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ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES

KUSKOKWIM AREA
SALMON REPORT
to the
Alaska Board of Fisheries
November, 1984

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BACKGROUND

Area and District Boundaries

The Kuskokwim Area includes the Kuskokwim River drainage and all waters of Alaska between Cape Newenham and the Naskonat Peninsula (Figure 1). Commercial salmon fishing takes place in four districts: District 1 (Lower Kuskokwim River from Eek Island to Mishevik Slough below Tuluksak); District 2 (middle Kuskokwim River from Mishevik Slough upriver to the Kolmakof River near Aniak); District 4 (approximately five miles of Kuskokwim Bay shoreline adjacent to the village of Quinhagak); District 5 (Goodnews Bay). District 3 (upper Kuskokwim River above the Kolmakof River) has been closed to commercial salmon fishing since 1966.

Management Objectives and Strategies

The Division of Commercial Fisheries of the Alaska Department of Fish and Game is responsible for the management of commercial and subsistence fisheries in the Kuskokwim area. The main objective of the Department's program is to manage both fisheries on a sustained yield basis in accordance with policies set forth by the Alaska Board of Fisheries, including assignment of subsistence as the highest priority among beneficial uses of the resource. Establishment of management plan harvest guidelines and major fishing time reductions for commercial fishing and minor fishing time reductions for subsistence fishing have been promulgated in recent years to offset the increase in fishing effort and efficiency so that adequate spawning escapements could be maintained.

Due to the impact of Japanese high seas fisheries, the need to provide for subsistence users and problems associated with obtaining timely and accurate information regarding run and escapement magnitudes, the management strategy will continue to be a conservative one.

Subsistence has been designated by the Legislature (State Law 151) as the highest priority among beneficial uses of the fish and game resources. Except in areas where intensive commercial fisheries occur, the subsistence fishery is subject to very few restrictions in order to give preference to subsistence users. In all the commercial fishing areas the majority of the fishermen usually take salmon for both commercial and subsistence purposes. Short subsistence fishing closures each week are used in Districts 1,4 and 5 to prevent the sale of subsistence caught fish and to provide for adequate spawning escapements. Substantially more subsistence fishing time is allowed by regulation compared to commercial fishing in all areas. For example, during the 1984 fishing season (June-August) in the lower Kuskokwim River, subsistence fishing was allowed for approximately 67 days out of the 92 days when harvestable numbers of salmon were present. During this same time commercial fishing was open for 6 1/4 equivalent days.

Fishery Resources

All five species of Pacific salmon are indigenous to the area: chinook or "king" salmon (Oncorhynchus tshawytscha), sockeye or "red" salmon (O. nerka), coho or "silver" salmon (O. kisutch), pink or "humpback salmon (O. gorbuscha) and chum or "dog" salmon (O. keta). In 1984 coho salmon were the most abundant species in the Kuskokwim area, followed by chum, sockeye and chinook salmon. Pink salmon are at litle economic importance and an estimate of abundance is not available.

Major Strategies and Management Considerations

Chinook Salmon

Timing of the chinook salmon run is characteristically variable in response to weather conditions. The opening of the commercial fishing season is delayed in the Kuskokwim River until Department test fishing catches and subsistence catches indicate a sustained run is occurring. The Department attempts to give three to four days advance public notice of the season opening.

The season opening is normally after June 9 unless an early run is indicated. Benifits of a June 9 or later opening include:

1. Uninterrupted subsistence fishing early during the run.
2. The commercial harvest is spread over a greater portion of the peak of the run and therefore helps minimize overharvest of discrete stocks.
3. Allows additional time to determine early run strength through analysis of test fishing and subsistence catches.

Commercial fishing time during the chinook salmon season (when unrestricted mesh gillnets can be operated) is regulated by emergency order. Fishing periods are usually six hours in duration (6 P.M.- 12 midnight) and are scheduled two times per week to spread the harvest throughout as much of the run as possible. The 6 P.M. - 12 midnight schedule is preferred by local fishermen during this time of year.

In the past if the run was average in magnitude the commercial harvest in District 1 was held at 25-35 thousand fish during the unrestricted mesh salmon season (prior to June 25) to maintain the proper allocation between subsistence, commercial, and spawning ground requirements. This resulted in a total commercial harvest ranging from 30-51,000 for the entire river (includes 3-18,000 taken during the District 1 restricted mesh salmon season and 2-4,000 in District 2). The fishery may be terminated before or after the aforementioned harvest range is attained depending on indicated in-season run strength from examination of test fishing, and subsistence and commerical catch data.

The commercial chinook salmon season in the two coastal districts, Quinhagak and Goodnews Bay, is normally opened between June 11 and June 20 depending on the entry pattern of chinook salmon into the Kanektok and Goodnews Rivers. Commercial fishing in these two districts is allowed only in marine waters. Commercial fishing is normally opened on a scheduled basis for two 12-hour periods per week from mid June through early July when is the primary target species is chinook salmon. After that time a more liberal schedule consisting usually of three 12-hour openings per week is initiated for the remainder of the season for harvesting other species of salmon. Fishermen are required to use small mesh gear (6-inch stretched mesh or smaller) during the entire salmon season. This restriction minimizes the harvesting of the larger, more fecund chinook salmon by the large mesh size, and enhances the harvests of the more abundant, smaller species (i.e. sockeye, pink, chum and coho).

Based on past catch and escapement data, the commercial harvest of chinook salmon should not greatly exceed 15,000 and 5,000 for the Quinhagak and Goodnews Bay fisheries respectively unless very large runs are occurring.

Chum Salmon

In District 1, during the restricted mesh season (June 26 to July 31), the open fishing area is restricted to that portion of the Kuskokwim River downstream from Bethel. The weekly fishing periods are scheduled by regulation, two six hour fishing periods a week from 6 P.M. to midnight on Mondays and Thursdays. There is a maximum gillnet mesh restriction of 6 inches (stretched mesh) which reduces the incidental capture of large, fecund chinook salmon.

The commercial chum salmon harvest for the Kuskokwim River should range from 200 to 400 thousand fish, although during years of exceptionally high abundance an additional 50-100 thousand fish may be taken. Commercial catches within this range should provide for traditional subsistence requirements and adequate spawning escapements. The commercial harvest should not greatly exceed 400 thousand fish except under the following conditions:

1. Test fishing catches indicate large numbers of fish still entering the river.
2. Commercial catch per unit effort (especially late in the season) is above average.
3. Observations indicate that no more than average subsistence fishing effort is occurring and that adequate subsistence catches have already been made.
4. Chum salmon escapement projects indicate adequate escapements are occuring.

The fishing fleet as a whole has become more efficient during the past few years. In order to compensate for this increased efficiency, a temporary season closure may be necessary to ensure that the harvest is taken from the entire chum salmon run and not just from portions of the run.

If it is likely that the commmercial harvest will exceed 400 thousand fish, the season may be temporarily closed. A temporary closure - one six hour fishing period - would allow time for additional compilation and examination of test fishing and subsistence catch data. The commercial chum salmon season is normally closed in mid-July, when the majority of the run has passed through the fishery.

If the Kuskokwim River chum salmon run proves to be very small, management options for insuring adequate escapements include in order of priority:

1. Commercial harvest fishing time restrictions, including early season closures.
2. Subsistence harvest fishing time restrictions.

Historically fishermen have not accurately identified sockeye and chum salmon in their commercial or subsistence catches. For this reason the true magnitude of the sockeye and chum salmon harvest in the main Kuskokwim River has not been accurately documented. In recent years fishermen, processors and the Department have worked together to properly identify each species in the commercial harvest. The 1981 season was the first year that a significant sockeye salmon harvest and run was documented. Sockeye salmon comprised 10% to 20% of the catch during the restricted mesh season since 1981. Prior to

the 1981 season, the magnitude of the reported sockeye salmon catch was less than 2% of the salmon catch during the restricted mesh season.

District 2, (middle Kuskokwim River) has a harvest guideline of 4 to 8 thousand chum salmon established by regulation in 1980. District 2 commercial openings are normally scheduled concurrently with those of District 1 to spread fishing effort throughout both districts.

Coho Salmon

The coho salmon season in the Kuskokwim River districts opens when test fishing and subsistence catches indicate that coho salmon are the predominate species available. In District 1, a fishing schedule of two 6-hour fishing periods a week (normally 9:00 A.M. to 3:00 P.M. on Mondays and Thursdays) has been in effect since 1979. The 9:00 A.M. schedule was requested by fishermen for the purpose of enhancing their safety by providing more daylight hours of fishing and so that Fish and Wildlife Protection personnel may be better able to enforce the fishing period closures.

The commercial coho salmon harvest range for the Kuskokwim River normally should be 150-250 thousand fish. Commercial catches within this range should provide adequate spawning escapements and subsistence harvests under a wide range of return magnitudes.

A harvest guideline of between 2 to 4 thousand coho salmon is established by regulation for district 2 of the main Kuskokwim River.

STATUS OF FISHERY AND STOCKS

The Kuskokwim Area commercial fishery has expanded greatly during the last few years as a result of increased numbers of participants, improvements in fishing gear, and greater tendering and processing capabilities. Effort in terms of gear operators in the area has increased from 210 In 1966 to a high of 746 in 1982. Prices offered for fish have increased since 1977 and as a result fishermen are more competitive. The present commercial fishery has become increasingly efficient over the past few years. The Division of Commercial Fisheries' records indicate commercial salmon fishermen within the Kuskokwim area were paid an approximate total of 5.8 million dollars(the highest value ever received) during the 1984 season where only .4 million dollars were earned in 1972.

The Kuskokwim area subsistence salmon fishery is the largest in Alaska and probably in the world. Kuskokwim River annual subsistence catchs of chinook and chum salmon often exceed commercial catches. Technological improvements in commercial fishing gear and equipment have benefited subsistence fishing since the same units of gear are frequently used in both fisheries. Table 1 shows annual commercial and subsistence catches made in the Kuskokwim Area since 1913.

Kuskokwim River Chinook Salmon

Since statehood chinook salmon stocks have been used more intensively by Kuskokwim River fishermen. The combined chinook salmon commercial and subsistence harvest averaged only 56 thousand fish for the 10-year period

1960-1969, but increased to 81 thousand during 1970-1979 and 103 thousand during 1980-1984. The Kuskokwim River commercial and subsistence chinook salmon harvest in 1984 totaled 108,231.

Annual commercial catches in the Kuskokwim River ranged between 30,000 and 40,000 king salmon from 1968-1972 (Table 2). The attempt has been to stabilize the fishery within this range until additional data regarding run size and escapement was obtained. Runs experienced during the years 1974-1977, 1983 and 1984, indicate that the 30,000-40,000 harvest range was too high during weaker return years. Commercial harvests since 1974 have ranged from about 19,000 to the 1982 high of 48,000. The management strategy used through the 1984 season for the entire river was to allow a harvest of 25,000-35,000 fish during the "king salmon season" when runs of average magnitude are experienced. Eight to eighteen thousand additional chinook salmon are taken during later seasons when fishing is directed to other species. The largest incidental chinook salmon catch of approximately 18,000 fish was made in 1983 during the restricted mesh season. The management strategy resulted in chinook salmon escapement that were 10 to 30% below objectives in 1983 and 51 to 84% below in 1984.

Commercial fishing effort has been at record levels in recent years and remained high during 1984 (Table 4). The efficiency and intensity of the commercial fishing fleet has increased tremendously as evidenced in the 1981 season when over 18,000 kings were taken during a single six hour fishing period.

District 2, is located directly upriver in the main Kuskokwim River from District 1, and salmon harvested there have passed through district 1. Prior to 1981 this district operated under a regulatory quota of 2,000 chinook salmon per year. In recognition of the apparent stock recovery that occurred in 1976-1980, the Board of Fisheries adopted a more flexible harvest guideline of between 2 to 4 thousand fish for this district.

Kuskokwim River Chum Salmon

Estimated peak subsistence chum salmon harvest levels were reached during the 1930's when dog teams were extensively utilized for freight hauling, but catches declined during the 1940's. Little additional data is available for the twenty year span prior to statehood.

Prior to 1971 very small commercial chum salmon harvests were allowed and represented fish taken incidentally during the chinook and coho salmon fisheries. Expansion of the commercial chum salmon fishery was allowed in 1971 when it was apparent that a moderate increase in chum salmon utilization would be biologically sound. The Kuskokwim River subsistence chum salmon harvest was estimated to average 442 thousand fish annually between 1924-1943, while the harvest averaged only about 215 thousand fish annually between 1960-1965 and decreased to about 189 thousand fish annually between 1966-1972. Based upon past subsistence harvest estimates (for example, 1924-1943 levels), a 400 thousand combined commercial and subsistence harvest appeared to be consistent with the reproductive potential of the run. The 400,000 combined catch figure was a stated management goal during the early 1970's.

Subsistence catches for the entire river have ranged widely since the inception of the commercial fishery in 1971 (116 thousand to 277 thousand

chums), however there was a general trend of increased harvests during the years 1974-77 when roe sales were permitted. The recent five year average annual harvest (1979-1983) is 173 thousand.

Commercial harvest levels since 1971 have ranged from 69,000 (1971) to 483,000 (1980) and the recent 5 year average (1979-1983) is 343,861. Prior to 1979 commercial chum salmon fishing in District 1 was only allowed in the lower 49 miles. Beginning with the 1979 season as a result of Board of Fisheries action the area open to commercial chum salmon fishing was expanded approximately 15 miles and is now from the present boundary at the north end of Eek Island upriver to markers placed immediately upstream of the city of Bethel.

Commercial fishing effort has ranged from 216 fishermen in 1971 to 635 fishermen in 1984. The efficiency of the commercial fishing fleet has increased tremendously as evidenced by a harvest of nearly 150 thousand chums during a single six hour fishing period in 1980.

Kuskokwim River Coho Salmon

Commercial catches for the entire river since statehood have ranged from a low of 5 thousand in 1971 to a high of 623 thousand in 1984 (Table 2). The recent five year annual average (1979-83) is 259 thousand fish. Effort in terms of fishing vessels has ranged from 83 in 1971 to 651 in 1984. Until recently, commercial fishing effort declined after mid-August when fishermen turned to hunting pursuits. Mainly due to price increases, a high level of fishing effort is now sustained throughout the entire season.

Traditionally, relatively few cohos were taken in the subsistence fishery due to poor drying conditions and the fact that subsistence needs have normally been met by earlier migrating species. This pattern has been changing gradually since increasing numbers of families own freezers in which they store coho salmon. Coho is the preferred species for freezing, accounting in part for the increased documented subsistence use of coho salmon during the last five years.

The timing of subsistence surveys may also account for the lower harvest figures since subsistence fishermen are often still harvesting cohos when the Department's surveys are conducted in this area.

With the exception of 1983, coho salmon returns and escapement have been average to above average in magnitude during the past seven or eight years.

Quinhagak (District 4) - All species

Salmon captured in this district are bound primarily for the Kanektok and Arolik Rivers. Commercial fishing effort has increased tremendously in recent years particularly during the chinook salmon run. Many lower Kuskokwim River fishermen now fish this district for chinook salmon as do several Goodnews Bay fishermen. An approximate average of 176 boats have fished this district annually during the last five seasons, but in 1984 260 fishermen fished in the district. Commercial and subsistence catches of all species have averaged 140 thousand and 8 thousand respectively during the recent five years. The commercial fishery has been sporadic during some years due to the unavailability of processing facilities and inclement weather. The recent improvement in the availability of processing facilities is in part

responsible for the increase in commercial catch. Chinook salmon returns have been strong in recent years particularily since 1981. Sockeye returns have been above average since 1979 with the exception of 1983.

With the exception of 1983, chum salmon returns and escapements have been above average since 1980. Coho salmon returns have been strong since 1978 but show much more variation in size than the other species.

Goodnews Bay (District 5) - All Species

The commercial salmon fishery in this district was initiated in 1968 at the request of the local residents. Commercial harvests have been relatively small compared to other Kuskokwim area fisheries. An average of about 42 fishermen have fished this district during the last five seasons but a total of 77 fished in the district in 1984. Commercial catches of all five species have averaged 81 thousand salmon during the recent five years. The subsistence harvest of all species of salmon for Goodnews Bay villages is typically less than 1500 fish. The chinook salmon returns were stable from 1973 to 1980, since 1981 they have been above average. The sockeye salmon returns are more variable but went through a series of strong returns from 1979 through 1982. Recently sockeye returns have been weaker but still above average. Chum salmon returns have been more variable but have declined slightly in recent years following a trend of increasing returns from 1978 through 1982. Coho salmon returns have been highly variable to this district.

SEASON SUMMARY

The total season commercial catches for 1984 in the Kuskokwim Area (Districts 1, 2, 4 and 5) were 74,000 chinook, 81,000 sockeye, 830,000 coho, 24,000 pink salmon, and 488,500 chum (Table 1). The total harvest of 1,497,500 salmon (all species) was 28% above the previous record harvest recorded in 1982. The coho salmon harvest was also the largest on record and was 42% greater than the previous five year average. The catches of other species were similiar to or above the previous five-year averages. All four districts had the largest coho salmon catches on record.

Kuskokwim Area fishermen received approximately $5,809,000 for their 1984 catch which was also a record. The average price per pound to the fishermen was $0.89 for chinooks, $0.52 for sockeye, $0.55 for cohos, $0.07 for pinks and $0.28 for chums.. The average Kuskokwim area fisherman earned approximately $5,773 in 1984.

Preliminary subsistence catch information indicated that the subsistence harvest in 1984 was 80,293 chinook and 187,704 "other salmon" (primarily chum and coho salmon). The reported chinook salmon harvest is the highest on record for the Kuskokwim Area.

Commercial fishing during the chinook salmon season (no mesh size restrictions) in District 1 was limited to the usual two 6 hour fishing periods on June 18 and 21 when 17,181 chinook were landed (Table 3).

An incidental catch of 11,662 chinook made during the later restricted mesh season (district 1 and the district 2 catch of 1,796 resulted in a total Kuskokwim River commercial catch of 31,742. This was the smallest catch of this species since 1976 (Table 2).

The commercial chum salmon catch of 423,718 made in the Kuskokwim River was the second highest on record only exceeded by the brood year (1980) catch of 483,751.

The commercial coho salmon catch of 623,447 for the Kuskokwim River was the largest on record, 30% higher than the previous record 1982 harvest. Due to comparative catch, escapement, and test fishing data, which indicated an above average run was in progress, district 1 and 2 were allowed a liberal fishing schedule. District 1 was allowed eight 9 hour periods rather than the usual 6 hour fishing periods and the season was extended for two periods beyond the normal September 1 closing date. District 2 was allowed to exceed the upper end of harvest guideline range by 14,000 fish. Coho salmon escapement indexes were higher than normal in all index areas.

Chinook salmon aerial, weir, and test fishing indices for the Kuskokwim River escapements in 1984 showed poor escapements. Sockeye, chum and coho salmon escapement indexes appeared at or above the escapement objectives. Low stream levels in 1984 created much better than usual conditions for viewing salmon from the air.

Several research projects are presently underway or completed to assist with assessing in-season run strength. They include a Bethel test drift project

which completed its first full season and appears to have been very successful at determining inseason run strength. The second was a contracted analysis of migratoy timing information collected from test fishing, sonar counting stations, commercial catches, and weir locations which was completed for chinook and chum salmon which helped to better identify the probable stage of the run and anticipated abundance for the remaining portion of the run.

The 1984 commercial salmon harvest set a new season record of 252,925 salmon (all species) in the Quinhagak district. The commercial catch was composed of 33,652 chinook, 17,258 sockeye, 135,342 coho, 16,249 pink and 50,424 chum salmon. The coho salmon catch was a record and all other species were above the previous 5 year average. Both the sonar and aerial escapement indies indicated that excellent escapements were achieved for all species. At the request of the local fishermen daylight fishing periods were begun three weeks earlier than normal on July 11. This change coincided with the change from two to three 12 hour periods a week in response to the strong chum and coho salmon runs.

The Goodnews Bay district also had a record season salmon harvest at 114,276 salmon composed of 8,612 chinook, 15,474 sockeye, 71,176 coho, 4711 pink and 14,340 chum salmon. The coho salmon harvest in this district was also a record with the other species catches being greater than the previous 5 year averages. Based on Goodnews River counting tower and aerial survey data the chinook salmon escapement objectives were achieved.

While sockeye salmon escapements were only slightly below stated objectives and chum salmon escapements were slightly above objectives. Comparative coho salmon escapement data is limited but on aerial survey count of 44,000 in the Goodnews River is regarded as very good.

In past years, illegal fishing activities have been common in the Kuskokwim fishery in some cases warranting temporary in-season closures in order to deal with the violations and preserve the integrity of the stocks. Such was the case during August 1981 in the Goodnews Bay fishery. During past three years, the department staff worked together with highly motivated Fish and Wildlife Protection officers in initiating the most aggressive enforcement program the Kuskokwim River has experienced in a long time. Numerous contacts were made throughout the season resulting in several cases which went to court. These cases appear to indicate that numerous violations have been occurring in the fishery for some time. Problem areas still exist primarily during the month of August when darkness hinders patrol activities.

In 1984 the Department of Fish and Game and Public Safety also received help in this area from local fishermen and fishermen groups which ranged from television spots asking fishermen to not "cheat", to testifying in court to allow successful prosecution of violators.

OUTLOOK FOR 1985

The majority of the returning king salmon in 1984 will be five and six years of age. Based on average brood year escapements, the 1984 run is expected to be average in magnitude.

Chum salmon will return as five, four and three year old fish from 1980, 1981

and 1982 brood years. The majority of the run will be composed of four year olds which are the progeny of the 1981 spawners. Escapements during 1981 were strong. Comparative catch data from the brood years also indicate an average to above average return of chums during the 1985 season.

Little information is available to assess coho abundance in 1985. The majority of cohos mature at four years of age with a few maturing at five years. Very few coho salmon escapement surveys were made in the past because of funding limitations and other factors. Commercial catches and catch per unit effort during the 1980 and 1981 brood years were average. Escapement assessment was initiated at the Holitna weir site for the first time in 1981. The department looks forward to establishing a coho escapement data base from this project, with the spawner-return ratio in 1985.

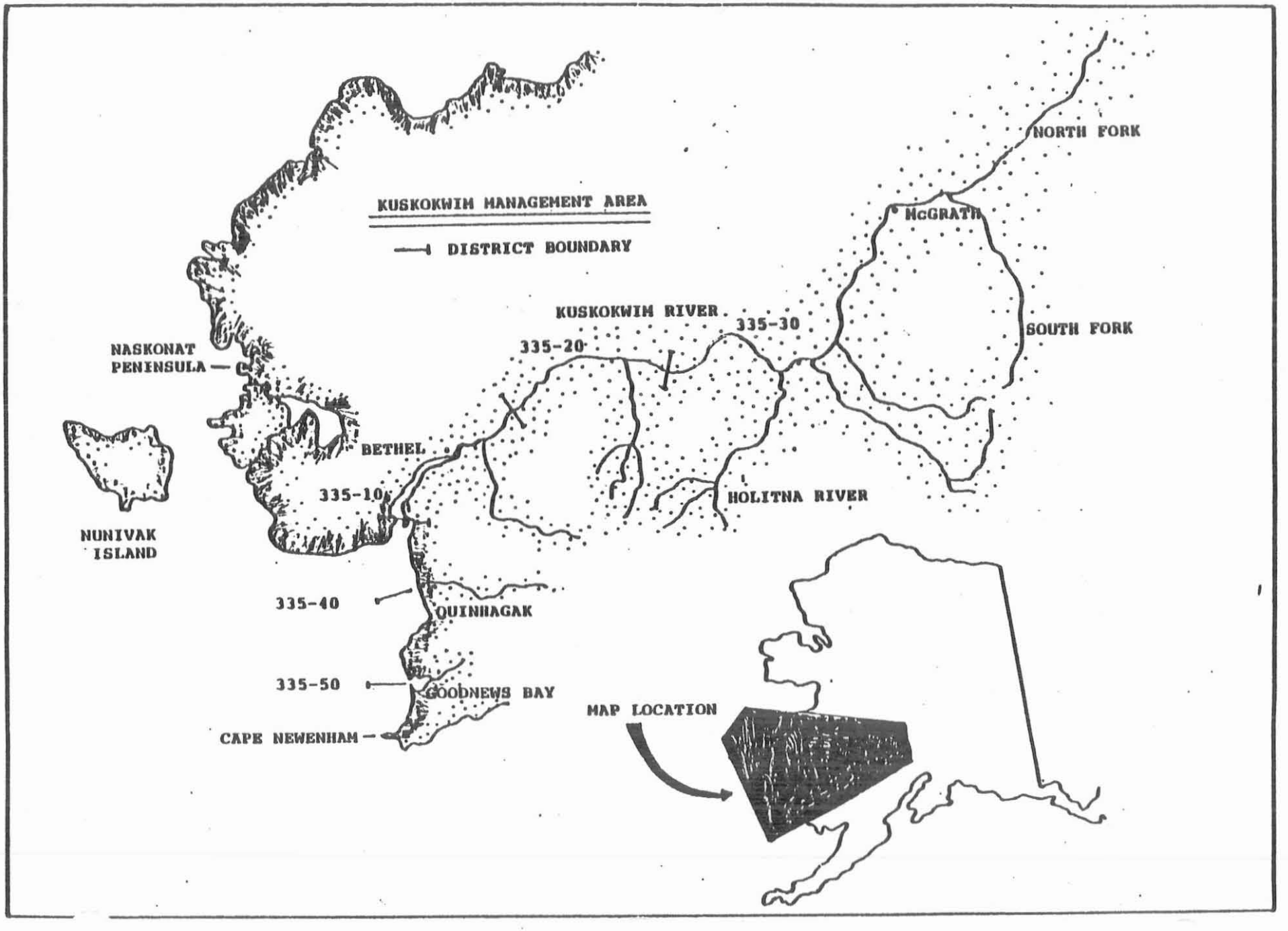
KUSKOKWIM MANAGEMENT AREA
DISTRICT BOUNDARY
NORTH FORK
McGRATH
SOUTH FORK
KUSKOKWIM RIVER
335-30
335-20
NASKONAT PENINSULA
BETHEL
335-10
HOLITNA RIVER
NUNIVAK ISLAND
335-40
QUINHAGAK
335-50
GOODNEWS BAY
CAPE NEWENHAM
MAP LOCATION

Table 1. Kuskokwim area commercial and subsistence salmon catches, 1913-1984.

	Commercial Catch						Subsistence Catch 1/		
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Other Salmon 2/	Total
1913	7,800					7,800			
1914		2,667				2,667			
1915									
1916	949					949			
1917	7,878					7,878			
1918	3,055					3,055			
1919	4,836					4,836			
1920	34,853					34,853			
1921	9,854					9,854			
1922	8,944	6,120				15,064			180,000
1923	7,254					7,254			
1924	19,253	900	7,167		7,167	34,487	14,700	203,148	217,848
1925	1,664	5,800				7,514	10,800	230,850	241,650
1926								738,576	738,576
1927								286,254	286,254
1928								481,090	481,090
1929								560,196	560,196
1930	7,626	2,448				9,963		538,650	538,650
1931	8,541					8,541		389,367	389,367
1932	9,339					9,339		746,415	746,415
1933							6,290	433,998	440,288
1934							20,800	597,132	617,932
1935	6,448		8,296			14,744	22,930	554,040	576,970
1936	624					624	33,500	549,423	582,923
1937	480					480		537,111	537,111
1938	624		828			1,452	10,153	400,242	410,395
1939	134					134	14,000	125,425	139,425
1940	247		500			747	8,000	415,523	423,523
1941	187		674			861	8,000	415,523	423,523
1942							6,400	325,339	331,739
1943							6,400	325,800	332,200

1946	2,288		674			2,962			
1947	5,356					5,356			

Table 1. Continued. Kuskokwim area commercial and subsistence salmon catches, 1913-1984.

	Commercial Catch						Subsistence Catch		
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Other Salmon	Total
1951	4,210					4,210			
1954	57					57			
1959	3,760					3,760			
1960	5,969	5,649	5,498		3	17,119	20,361	327,297	347,658
1961	23,246	2,308	5,090	91	18,864	49,599	30,910	185,447	216,357
1962	20,867	10,313	12,598	4,340	45,707	93,831	14,642	165,626	180,268
1963	18,571		15,660			34,231	37,246	141,550	178,796
1964	21,230	13,422	28,992	939	707	65,290	30,853	214,942	245,795
1965	24,965	1,886	12,191		4,242	43,284	31,143	323,002	354,145
1966	25,823	1,030	22,985	268	2,610	52,716	53,606	201,002	254,608
1967	29,986	652	58,239		8,235	97,112	61,224	252,447	313,671
1968	43,157	5,884	154,302	75,818	19,694	298,845	34,986	301,531	336,517
1969	64,777	10,362	110,473	1,251	50,377	237,240	43,732	245,299	289,031
1970	65,082	12,654	62,245	27,422	60,566	227,979	71,376	263,746	335,112
1971	44,936	6,054	10,006	13	99,423	160,432	45,465	130,329	175,974
1972	55,482	4,312	23,880	1,952	97,197	182,823	43,335	131,514	184,849
1973	51,374	5,224	152,408	634	184,207	393,847	41,697	211,468	253,165
1974	30,670	29,003	179,579	60,052	196,127	495,431	29,590	321,358	350,848
1975	27,799	17,535	109,814	899	223,532	379,579	51,045	180,429	231,474
1976	49,262	14,636	112,130	39,998	231,877	447,903	60,603	239,461	300,064
1977	58,256	18,621	263,728	434	298,959	639,998	58,163	218,824	276,987 3/
1978	63,194	13,734	247,271	61,968	282,044	668,211	38,209	137,489	175,698
1979	53,314	39,463	308,683	574	297,167	699,201	57,283	190,582	247,865
1980	48,242	42,213	327,908	30,306	561,483	1,010,152	59,900	105,000	224,900
1981	79,378	105,940	278,587	463	485,635	950,003	63,640	187,932	251,572
1982	79,816	97,716	567,451	18,259	325,471	1,088,713	61,342	240,897	302,239
1983	93,676	90,834	249,018	379	306,554	740,461	70,344 4/	203,420 4/	273,764 4/
1984	74,006	81,307	793,078	21,634	488,482	1,458,507	80,293	187,704	267,997

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1/ Subsistence catches for 1960-1976 have been revised and corrected.
2/ Primarily chum salmon and coho salmon.
3/ Final catch data used.
4/ Goodnews Bay not surveyed.

Table 2. Kuskokwim area commercial catches by drainage, 1960-1984.

Kuskokwim	Chinook	Sockeye	Coho	Pink	Chum	Total
1960	5,969	0	2,498	0		8,467
1961	18,918	0	5,044	0		23,962
1962	15,341	0	12,432	0		27,773
1963	12,016	0	15,660	0		27,676
1964	17,149	0	28,613	0		45,762
1965	21,989	0	12,191	0		34,180
1966	25,545	0	22,985	0		34,180
1967	29,986	0	56,313	0	148	86,447
1968	34,278	0	127,306	0	187	161,771
1969	43,997	322	83,765	0	7,165	135,249
1970	39,290	117	38,601	44	1,664	79,716
1971	40,274	2,606	5,253	0	68,914	117,047
1972	39,454	102	22,579	8	78,619	140,762
1973	32,838	369	130,876	33	148,746	312,862
1974	18,664	136	147,269	37	171,887	337,984
1975	21,720	23	81,945	10	181,840	285,538
1976	30,735	2,971	88,501	133	177,864	300,204
1977	35,830	9,379	241,364	203	248,721	535,451
1978	45,641	733	213,393	5,832	248,656	514,255
1979	38,966	1,054	219,060	78	261,874	521,032
1980	35,881	360	222,012	803	483,211	742,297
1981	47,663	48,375	211,251	292	418,677	726,258
1982	48,234	33,154	447,117	1,748	278,306	808,559
1983	33,174	68,855	196,287	211	276,698	575,225
1984	31,742	48,575	623,447	2,942	423,718	1,130,424
5 year average (1979-1983)	40,783	30,360	259,145	626	343,753	674,674

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Table 2. Cont. Kanetok River drainage

Quinhagak	Chinook	Sockeye	Coho	Pink	Chum	Total
1960	0	5,649	3,000	0	0	8,649
1961	4,328	2,308	46	90	18,854	25,636
1962	5,526	10,313	0	4,340	45,707	65,886
1963	6,555	0	0	0	0	6,555
1964	4,081	13,422	379	939	707	19,528
1965	2,976	1,886	0	0	4,242	9,104
1966	278	1,030	0	268	2,610	4,186
1967	0	652	1,926	0	8,087	10,665
1968	8,879	5,884	21,511	75,818	19,497	131,589
1969	16,802	3,784	15,077	953	38,206	74,822
1970	18,269	5,393	16,850	15,195	46,556	102,623
1971	4,185	3,118	2,982	13	30,208	40,506
1972	15,880	3,286	376	1,878	17,247	38,667
1973	14,993	2,783	16,515	277	19,680	54,248
1974	8,704	19,510	10,979	43,642	15,928	98,133
1975	3,928	8,584	10,742	486	35,233	58,973
1976	14,110	6,090	13,777	31,412	43,659	109,048
1977	19,090	5,519	9,028	202	43,707	77,546
1978	12,335	7,589	20,114	47,033	24,798	111,869
1979	11,144	18,828	47,525	295	25,995	103,787
1980	10,387	13,221	62,610	21,671	65,984	173,873
1981	24,525	17,292	47,587	160	53,316	142,880
1982	22,106	25,685	73,651	11,838	33,336	166,616
1983	46,385	10,263	32,442	168	23,090	112,348
1984	33,652	17,258	135,342	16,249	50,424	252,925
5 Year Average (1979–1982)	22,909	17,058	52,763	6,826	40,344	139,900

Table 2. Continued. Goodnews Bay drainage.

Goodnews Bay 1/ Goodnews River	Chinook	Sockeye	Coho	Pink	Chum	Total
1968			5,485			5,485
1969	3,987	6,256	11,631	298	5,006	27,169
1970	7,163	7,144	6,974	12,183	12,346	45,630
1971	477	330	1,771	0	301	2,879
1972	264	924	925	66	1,331	3,510
1973	3,543	2,072	5,017	324	15,781	26,737
1974	3,302	9,357	21,340	16,373	8,942	59,314
1975	2,151	8,928	17,127	403	6,459	35,068
1976	4,417	5,575	9,852	8,453	10,354	38,651
1977	3,336	3,723	13,335	29	6,531	26,954
1978	5,218	5,412	13,764	9,103	8,590	42,087
1979	3,204	19,581	42,098	201	9,298	74,382
1980	1,974	28,632	43,256	7,832	11,748	93,442
1981	7,190	40,273	19,749	11	13,642	80,865
1982	9,476	38,877	46,683	4,673	13,829	113,538
1983	14,117	11,716	19,660	0	6,766	52,259
1984	8,612	15,474	71,176	4,711	14,340	114,313
5 Year Average (1979-1982)	7,264	27,816	34,289	2,443	11,057	82,869

1/ District 335-50 and includes Chagvan Bay.

Table 3.

FINAL SEASON SUMMARY FOR DISTRICT W1-LOWER KUSKOKWIM

	Period Dates	Hours Fished	No. of Fishermen	Period Catch and Catch Per Unit Effort									
				CHINOOK	CPUE	SOCKEYE	CPUE	COHO	CPUE	PINK	CPUE	CHUM	CPUE
1	6/18-6/18	6	484	10,845	3.73	409	0.14	0	0.00	0	0.00	5,803	2.00
2	6/21-6/21	6	443	6,336	2.38	2,618	0.98	0	0.00	4	0.00	22,094	8.31
LARGE MESH/CHINOOK SEASON				17,181		3,027		0		4		27,897	
3	6/25-6/25	6	466	3,018	1.08	10,743	3.84	0	0.00	12	0.00	91,773	32.82
4	6/28-6/28	6	470	2,625	0.93	10,942	3.88	0	0.00	55	0.02	67,120	23.80
5	7/02-7/02	6	483	1,988	0.69	8,145	2.81	0	0.00	249	0.09	69,897	24.12
6	7/05-7/05	6	426	1,218	0.48	6,798	2.66	1	0.00	188	0.07	54,981	21.51
7	7/09-7/09	6	496	1,211	0.41	2,821	0.95	52	0.02	264	0.09	36,440	12.24
8	7/12-7/12	6	436	858	0.33	2,188	0.84	196	0.07	363	0.14	24,269	9.28
9	7/16-7/16	6	373	744	0.33	1,121	0.50	619	0.28	599	0.27	18,613	8.32
SMALL MESH/CHUM SEASON				11,662		42,758		868		1,730		363,093	
10	7/30-7/30	6	459	351	0.13	281	0.10	56,609	20.56	333	0.12	2,329	0.85
11	8/02-8/02	6	401	291	0.12	157	0.07	79,240	32.93	201	0.08	1,184	0.49
12	8/06-8/06	9	542	106	0.02	113	0.02	84,406	17.30	263	0.05	639	0.13
13	8/09-8/09	9	523	106	0.02	111	0.02	80,990	17.21	177	0.04	373	0.08
14	8/13-8/13	9	504	81	0.02	67	0.01	80,268	17.70	60	0.01	235	0.05
15	8/16-8/16	9	502	50	0.01	29	0.01	78,342	17.34	62	0.01	131	0.03
16	8/20-8/20	9	491	33	0.01	14	0.00	63,829	14.44	31	0.01	59	0.01
17	8/23-8/23	9	481	21	0.00	11	0.00	49,372	11.40	26	0.01	63	0.01
18	8/27-8/27	9	350	53	0.02	2	0.00	16,472	5.23	33	0.01	18	0.01
19	8/30-8/30	9	210	9	0.00	1	0.00	11,222	5.94	11	0.01	5	0.00
20	9/03-9/03	6	60	2	0.01	0	0.00	1,603	4.45	0	0.00	5	0.01
21	9/06-9/06	6	39	0	0.00	0	0.00	1,877	8.02	0	0.00	0	0.00
COHO SEASON				1,103		786		604,230		1,197		5,041	
Season Total				29,946		46,571		605,098		2,931		396,031	

Table 3. (continued)
DISTRICT 2 SEASON SUMMARY

	Period Dates	Hours Fished	No. of Fishermen	Period Catch and Catch Per Unit Effort									
				CHINOOK	CPUE	SOCKEYE	CPUE	COHO	CPUE	PINK	CPUE	CHUM	CPUE
1	6/21-6/21	6	15	561	6.23	84	0.93	0	0.00	0	0.00	967	10.74
LARGE MESH/CHINOOK SEASON				561		84		0		0		967	
2	6/25-6/25	6	25	493	3.29	543	3.62	0	0.00	0	0.00	5,705	38.03
3	6/28-6/28	6	33	525	2.65	395	1.99	0	0.00	0	0.00	13,376	67.56
4	7/02-7/02	6	25	204	1.36	982	6.55	0	0.00	11	0.07	7,420	49.47
SMALL MESH/CHUM SEASON				1,222		1,920		0		11		26,501	
5	8/06-8/06	6	16	9	0.09	0	0.00	4,339	45.20	0	0.00	110	1.15
6	8/09-8/09	6	11	1	0.02	0	0.00	4,340	65.76	0	0.00	69	1.05
7	8/13-8/13	6	12	1	0.01	0	0.00	2,792	38.78	0	0.00	24	0.33
8	8/16-8/16	6	17	1	0.01	0	0.00	3,652	35.80	0	0.00	16	0.16
9	8/20-8/20	6	13	1	0.01	0	0.00	2,179	27.94	0	0.00	0	0.00
10	8/23-8/23	6	8	0	0.00	0	0.00	1,047	21.81	0	0.00	0	0.00
11	-	0	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
12	-	0	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
COHO SEASON				13		0		18,349		0		219	
Season Total				1,796		2,004		18,349		11		27,687	

Table 3. (Continued)
QUINHAGAK FINAL SEASONAL SUMMARY

09/27/84

	Period Dates	Hours Fished	No. of Fishermen	Period Catch and Catch Per Unit Effort									
				CHINOOK	CPUE	SOCKEYE	CPUE	COHO	CPUE	PINK	CPUE	CHUM	CPUE
1	6/18-6/19	12	140	11,997	7.14	435	0.26	0	0.00	7	0.00	1,809	1.08
2	6/21-6/22	12	164	5,458	2.77	1,336	0.68	0	0.00	13	0.01	4,471	2.27
3	6/25-6/26	12	99	4,112	3.46	1,640	1.38	0	0.00	18	0.02	5,417	4.56
4	6/28-6/29	12	101	3,283	2.71	1,967	1.62	0	0.00	53	0.04	4,702	3.88
5	7/02-7/03	12	70	1,902	2.26	1,577	1.88	1	0.00	50	0.06	6,034	7.18
6	7/05-7/06	12	62	850	1.14	1,157	1.56	0	0.00	139	0.19	2,768	3.72
7	7/09-7/10	12	84	1,259	1.25	2,497	2.48	4	0.00	297	0.29	5,610	5.57
8	7/11-7/11	12	98	1,176	1.00	2,011	1.71	9	0.01	431	0.37	4,567	3.88
9	7/13-7/13	12	105	1,011	0.80	1,842	1.46	7	0.01	994	0.79	4,270	3.39
10	7/16-7/16	12	46	441	0.80	564	1.02	39	0.07	563	1.02	1,784	3.23
11	7/18-7/18	12	73	445	0.51	657	0.75	234	0.27	1,217	1.39	2,410	2.75
12	7/20-7/20	12	75	412	0.46	477	0.53	787	0.87	2,021	2.25	2,256	2.51
13	7/23-7/23	12	95	324	0.28	361	0.32	1,386	1.22	2,902	2.55	1,316	1.15
14	7/25-7/25	12	98	379	0.32	317	0.27	3,483	2.96	2,871	2.44	1,397	1.19
15	7/27-7/27	12	118	194	0.14	202	0.14	5,512	3.89	2,412	1.70	677	0.48
16	7/30-7/30	12	35	73	0.17	19	0.05	3,079	7.33	598	1.42	173	0.41
17	8/01-8/01	12	81	67	0.07	53	0.05	5,680	5.84	1,144	1.18	272	0.28
18	8/03-8/03	12	66	40	0.05	30	0.04	5,390	6.81	130	0.16	151	0.19
19	8/06-8/06	12	61	38	0.05	16	0.02	8,436	11.52	194	0.27	95	0.13
20	8/08-8/08	12	127	71	0.05	30	0.02	19,215	12.61	142	0.09	132	0.09
21	8/10-8/10	12	75	28	0.03	15	0.02	9,428	10.48	30	0.03	16	0.02
22	8/13-8/13	12	78	36	0.04	28	0.03	10,961	11.71	0	0.00	53	0.06
23	8/15-8/15	12	165	28	0.01	12	0.01	14,216	7.18	13	0.01	28	0.01
24	8/17-8/17	12	63	2	0.00	1	0.00	9,785	12.94	0	0.00	2	0.00
25	8/20-8/20	12	67	10	0.01	3	0.00	8,728	10.86	0	0.00	11	0.01
26	8/22-8/22	12	44	6	0.01	1	0.00	5,165	9.78	0	0.00	1	0.00
27	8/24-8/24	12	65	3	0.00	5	0.01	6,926	8.88	10	0.01	2	0.00
28	8/27-8/27	12	68	3	0.00	2	0.00	3,736	4.58	0	0.00	0	0.00
29	8/29-8/29	12	57	1	0.00	1	0.00	3,623	5.30	0	0.00	0	0.00
30	8/31-8/31	12	48	0	0.00	1	0.00	2,996	5.20	0	0.00	0	0.00
31	9/03-9/03	12	50	2	0.00	1	0.00	2,717	4.53	0	0.00	0	0.00
32	9/05-9/05	12	46	1	0.00	0	0.00	3,799	6.88	0	0.00	0	0.00
33	9/07-9/07	12	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Season Total				33,652		17,258		135,342		16,249		50,424	

Table 3. (continued)
SEASONAL SUMMARY FOR DISTRICT 5 - GOODNEWS BAY

	Period Dates	Hours Fished	No. of Fishermen	Period Catch and Catch Per Unit Effort									
				CHINOOK	CPUE	SOCKEYE	CPUE	COHO	CPUE	PINK	CPUE	CHUM	CPUE
1	6/18-6/19	12	29	1,706	4.90	348	1.00	0	0.00	0	0.00	501	1.44
2	6/21-6/22	12	35	1,298	3.09	967	2.30	0	0.00	0	0.00	591	1.41
3	6/25-6/26	12	38	1,896	4.16	2,087	4.58	0	0.00	5	0.01	2,351	5.16
4	6/28-6/29	12	37	807	1.82	2,097	4.72	0	0.00	12	0.03	1,981	4.46
5	7/02-7/03	12	41	578	1.17	2,108	4.28	0	0.00	75	0.15	1,889	3.84
6	7/05-7/06	12	36	351	0.81	2,056	4.76	0	0.00	135	0.31	1,720	3.98
7	7/09-7/10	12	41	347	0.71	2,167	4.40	0	0.00	479	0.97	1,371	2.79
8	7/12-7/13	12	40	327	0.68	1,444	3.01	0	0.00	465	0.97	1,057	2.20
9	7/16-7/16	12	40	294	0.61	902	1.88	18	0.04	627	1.31	1,215	2.53
10	7/20-7/20	12	47	192	0.34	395	0.70	111	0.20	590	1.05	657	1.16
11	7/23-7/23	12	36	97	0.22	318	0.74	195	0.45	365	0.84	253	0.59
12	7/25-7/25	12	30	82	0.23	135	0.38	383	1.06	230	0.64	205	0.57
13	7/27-7/27	12	38	104	0.23	166	0.36	1,059	2.32	391	0.86	166	0.36
14	7/30-7/30	12	35	73	0.17	84	0.20	1,306	3.11	243	0.58	120	0.29
15	8/01-8/01	12	32	70	0.18	45	0.12	2,811	7.32	370	0.96	61	0.16
16	8/03-8/03	12	35	76	0.18	36	0.09	3,943	9.39	261	0.62	61	0.15
17	8/06-8/06	12	39	79	0.17	34	0.07	4,275	9.13	138	0.29	41	0.09
18	8/08-8/08	12	43	60	0.12	37	0.07	2,712	5.26	103	0.20	26	0.05
19	8/10-8/10	12	40	36	0.08	18	0.04	4,198	8.75	58	0.12	17	0.04
20	8/13-8/13	12	37	36	0.08	9	0.02	4,852	10.93	28	0.06	18	0.04
21	8/15-8/15	12	40	26	0.05	5	0.01	5,999	12.50	25	0.05	10	0.02
22	8/17-8/17	12	37	22	0.05	4	0.01	6,880	15.50	23	0.05	6	0.01
23	8/20-8/20	12	40	12	0.03	3	0.01	9,590	19.98	19	0.04	3	0.01
24	8/22-8/22	12	34	9	0.02	7	0.02	6,731	16.50	17	0.04	6	0.01
25	8/24-8/24	12	41	9	0.02	1	0.00	4,356	8.85	7	0.01	1	0.00
26	8/27-8/27	12	37	13	0.03	0	0.00	2,115	4.76	28	0.06	4	0.01
27	8/29-8/29	12	44	4	0.01	1	0.00	3,402	6.44	3	0.01	4	0.01
28	8/31-8/31	12	45	1	0.00	0	0.00	2,606	4.83	5	0.01	0	0.00
29	9/03-9/03	12	38	2	0.00	0	0.00	1,432	3.14	7	0.02	2	0.00
30	9/05-9/05	12	31	5	0.01	0	0.00	2,202	5.92	2	0.01	3	0.01
31	9/07-9/07	12	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Season Total				8,612		15,474		71,176		4,711		14,340	

Table 4. Kuskokwim area, commercial effort by district, 1970-1984. 1/

Year	Chinook Season	Chum Season	Coho Season	Total
District 1				
1970	361	2/	266	387
1971	418	216	83	422
1972	405	176	245	425
1973	456	341	411	530
1974	606	467	516	666
1975	472	540	533	737
1976	561	517	516	674
1977	563	522	572	653
1978	615	617	597	723
1979	591	617	613	685
1980	553	579	586	663
1981	589	613	586	679
1982	610	576	596	686
1983	544	619	577	679
1984	520	586	619	654
Previous 5 Year Average	577	601	592	678
District 2				
1970	10	2/	11	18
1971	22	2/	2/	22
1972	12	2/	2/	12
1973	28	2/	2/	28
1974	36	2/	16	37
1975	38	2/	2/	38
1976	55	2/	11	57
1977	83	54	24	105
1978	28	2/	16	43
1979	41	2/	20	43
1980	37	21	12	43
1981	153	11	16	153
1982	38	50	25	60
1983	14	42	9	43
1984	15	49	32	49
Previous 5 Year Average	57	31	16	68

Table 4. Continued. Kuskokwim area, commercial effort by district, 1970-1984 1/

District 4		District 5	
Year	Total	Year	Total
1970	88	1970	35
1971	61	1971	16
1972	107	1972	14
1973	109	1973	21
1974	196	1974	49
1975	197	1975	50
1976	181	1976	40
1977	258	1977	34
1978	200	1978	35
1979	206	1979	30
1980	169	1980	48
1981	186	1981	48
1982	177	1982	48
1983	226	1983	79
1984	260	1984	77
Previous 5 Year Average	201		66

1/ Number of actual fishing vessels.
2/ No commercial fishing allowed.
3/ (Five Year Average = 1978-1982).