter part of May, peaks the second week in June, and is usually over by June 25. This is the largest king salmon run in the Inlet. The second largest producer is the Kenai River. Timing of the main, or late, Kenai run

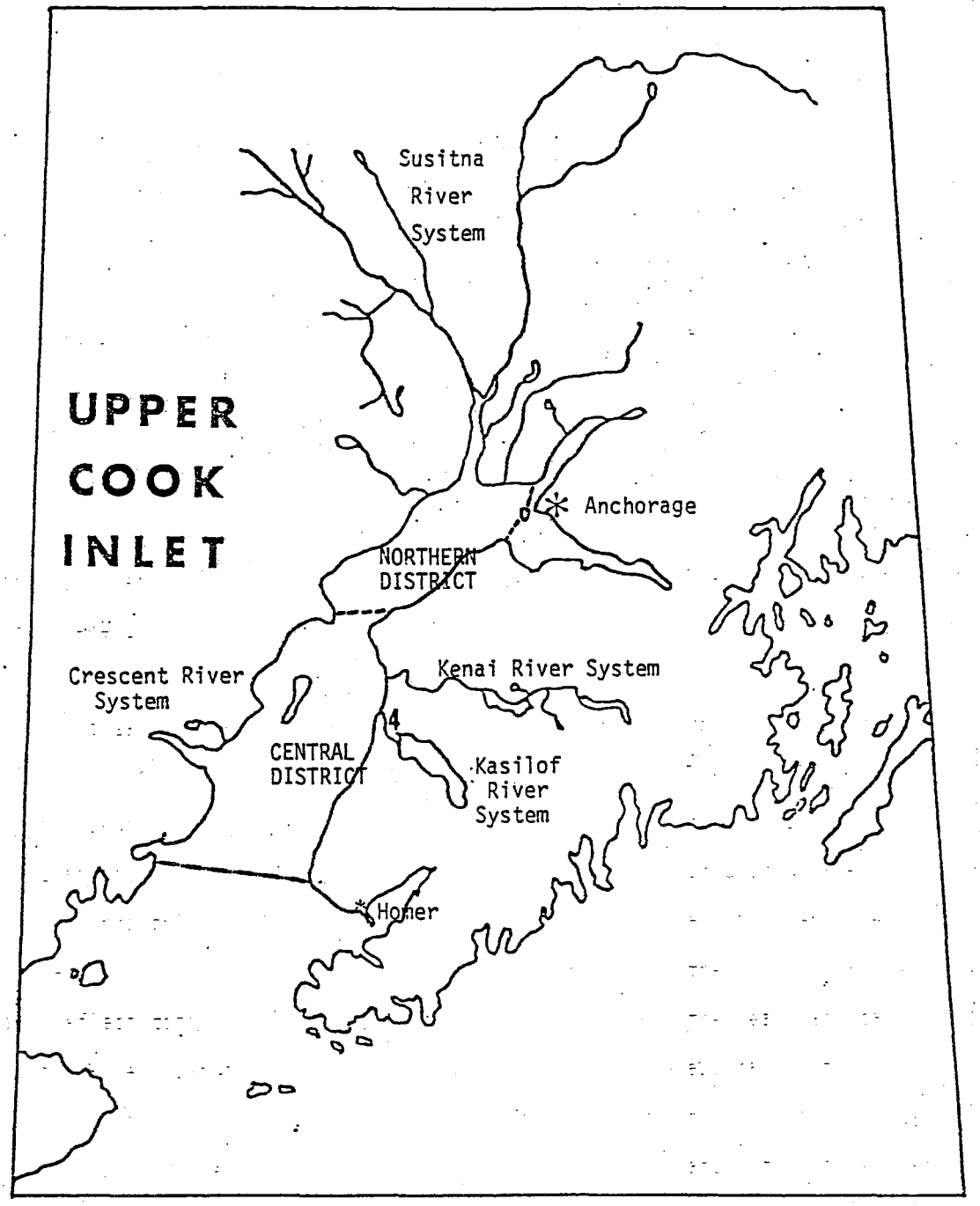

Figure 1. Upper Cook Inlet showing major sockeye salmon producing river systems and commercial fishing districts.

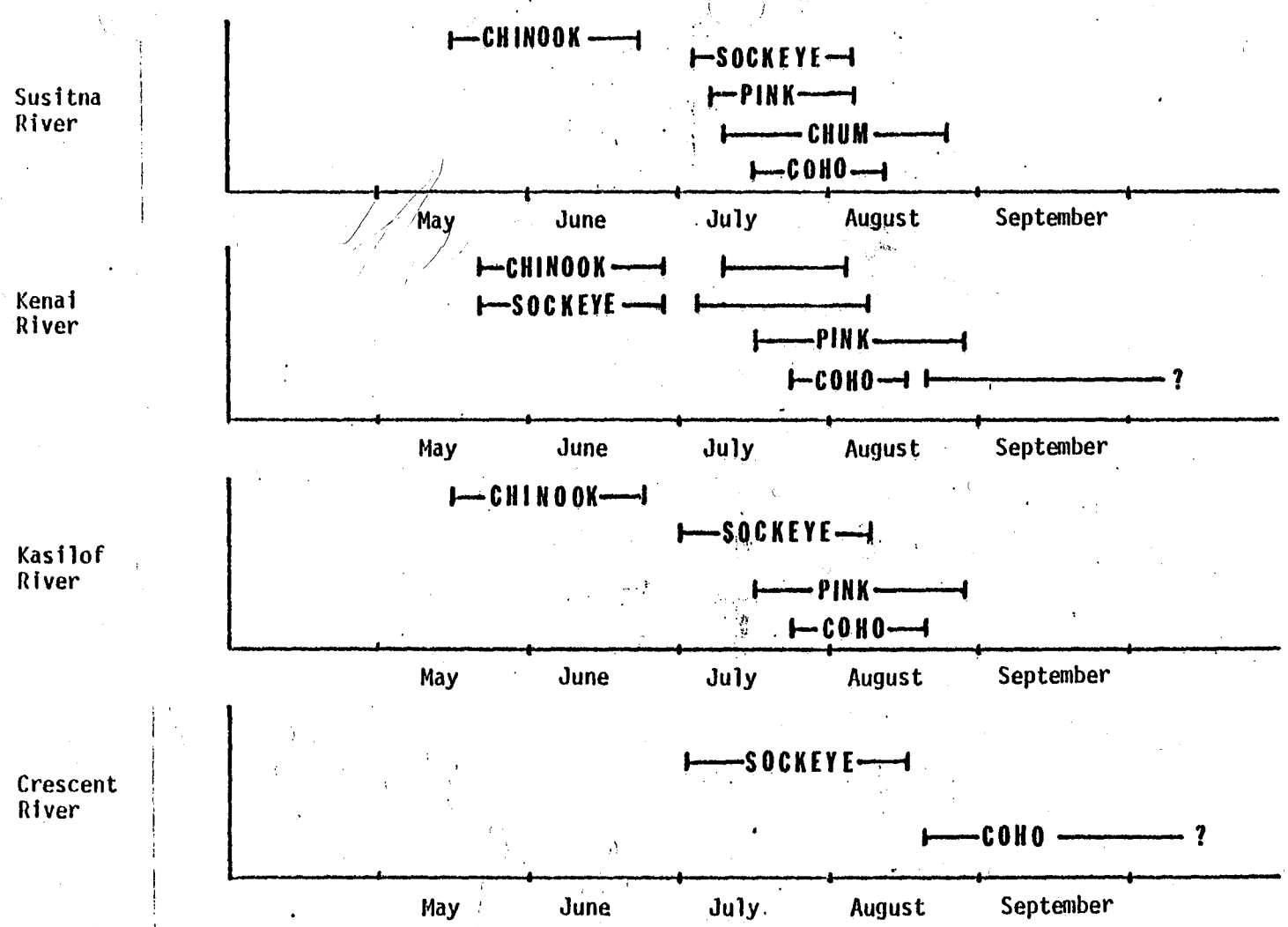

Figure 2. COOK INLET SALMON RUN TIMING CHARACTERISTICS

overlaps that of other species to a much greater degree, beginning the first week in July, peaking around the 20th of July, and ending the first week in August.

King salmon have suffered the worst decline since the period of peak harvests (Table 2). A major reason for recent low catch levels is due to the fact that commercial fishing has been sharply restricted since about 1964 on this species. Nevertheless, catches were declining prior to that and the status of the stocks was assumed to be poor, particularly in the case of the major Susitna run. A reversal of this trend has been evident in escapement levels to the Susitna River from 1976 to present.

Sockeye salmon are the most consistently abundant species and the mainstay of the commercial fishery. In order of importance, the main sockeye producers in Cook Inlet are the Kenai, Susitna, Kasilof and Crescent River systems. Many minor systems produce sockeye on the west side of Cook Inlet, the upper part of Knik Arm, and on the Kenai Peninsula. Sockeye run timing is characterized by two general time periods. The first run partially overlaps the early Susitna and early Kenai king salmon runs, beginning in late May, peaking in mid-June, and over by the latter part of June. This run is primarily bound for the Russian River and is insignificant in numbers compared to the later run. The main runs destined for the Susitna,Kenai, Kasilof, and Crescent Rivers that pass through Cook Inlet begins in early July, peaks between July 15 and 20, and are over by the first week in August.

Sockeye harvests during 1960-1975 also declined significantly from the period of peak harvest period (Table 2). The 1976-80 average harvest, however, was larger than the historical peak period, and the 1978 harvest of 2.6 million sockeye is the largest catch on

Table 2. UPPER COOK INLET COMMERCIAL CATCHES, 1960-1980

Year	King	Sockeye	Coho	Pink	Chum	Total
1960	27,512	923,314	311,461	1,411,605	659,997	3,333,889
1961	19,737	1,162,303	117,778	34,017	349,628	1,683,463
1962	20,210	1,147,573	350,324	2,711,689	970,582	5,200,378
1963	17,536	942,980	197,140	30,436	387,027	1,575,119
1964	4,531	970,055	452,654	3,231,961	1,079,084	5,738,285
1965	9,741	1,412,350	153,619	23,963	316,444	1,916,117
1966	9,541	1,851,990	289,690	2,006,580	531,825	4,689,626
1967	7,859	1,380,062	177,729	32,229	296,837	1,894,716
1968	4,536	1,104,904	470,450	2,278,197	1,119,114	4,977,201
1969	12,398	692,254	100,952	33,422	269,855	1,108,881
1970	8,348	731,214	275,296	813,895	775,167	2,603,920
1971	19,765	636,303	100,636	35,624	327,029	1,119,357
1972	16,086	879,824	80,933	628,580	630,148	2,235,571
1973	5,194	670,025	104,420	326,184	667,573	1,773,396
1974	6,596	497,185	200,125	483,730	396,840	1,584,476
1975	4,790	684,818	227,372	336,359	951,796	2,205,135
1976	10,867	1,664,150	208,710	1,256,744	469,807	3,610,278
1977	14,792	2,054,020	192,975	554,184	1,233,733	4,049,704
1978	17,302	2,621,667	219,360	1,689,098	567,959	5,115,386
1979	13,713	920,780	354,663	74,318	654,462	2,017,936
1980	12,497	1,584,392	283,623	1,871,058	387,078	4,138,648
Average	12,550	1,168,198	231,900	1,671,194*	616,761	2,979,594

* Even Years Only

record. Generally, based on escapements obtained since 1971, these stocks would appear to be increasing. In the Kenai River, sonar counters provide an accurate estimate of escapement. This stock appears to be in generally good condition and at least minimum escapement goals have been achieved for eight of the last twelve years. No particular problems have been detected in various spawning areas with the exception of the high water conditions blocking access to the Russian River lakes in some years. This problem has been corrected with the installation of a fish pass. Sonar counters provide accurate escapement estimates of sockeye in the Kasilof River. Escapement goals have been achieved in seven out of the last twelve years for that system.

Sockeye runs to the Susitna River drainage are second only to the Kenai River. An escapement goal of 200,000 was established in 1979 and this level has been approached in two of the three years. Sonar was first used in the Crescent River in 1979. An escapement goal of 50,000 was established and exceeded both in 1979 and 1980.

Pink salmon are the second most abundant species, with a predominantly even-year run. Until recently, the odd-year run has been one of the least abundant in terms of the commercial harvest. The Susitna is the most important spawning area for pink salmon in Cook Inlet, with the Kenai and Kasilof secondary. The timing of the pink salmon runs varies between the Susitna and Kenai/Kasilof rivers.

The even year run of pink salmon to the Susitna begins about July 10, peaks around July 20, and is over by August 1. The odd-year run to the Susitna, which has increased significantly since 1971, is about seven days earlier than the

even-year run. The even-year run to the Kenai/Kasilof rivers (there is no significant odd-year runs) begins about July 15, peaks around August 3, and is essentially over by August 18. It is, therefore, about two weeks later than the even year Susitna run. Estimates of total run size are made by sonar counts and limited escapement information which is collected incidentally to aerial surveys for other species. In general, pink salmon stocks of Upper Cook Inlet are rapidly rebuilding from the short term decline brought about by harsh environmental conditions.

Chum salmon are the third most abundant species in the commercial harvest and the second to the sockeye salmon in commercial harvest importance. The Susitna River system is the primary producer of chums, with secondary production coming from the West side and Chinitna Bay. The Susitna run begins about July 8, peaks in mid-July on even years, and the end of July on odd years, and is over by August 15.

Knowledge of chum salmon escapements is limited in the Susitna River. Although these stocks experience run fluctuations they appear to be in generally good health as evidenced by the fairly consistent harvest history. This is true for most years except 1980 which witnessed a poor chum salmon return.

Chinitna Bay escapements of chum salmon are estimated by aerial survey and the fishery is managed separately from the balance of Cook Inlet. These stocks appear to be in poor condition. Little is known about the other chum salmon stocks on the west side of the Central District. They are a minor portion of the total Cook Inlet chum salmon production.

It is difficult to interpret coho stock trends. Current commercial catches appear to be similar to the historical averages. Coho salmon spawn in many streams around the entire periphery of the gill net districts. The three

major spawning areas in order of importance are the Susitna-Little Susitna drainages, the Kenai/Kasilof rivers, and the west side of the Central District. Susitna Basin stocks return the earliest beginning about July 10 in the gillnet district, peaking about July 20, and over by early August. Kenai/Kasilof stocks run in two segments; the first one begins about July 20, peaks during the first week in August and tapers off around mid-August. The second segment begins about the third week in August, peaks during the second week in September, and tapers off in October.

In general, most Cook Inlet salmon stocks appear to be in a relatively healthy state.

SUMMARY OF COOK INLET SUBSISTENCE FISHERY

Various documents describing the changes in the Cook Inlet subsistence fishery have been made available to the Board of Fisheries. This is a brief summary of the information contained in those reports.

For the period of 1942 through 1950 no reference or mention of subsistence was made in the Cook Inlet section of the commercial fishing regulations.

The first mention of subsistence or personal use was in the 1951 regulations. It is known that subsistence fishing did exist before this time but no records were kept.

The period from 1951 to 1959 showed a reduction in the freshwater areas where subsistence fishing is allowed. At statehood, subsistence fishing

was made to conform with commercial fishing regulations. Subsistence permits were required under the general provisions section of the regulations beginning with the 1962 season.

The number of subsistence permits issued during the 1960's was relatively constant. About 340 permits were issued annually for the period 1962 through 1970.

In 1971, the northshore of the Knik Arm was to for subsistence fishing eliminating the 290 permits that were annually issued for that area. Consequently the average number of subsistence permits issued in Cook Inlet from 1971 through 1977 declined to 270. After the subsistence priority law was passed in 1978, permits have increased to a high of 1,752 issued in 1980.

Since statehood there has been a trend to decrease areas, times, gear and seasons for the subsistence fishery. In some instances, these closures were due to biological concerns for the stocks (i.e. Knik Arm to protect Big Lake sockeye). But in many cases these restrictions were due to gear conflicts, especially on the east side of the Central fishing district.

The 1980 regulations passed by the Board of Fisheries precipitated three law suits against the State. These three cases are well known and will not be discussed in this summary.

Subsistence salmon catches for the years 1969 through 1980 are shown in Table 3. It is difficult to determine harvest trends due to the many changes in seasons and shifts in targeted species.

Table 3. Cook Inlet (Upper and Lower) subsistence catch of salmon, 1969-1980.

Year	Area	King	Sockeye	Coho	Pink	Chum	Total
1969	Upper	0	1,509	1,259	30	94	2,892
	Lower	0	9	752	38	0	799
	Total	0	1,518	2,011	68	94	3,691
1970	Upper	3	1,206	2,192	295	139	3,832
	Lower	0	12	1,179	143	13	1,347
	Total	3	1,218	3,371	438	152	5,182
1971	Upper	0	7	148	0	0	155
	Lower	2	16	1,549	44	7	1,618
	Total	2	23	1,697	44	7	1,773
1972	Upper	0	4	55	27	15	101
	Lower	1	11	975	48	69	1,104
	Total	1	15	1,030	75	84	1,205
1973	Upper	0	35	332	12	37	416
	Lower	0	18	1,304	84	40	1,446
	Total	0	53	1,636	96	77	1,862
1974	Upper	1	14	291	17	2	325
	Lower	0	16	376	43	77	512
	Total	1	30	667	60	79	837
1975	Upper	1	4	659	8	92	764
	Lower	4	47	1,960	632	61	2,704
	Total	5	51	2,619	640	153	3,468
1976	Upper	0	21	567	113	13	714
	Lower	16	46	1,962	1,513	56	3,593
	Total	16	67	2,529	1,626	69	4,307
1977	Upper	2	13	327	3	14	359
	Lower	12	46	2,216	639	119	3,032
	Total	14	59	2,543	642	133	3,391
1978	Upper	5	42	3,529	128	31	3,735
	Lower	4	35	2,482	595	34	3,050
	Total	9	77	5,911	723	65	6,785
1979	Upper	158	5,564	3,570	359	272	9,923
	Lower	6	37	2,118	2,251	41	4,453
	Total	164	5,601	5,688	2.610	313	14,376
1980	Upper	2,268	5,459	3,912	4,842	492	16,973
	Lower	34	30	3,216	953	26	4,259
	Total	2,302	5,489	7,128	5,795	518	21,232

Reported From:

1. Cook Inlet Management Area Subsistence Fishery Report 1972.
2. Subsistence Fishery Permit Survey Cook Inlet-1980 prepared by Ron Stanek (Draft Report).

During the December 1980 and January 1981 meeting the Board of Fisheries set seasons, limits, locations, and allowable gear for the 1981 subsistence salmon fishery. During the March 1981 meeting the Board must determine who will qualify to participate in the Cook Inlet subsistence fishery.