

Report to the Alaska Board of Fisheries

KUSKOKWIM AREA SALMON, 1988

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INTRODUCTION

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, the Lower Kuskokwim River consisting of the portion of the Kuskokwim River upstream of Popokamiut to the regulatory markers located just upstream of the mouth of Bogus Creek (Figure 2). District 2, the Middle Kuskokwim River consisting of the Kuskokwim River upstream from regulatory markers at the High Bluffs to the regulatory markers at Chuathbaluk (Figure 3). District 4, Quinhagak consisting of Kuskokwim Bay between the mouth of Oyak Creek and the South mouth of the Arolik River (Figure 4). District 5, Goodnews Bay consisting of the waters of Goodnews Bay (Figure 5).

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 by the policies set forth by the Alaska Board of Fisheries.

The area's commercial fishery has expanded during the last ten years as a result of increased participation by individual fishermen and improvements in fishing gear, tendering, and processing capabilities. In 1988, a record 811 of the 832 permit holders made at least one landing (Table 1). Kuskokwim Area permit holders transfer freely between districts. Total effort counts began in 1984 by making cross-district comparisons of landings by permit to prevent double counting.

There were 838 permanent and interim salmon permits issued in the Kuskokwim Area in 1976 by the Limited Entry Commission. Later adjudication has resulted in a total of 829 permanent and 3 interim permits being available in 1988. Commercial harvest guidelines and gear restrictions have offset increases in fishing effort and efficiency so that adequate subsistence harvests and average spawning escapements could be maintained.

The area's major spawning systems received provisional spawning escapement objectives in 1983 (Table 2). Objectives were the average escapement counts obtained in these systems since 1959. The objectives represent the escapement levels needed to maintain the salmon stocks at past levels of abundance. Continuing assessment of the escapement data has required adjustment of the objectives to present the most accurate index of escapement available.

The Kuskokwim River subsistence salmon fishery is one of the largest and most important in the state, with over 1,300 families participating. Subsistence catches of chinook salmon in the Kuskokwim River often exceed the commercial catch of this species. Technological improvements in commercial fishing gear have increased efficiency of the subsistence fishery since the same units of gear often fish in both fisheries.

fishermen take salmon for BOTH commercial and subsistence uses. Subsistence fishing restrictions, in the form of short closures before, during, and following the commercial periods in all districts discourages illegal commercial fishing under the guise of subsistence fishing. These closures help to provide for adequate spawning escapements. In Districts 2, 4 and 5, the spawning tributaries are also closed. In District 1 subsistence fishing closes only in the commercial fishing district within the main stem of the Kuskokwim River and between Districts 1 and 2.

The inclusion of the Kuskokwim River upstream of commercial fishing District 1 in the subsistence closure was new in 1988. This appeared to be a very successful regulation change. In the past, during overflights of subsistence fishing periods, only 1 to 3 boats were observed in this area. Preceding and during commercial openings, when this area remained open to subsistence fishing the effort would increase to as many as 20 boats. Closing this area appeared to solve the problem. One fisherman was ticketed for fishing during the closure. The Working Group and Department did receive a complaint, following the second opening in District 1, from Kwethluk asking that subsistence fishing be opened if commercial fishing remained closed.

Substantially more subsistence fishing time occurs compared with commercial fishing in all areas. For example, during the 1988 fishing season in District 1 (June - September), fishermen could subsistence fish for approximately 80 days out of the 107 days when harvestable numbers of salmon were present. There were 23 fishing periods totaling 140 hours of fishing time for commercial fishermen.

The Division of Commercial Fisheries began annual subsistence salmon harvest surveys in 1960, 1967, and 1979 in the Kuskokwim River, Quinhagak, and Goodnews Bay districts, respectively. In 1988 the Division of Subsistence took over the annual subsistence salmon harvest surveys under a memorandum of agreement with the Commercial Fisheries Division. As in the past the project goals were:

1. To obtain estimates of community harvest of subsistence caught salmon by species for 32 Kuskokwim Area communities.
2. To achieve a total (expanded) harvest estimate for subsistence-caught salmon by species for the Kuskokwim River drainage.
3. To identify issues affecting subsistence.
4. To update community household lists and identify fishing households in Kuskokwim Area communities.

In May and June subsistence "catch calendars" were mailed to Kuskokwim Area households by the Commercial Fisheries Division.

During the period 12 August to 31 October, project staff visited Kuskokwim River drainage communities to update household lists, identify fishing households, collect catch calendars, and administer a brief survey to all fishing households. Additional catch calendars were received through the mail.

the Kuskokwim River for the first time since 1981. The prohibition of sale of incidentally caught chinook salmon however resulted in a large number of unsalable fish. Dissatisfaction with the 1987 plan resulted in a new management plan for 1988 and the creation the Kuskokwim River Salmon Working Group. Using the new strategy allowed chinook salmon to reach escapement objectives again in 1988.

Maximum gill net specifications are for 6-inch or smaller mesh, 50 fathoms in length and 45 meshes depth in all districts. Fishing periods in District 1 and 2 are usually six hours in duration. From 1:00 p.m. until 7:00 p.m. as required by the management plan, longer fishing periods have the extra time equally divided before 1:00 p.m. and after 7:00 p.m. The Management Plan also authorized three 8 hour periods in June. Following the first 8 hour period many fishermen appeared at the Working Group meeting to express their unhappiness with 8 hour periods. As a result the Working Group recommended that the fishing periods all be from 1:00 p.m. until 7:00 p.m. for the remainder of the season in the Kuskokwim River Districts.

The commercial chinook salmon season in the District 4, Quinhagak opens before 16 June as prescribed under 5 AAC 07.367. DISTRICT 4 SALMON MANAGEMENT PLAN which was adopted by the Board in 1987. Based on catch reports by subsistence and sport fishermen fishing in the Kanektok River and past years' run timing District 4 opened on, 13 June in 1988. The commercial chinook salmon harvest level in District 4 is about 15,000 unless the Department escapement projects determine adequate escapement.

District 5, Goodnews Bay normally opens between 11 and 20 June depending on the entry pattern of sockeye salmon into the Goodnews River. The sockeye salmon and chinook salmon stock migrate through the district together in June. The increased fleet efficiency and small size of the chinook salmon stock has resulted in a special emphasis on protection of chinook salmon from over harvest during the June sockeye salmon fishery. Two 12-hour periods per week from mid-June to early July is the normal fishing schedule when the target species are chinook and sockeye salmon. The commercial chinook salmon harvest level is about 5,000 fish unless the Department escapement projects determine adequate escapement.

Sockeye Salmon

Sockeye salmon are harvested incidentally to chinook and chum salmon in Districts 1 and 2. Historically, fishermen have not accurately identified sockeye and chum salmon in their commercial or subsistence catches in the Kuskokwim River. For this reason, the true accounting of the sockeye and chum salmon harvest in the main Kuskokwim River is not known. Fishermen, processors, and the Department have worked since 1981, to accurately identify each species in the commercial harvest. Sockeye salmon have comprised 6 to 24 percent of the chum-sockeye salmon catch since 1981. Before 1981, the reported sockeye salmon catch was less than 2 percent of the chum-sockeye salmon catch (Table 3). The limited sockeye salmon database and interviews with lifelong residents of the drainage suggest that the recent increase in catch is partly a result of an improvement in the size of the sockeye salmon returns.

run in 1984 and a late run in 1988 resulted in extending the season into September.

Commercial coho salmon harvests in District 4 have ranged from 11,000 to 135,000 fish (Table 3). The commercial harvest of coho salmon in District 5 has ranged from 10,000 to 71,000 fish. Intermittent aerial escapement surveys along with commercial catch data provide the only in-season hint of run strength. A three (Monday, Wednesday, Friday) 12-hour (0600 to 1800 hours) fishing periods per week schedule has allowed commercial catches that provide adequate spawning escapements and subsistence harvests. Inclement weather often disrupts the fishing effort in District 4 and District 5 during the coho salmon return. The three period per week schedule is normally frequent enough to compensate for any "lost" (due to weather) fishing time. District 4 and District 5 close by regulation on 8 September.

STATUS OF FISHERY AND STOCKS

During the period 1983-1987 the average annual catch value to the salmon fishermen was \$4.6 million (Table 1). In 1988 the value of the catch was \$12.5 million. Increased prices and catches were responsible for the increased value of the catch. The 1988 value is a minimum figure. It is based on the value paid to fishermen reported on the Department's copy of the fish tickets. During the 1988 season there were a large number of incentive programs available to fishermen in the Kuskokwim Area. These ranged from free round-trip airline tickets to Anchorage to loyalty bonuses. Each individual fishermen had a different actual value received for his catch, depending on which of the programs s\he participated in. The actual value received for the catch is unknown but probably was 20 to 30 percent greater than reported. Table 3 summarizes the commercial and subsistence catches in the Kuskokwim Area since 1913.

Kuskokwim River Chinook Salmon

The combined commercial and subsistence chinook salmon harvest has increased from an average of 56,000 fish for the 10 year period 1960-1969 to 85,600 during 1983-1987 (Figure 6). A commercial harvest target of 30,000 to 40,000 was in effect from 1973-1984 to stabilize catches until the result of such a harvest could be evaluated. Experience showed that the 30,000 to 40,000 harvest range was too high during weaker runs. In 1984 the Board of Fisheries reduced the range to 17-32,000 chinook salmon. The 1985 chinook salmon catch of 37,889 exceeded the harvest guideline and escapements were 25 to 43 percent of the desired objectives. The catch remained in the harvest guideline in 1986 and chinook salmon escapements were still 28 to 32 percent of the objectives. Conservative actions by the Board in 1986 resulted in escapement objectives being achieved in 1987 and 1988 for the first time since 1981. This occurred in spite large harvests, suggesting that an increase in run size was primarily responsible (Figure 6).

The six-inch mesh restriction appeared to result in an improvement in quality of the escapement with an increase in the proportion of females at the Kogrukluk weir. However, the female sex ratio since 1985 is within the range of recorded sex ratios before the gear change in 1985 (22 to 49 percent female). The

Traditionally, few coho salmon were taken in the subsistence fishery due to poor drying conditions and subsistence needs were met by earlier migrating species. This pattern has been changing gradually since increasing numbers of families own freezers. Coho salmon is the preferred species for freezing, accounting in part for the increased documented subsistence use of coho salmon during the last five years. The Department has emphasized collection of subsistence coho salmon catch data in recent years. Subsistence Division's survey this year attempts to place a greater emphasis on the collection of coho salmon catch data. Preliminary results from individual villages suggest that the coho salmon harvest is much greater than previously documented.

Quinhagak District 4. All Salmon Species

The Quinhagak District is in Kuskokwim Bay about 25 miles' south of District 1 (Figure 1). Commercial fishing occurs only in the marine waters of Kuskokwim Bay (Figure 4). This restriction is necessary to ensure escapement of adequate numbers of salmon up the narrow Kanektok River. The fishery primarily consists of fishing drift gill nets in tidal channels radiating out into Kuskokwim Bay from the mouths of the streams in the district.

It appears that chinook salmon abundance has been decreasing since the peak commercial harvest of 46,385 chinook salmon in 1983. By reducing the commercial fishing time chinook salmon escapement objectives have been achieved. Sockeye and chum salmon escapements were below escapement objectives in 1985 and 1986. In 1987 sockeye salmon exceeded escapement objectives while the chum salmon only reached 17 percent of the objective.

The stock status of coho salmon is difficult to determine as aerial surveys are the only form of escapement monitoring present in the district. Aerial surveys are often impossible due to weather conditions in late August and September. The commercial coho salmon catch data seem to suggest a trend of increasing abundance or there is an increased efficiency and effort by the commercial fishermen.

Goodnews Bay, District 5. All Salmon Species

Commercial salmon fishing began in 1968 in Goodnews Bay and has occurred annually since that time. The prevailing commercial gear employed consists of drift gill nets that are fished in tidal channels radiating from the Goodnews River. Migration timing of chinook, sockeye and chum salmon overlap in Goodnews Bay.

A counting tower on the middle fork of the Goodnews River estimates salmon escapement. Use of the tower began in 1981. Chinook, sockeye and chum salmon are in migration during the time the tower is in operation. The project termination date precludes adequate assessment of the escapement of coho and pink salmon. The primary objective of the project is to provide daily escapement information to assist management of the commercial salmon fishery in Goodnews Bay. The tower also allows the accurate interpolation of the aerial survey escapement data collected in the Goodnews River drainage. This interpolation provides an estimate of total escapement. Total run size can then

District 1 downstream of Bethel in compliance with 5 AAC 07.365. KUSKOKWIM RIVER SALMON MANAGEMENT PLAN.

On 17 June, following the first period, the Working Group had a difficult decision. The commercial catch and test fisheries confirmed that an exceptional chum salmon run was occurring but that the chinook salmon run was only average. Another opening in the entire district to harvest the chum salmon could over harvest the chinook salmon. After much discussion of the past and present data the group recommended that another fishing period be held in District 1 downstream of Bethel on 20 June. The group felt that this would allow increased escapement of the earlier running chinook salmon while allowing the harvest of the abundant chum salmon. The harvest guideline for chinook salmon was being approached and run strength was unclear following the second opening. The chum salmon run was large and further harvest was appropriate. The entire length of District 1 opened for the first time on 24 June. District 2 opened for the first time coincidentally with District 1 on 24 June (Table 11). Chinook salmon catches began a rapid decline with the third period making it clear that any efforts to conserve chinook salmon would be futile. The management emphasis concentrated on harvesting chum salmon without over taxing processor capacity.

District 2 closed on 2 July. This was done because the chum salmon catch exceeded the harvest guideline, fish quality was becoming very poor, and subsistence fishermen in District 2 desired undisturbed fishing.

District 2 reopened on 8 August when the new in-season subsistence catch program showed that most of the fish available were coho salmon (Table 11). By 9 August it was clear that a strong coho salmon run was occurring and fishing periods became more frequent. The Working Group found clear evidence in the subsistence, commercial, and test fishing catches that the fishing schedule was to intense on 19 August. The meeting on 19 August adjourned without setting any openings (an opening for 20 August was already set). At the next meeting the Working Group recommended that the fishery remain closed for the rest of the week to allow improvement of coho salmon escapement.

Two final fishing periods occurred in District 1 on 27 and 31 August. These two openings confirmed the data from the two test fisheries that showed the coho salmon run was declining. These periods also allowed a harvest of the later coho salmon stocks which may not yet have been harvested. The coho salmon catch of 524,296 fish is the third largest on record for the Kuskokwim River (Table 3).

Chum salmon in the Kuskokwim River provided a record catch of 1.38 million, while achieving the escapement objectives for this species. The Kuskokwim River Salmon Working Group used the new industry test fishery near Eek and the new in-season subsistence effort program, in combination with the Department's established programs, to determine early on that the chum salmon run was larger than normal. By fishing steadily through out the run the Working Group allowed a record harvest. The same strategy did not over harvest any individual spawning stocks of fish. As a result, fishing continued through out the month of July in District 1 for the first time in the history of the fishery (Table 10).

District 4 had the largest coho salmon catch of the season on the preceding period (15 August). As a result of the strong catch and the District 1 closure, a significant effort shift occurred on the 17 August period.

Chinook salmon catches were very weak and became smaller with each fishing period through 20 June (Table 13). Normally catches would be increasing. Fishing closed from 21 June to 28 June due to the unexpected weakness of the run. On 24 June large numbers of chinook salmon were reported entering the Kanektok River by subsistence and sport fishermen, and the Department catch monitor in Quinhagak. A fishing period on 28 June which was opened to check the status of the run had good catches. The twice a week fishing schedule resumed based on the improvement in the run. Sockeye salmon dominated the catch beginning 2 July and management for sockeye salmon began (Table 13).

The total chinook catch in District 4 was 13,873 in 1988 well below the previous 5 year average of 31,900 (Table 3). Chinook salmon were the second most valuable fish in the district producing \$289,100 for the fishermen (Table 9). The aerial survey index of 11,100 chinook salmon exceeded the escapement objective of 5,800.

The chinook salmon run was weaker than expected in 1988. Fishing time and effort was similar to previous years with comparable escapement indexes. However, most of those years' catches were well above average suggesting that the total run size was greater. The outlook for 1988 had been good since parent years' escapements were good and recent years' survival trends were good in the district. Fishermen reported beluga whales present in the district as a possible cause, since they normally are absent. However, the numbers of beluga (~20) make predation an unlikely cause of the run's weakness (Frost personal communication).

Sockeye salmon catches were above average in July. Aerial surveys of the Kanektok River showed that sockeye salmon escapements were below average. In response, the two period a week schedule continued until 27 July, when coho salmon became the dominate species in the district (Table 13). This strategy resulted in the largest sockeye salmon catch (21,534) in the district's history (Table 3) and an escapement index of 30,400 sockeye salmon, 1600 less than the 32,000 objective.

Chum salmon are taken incidentally to the chinook and sockeye salmon fishery in District 4. The 1988 chum salmon catch of 29,183 was above the previous 5 year average of 26,400 (Table 3). The escapement index of 20,500 was 10,000 chums less than the average escapement of 30,500.

Coho salmon dominated the catch beginning with the 27 July fishing period. The fishing schedule was adjusted to three 12 hour periods per week on Monday, Wednesday, and Friday at that time. This schedule, when used in the past, has allowed adequate escapement. The fishery continued this schedule until 9 September. The fishery closes by regulation on 8 September, since that was a Thursday this year, the season continued until the 9th by emergency order. There was no catch or effort on the 9th due to the absence of processors.

The coho salmon catch of 68,591 was slightly above the previous 5 year average of 61,100 (Table 3). No escapement surveys have been possible because of

by the concurrent strong chum salmon and weak sockeye salmon runs. The tower count of chum salmon escapement, 20,000, exceeded the objective of 15,000.

On 1 August coho and pink salmon dominated the catch and a three 12 hour periods per week schedule to provide coincidental openings with District 4 began (Table 14). This schedule in the past has allowed adequate escapement. The fishery continued this schedule until 9 September. The fishery closes by regulation on 8 September. The season extension until the 9th allowed the fishery to close on a Friday. There was no catch or effort on the 9th because the processors left the district.

The 1988 coho salmon catch of 30,832 was very similar to the previous 5 year average catch of 31,150 (Table 5). Weather has prevented escapement surveys.

The pink salmon catch of 5,509 was slightly below previous 5 even years average of 6,153 (Table 5).

OUTLOOK FOR 1989

The Kuskokwim Area is still developing a data base for future return forecasts. Only broad range harvest projections are possible by examining the brood year's escapement and recent harvest trends.

Chinook Salmon

The brood year escapement for Kuskokwim River chinook salmon was 70 to 42 percent below objective levels in 1983 and 1984. The improved run strength in 1987 and 1988 makes a projection difficult. The trend of declining chinook salmon escapement that occurred from 1982-1986 may result in smaller returns. However, the improved survival evidenced by the 1987 and 1988 runs may provide an average chinook salmon run in 1989. This should result in an incidental commercial harvest of 19,000 to 56,000 chinook salmon (Table 15).

Chinook salmon escapements in the Kanektok River were above objective levels in the brood years for 1989. An average to above average return in 1989 should result from those escapements. The cause of the poor return in 1988 may cause 1989 to weaker than normal. The commercial harvest should be between 14,000 and 34,000 (Table 15).

In the Goodnews River chinook salmon achieved the escapement objectives during the 1983 and 1984 brood years. An average return of chinook salmon is expected in 1989 in the Goodnews Bay District. The commercial harvest in Goodnews Bay should be 2,800 to 8,600 chinook salmon (Table 15).

Sockeye Salmon

Quinhagak (District 4) and Goodnews Bay (District 5) are the only fisheries within the Kuskokwim area which target on sockeye salmon. Most sockeye salmon return at five years of age with a few maturing at four years. Sockeye salmon approached the escapement objective in 1984 and which should result in an average return to both districts. The commercial catch should be from 6,500 to 22,000 in District 4. The return in 1989 is expected to be average. The commercial catch should be 6,700 to 36,000 in District 5 (Table 15).

TABLES

Table 1. Estimated dollar value of Kuskokwim Area commercial salmon fishery, 1964 - 1988.

<u>YEAR</u>	<u>GROSS VALUE OF CATCH TO FISHERMAN</u>	<u>PERMITS FISHED^a</u>	<u>AVERAGE INCOME</u>
1964	83,030		
1965	90,950		
1966	87,466		
1967	138,647		
1968	290,370		
1969	297,233		
1970	362,470		
1971	371,220		
1972	360,727		
1973	827,735		
1974	1,056,042		
1975	899,178		
1976	1,380,229		
1977	3,891,950		
1978	2,337,470		
1979	3,678,000		
1980	2,725,134		
1981	3,766,525		
1982	4,213,954		
1983	2,670,400		
1984	5,809,000	774	7,505
1985	3,248,089	781	4,159
1986	4,746,089	789	6,015
1987	6,392,822	798	8,011
1988	12,514,492	811	15,431
FIVE YEAR AVERAGE (1983-1987)	\$4,573,280		

^a Permit holders who made at least one delivery. Information not available prior to 1983.

Table 3. Lower Kuskokwim River, District 1, and the middle Kuskokwim River, District 2, combined commercial salmon harvest, 1960 - 1988.

Year	Chinook	sockeye	Coho	Pink	Chum	Total
1960	5,969	0	2,498	0	0	8,467
1961	18,918	0	5,044	0	0	23,962
1962	15,341	0	12,432	0	0	27,773
1963	12,016	0	15,660	0	0	27,676
1964	17,149	0	28,613	0	0	45,762
1965	21,989	0	12,191	0	0	34,180
1966	25,545	0	22,985	0	0	48,530
1967	29,986	0	56,313	0	148	86,447
1968	34,278	0	127,306	0	187	161,771
1969	43,997	322	83,765	0	7,165	135,249
1970	39,290	117	38,601	44	1,664	79,716
1971	40,274	2,606	5,253	0	68,914	117,047
1972	39,454	102	22,579	8	78,619	140,762
1973	32,838	369	130,876	33	148,746	312,862
1974	18,664	136	147,269	84	171,887	338,040
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	535,497
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	742,267
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	267,698	566,225
1984	31,742	48,575	623,447	2,942	423,718	1,130,424
1985	37,889	106,647	335,606	75	199,478	679,695
1986	19,414	95,433	659,988	3,422	309,213	1,087,470
1987	36,179	136,602	399,467	43	574,336	1,146,627
1988	55,716	92,025	524,296	10,825	1,381,674	2,064,536
Five Year Average (1983-1987)	31,680	91,222	442,959	1,339	354,889	922,088

Table 5. Goodnews Bay District commercial salmon harvest,
1968 - 1988.

<u>YEAR</u>	<u>CHINOOK</u>	<u>SOCKEYE</u>	<u>COHO</u>	<u>PINK</u>	<u>CHUM</u>	<u>TOTAL</u>
1968			5,458			5,458
1969	3,978	6,256	11,631	298	5,006	27,169
1970	7,163	7,144	6,794	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	2,156	9,098	17,889	419	5,904	35,466
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	2,331	28,632	43,256	7,832	11,748	93,799
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
1985	5,793	6,698	16,498	8	4,784	33,781
1986	2,723	25,112	19,378	4,447	10,355	62,015
1987	3,357	27,758	29,057	54	20,381	80,607
1988	4,964	36,368	30,832	5,509	33,059	110,732
Five year Average (1983-1987)	6,920	17,352	31,154	1,844	11,325	68,595

Table 7. Lower Kuskokwim River, District 1, commercial effort
1970 - 1988.

<u>YEAR</u>	<u>UNRESTRICTED MESH SEASON</u>	<u>RESTRICTED MESH SEASON</u>	<u>COHO SALMON SEASON</u>	<u>TOTAL</u>
1970	361	a	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	61	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	587	619	654
1985	b	598	627	654
1986	b	631	663	688
1987	b	680	694	703
1988	b	c	c	746
Five Year Average (1983-1987)		622	636	676

- ^a No commercial salmon season.
- ^b No unrestricted mesh season.
- ^c Fishery continued without interruption

Table 9. 1988 Kuskokwim Area commercial salmon fishery final calculated value by district and area.

	<u>KINGS</u>	<u>REDS</u>	<u>CHUMS</u>	<u>SILVERS</u>	<u>PINKS</u>	<u>DISTRICT TOTAL</u>
<u>DISTRICT 1</u>						
(LOWER KUSKOKWIM)						
TOTAL FISH	53,810	89,764	1,361,982	508,417	10,805	2,024,778
TOTAL POUNDS	722,747	653,418	9,316,606	3,549,342	36,574	14,278,687
TOTAL DOLLARS	\$939,571	\$927,853	\$3,726,642	\$4,436,677	\$5,486	\$10,036,230
AVERAGE WEIGHT	13.43	7.28	6.84	6.98	3.38	
<u>DISTRICT 2</u>						
(MIDDLE KUSKOKWIM)						
TOTAL FISH	1,906	2,261	19,692	15,879	20	39,758
TOTAL POUNDS	26,995	15,724	137,018	107,063	63	286,863
TOTAL DOLLARS	\$35,093	\$22,328	\$54,807	\$133,828	9.45	\$246,066
AVERAGE WEIGHT	14.16	6.95	9.96	6.74	3.15	
<u>DISTRICT 4</u>						
(QUINHAGAK)						
TOTAL FISH	13,872	21,534	29,183	68,591	21,258	154,438
TOTAL POUNDS	222,372	156,355	214,344	550,565	77,900	1,221,536
TOTAL DOLLARS	\$289,083	\$222,024	\$85,737	\$688,206	\$11,685	\$1,296,736
AVERAGE WEIGHT	16.03	7.26	7.34	8.03	3.66	
<u>DISTRICT 5</u>						
(GOODNEWS BAY)						
TOTAL FISH	4,964	36,368	33,059	30,832	5,509	110,732
TOTAL POUNDS	82,308	281,405	267,709	255,297	17,714	904,433
TOTAL DOLLARS	\$107,000	\$399,595	\$107,083	\$319,121	\$2,657	\$935,457
AVERAGE WEIGHT	16.58	7.74	8.1	8.28	3.22	
<u>TOTAL ALL DISTRICTS</u>						<u>TOTAL</u>
WT. AVE. PRICE/LB	\$1.30	\$1.42	\$0.40	\$1.25	\$0.15	<u>ALL AREAS</u>
TTL \$/SPECIES	\$1,370,748	\$1,571,800	\$3,974,270	\$5,577,833	\$19,837	\$12,514,491
PRICE/FISH	\$19.57	\$10.38	\$3.22	\$9.38	\$0.50	
AVERAGE WEIGHT	15.05	7.31	8.06	7.51	3.35	

Table 11. 1988 Middle Kuskokwim (W-2) final seasonal summary.

Date	Permits	Lndgs.	CATCH											
			CHINOOK		SOCKEYE		COHO		PINK		CHUM			
			NO.	LBS.	NO.	LBS.	NO.	LBS.	NO.	LBS.	NO.	LBS.		
6/24	13	14	669	8,718	1,041	7,179							4,232	30,169
6/28	17	21	76	10,604	639	4,436							6,087	43,290
7/02	19	20	468	7,320	579	4,099							8,155	56,106
8/08	14	14	6	119			1,465	9,880	3	9			308	1,983
8/10	16	16	10	120			3,823	25,401	6	18			312	1,826
8/12	20	20	3	50			5,216	34,959	5	16			244	1,444
8/15	21	21	1	20	2	10	2,317	15,621	4	12			144	861
8/18	15	15	2	20			1,485	10,210	1	3			116	737
8/20	17	17	1	24			1,573	10,992	1	5			94	602
Total	29	158	1,906	26,995	2,261	15,724	15,879	107,063	20	63			19,692	137,018
Average				14.16		6.95		6.74		3.15				6.96

Table 13. 1988 Quinhagak (W-4) final seasonal summary.

Date	Permits	Lndgs.	CATCH										
			CHINOOK		SOCKEYE		COHO		PINK		CHUM		
			NO.	LBS.	NO.	LBS.	NO.	LBS.	NO.	LBS.	NO.	LBS.	
6/13	202	207	1,716	28,791	151	1,085						1,092	8,533
6/16	94	102	1,179	21,555	277	2,143						847	6,552
6/20	88	99	803	13,722	367	2,545			2	10		746	5,617
6/28	69	127	4,089	65,394	2,413	18,564						5,449	42,133
7/02	98	134	1,891	32,264	3,121	23,826						4,337	32,819
7/05	62	76	967	15,023	2,295	16,849				5	15	3,303	25,102
7/08	71	94	918	13,567	2,453	17,685				38	123	3,672	26,536
7/11	66	83	621	8,250	3,369	23,974				67	197	2,940	20,968
7/14	64	93	596	9,134	3,465	24,956				159	554	1,748	12,336
7/18	73	80	202	2,599	1,454	10,162				760	2,805	1,310	9,097
7/21	79	79	162	2,433	769	5,260	1	6		1,709	6,215	1,380	9,449
7/25	61	63	135	1,703	393	2,674	15	94		519	3,565	2,865	10,719
7/27	49	54	93	1,196	253	1,573	273	1,808		1,972	7,619	320	2,146
7/29	55	61	104	1,216	212	1,392	565	3,929		2,943	11,112	353	2,360
8/01	69	75	54	712	129	815	1,315	9,554		2,231	8,335	246	1,480
8/03	72	73	74	898	81	530	2,793	20,055		1,809	6,586	247	1,510
8/05	60	70	40	612	46	351	4,517	35,114		1,133	3,721	98	607
8/08	67	72	59	684	94	608	2,991	22,772		1,597	5,721	106	656
8/10	57	87	19	385	10	77	5,298	42,939		278	924	43	273
8/12	73	86	45	689	64	537	3,033	24,210		1,168	4,530	47	297
8/15	77	118	36	561	31	183	15,733	129,037		594	1,925	53	320
8/17	107	112	24	391	18	115	2,775	21,827		415	1,397	15	93
8/19	75	82	14	186	13	94	4,373	35,078		257	945	15	99
8/22	86	91	11	152	6	40	4,502	36,657		329	1,171	13	87
8/24	84	112	5	60	16	112	8,673	72,060		389	1,431	7	42
8/26	86	99	17	255	14	100	4,825	39,357		242	887	8	52
8/29	70	74	4	33	6	42	2,701	22,512		118	457	3	19
8/31	56	66	3	37	11	69	1,524	12,176		99	314	3	19
9/02	40	41			4	38	558	4,472		50	142		
9/05	34	37	2	25	16	93	1,012	8,286		58	166	5	33
9/07	29	31			5	28	609	5,142		23	94	1	8
9/09	0	0											
NO COMMERCIAL FISHING -- NO BUYERS													
Total	288	2,678	13,883	222,527	21,556	156,520	68,605	550,650	21,310	78,115	29,220	214,609	
Average				16.03		7.26		8.03		3.67		7.34	

1988 Quinhagak (W-4) confiscated landings.

Date	Permits	Lndgs.	CATCH										
			CHINOOK		SOCKEYE		COHO		PINK		CHUM		
			NO.	LBS.	NO.	LBS.	NO.	LBS.	NO.	LBS.	NO.	LBS.	
7/18	1	1	10	120	18	130				1	3	27	200
Total	1	1	10	120	18	130				1	3	27	200
Average				12.00		7.22					3.00		7.41

Table 15. Preliminary projections of the 1989 Alaska commercial salmon harvests in thousands of fish by management region and species.

<u>Species</u>	<u>Management Region</u>		<u>Total</u>
	<u>Kuskokwim River</u>	<u>Kuskokwim Bay</u>	<u>Kuskokwim Area^a</u>
Chinook	19 - 56	17 - 43 ^b	36 - 99
Sockeye	48 - 137	15 - 58	63 - 195
Coho	196 - 400 ^c	48 - 92 ^d	244 - 492
Pink	0 ^e	0 ^e	0 ^e
Chum	199 - 1,380	13 - 83	212 - 1,463
Total	462 - 1,973	93 - 276	555 - 2,249

- a Except as noted all the projections are based on the previous (1983-87) average catches in all districts.
- b The chinook salmon catches in Kuskokwim Bay have declined in recent years. The projection is based on the recent 5 year average (1984-88) to exclude the record catches made in 1983.
- c Kuskokwim River coho salmon have displayed a strong odd-even cycle in recent years. This projection is based on the average odd year catch for the previous 10 years.
- d The 1984 coho salmon catches were the largest on record and 40% above average. The projection is based on the recent (1985-88) four years to exclude the unusually high 1984 catches.
- e Pink salmon catches are typically less than 100 in both the river and the bay during odd years.

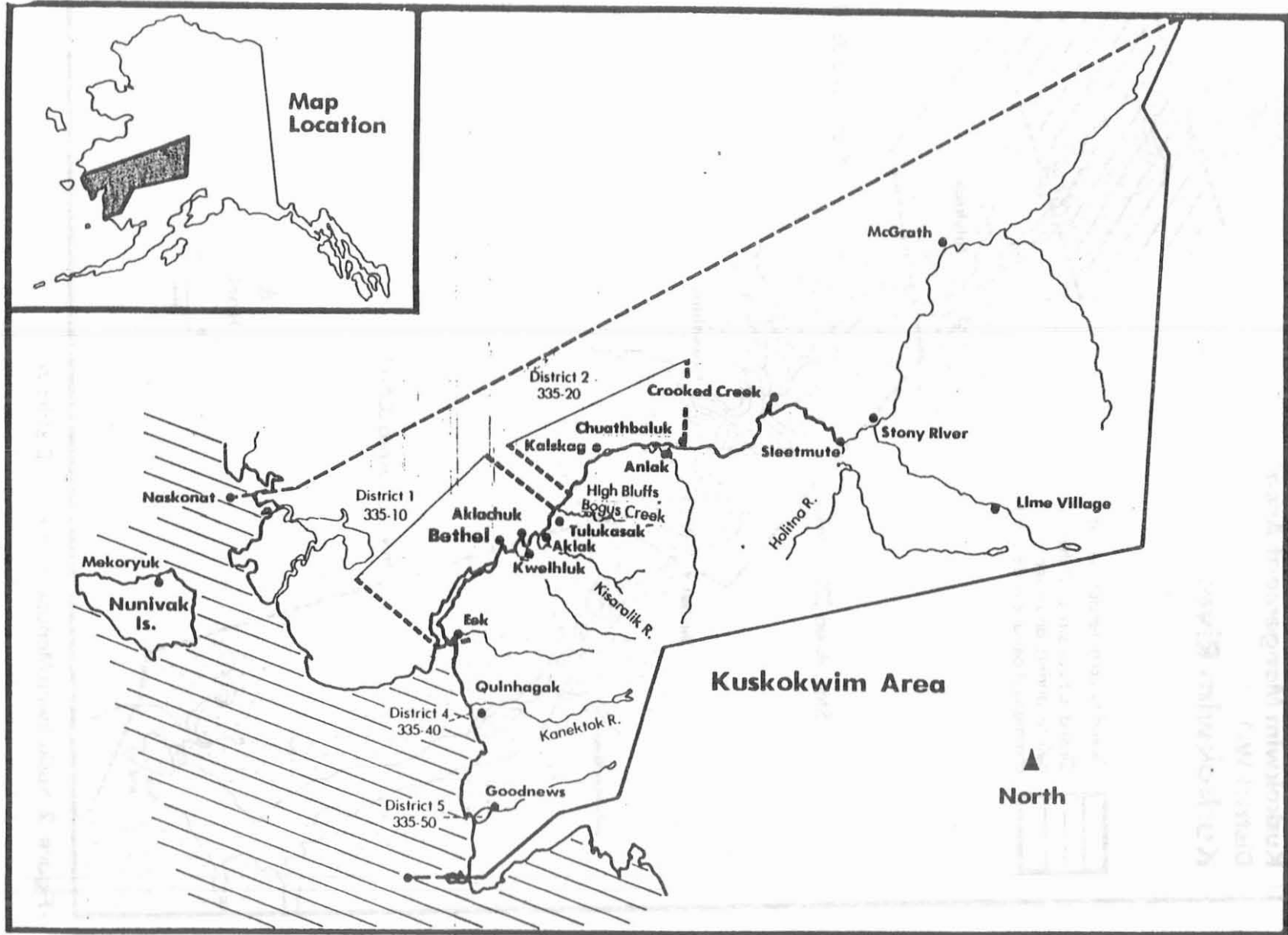


Figure 1. Kuskokwim Area Map.

**Kuskokwim Mangement Area District W-2
Kuskokwim River**

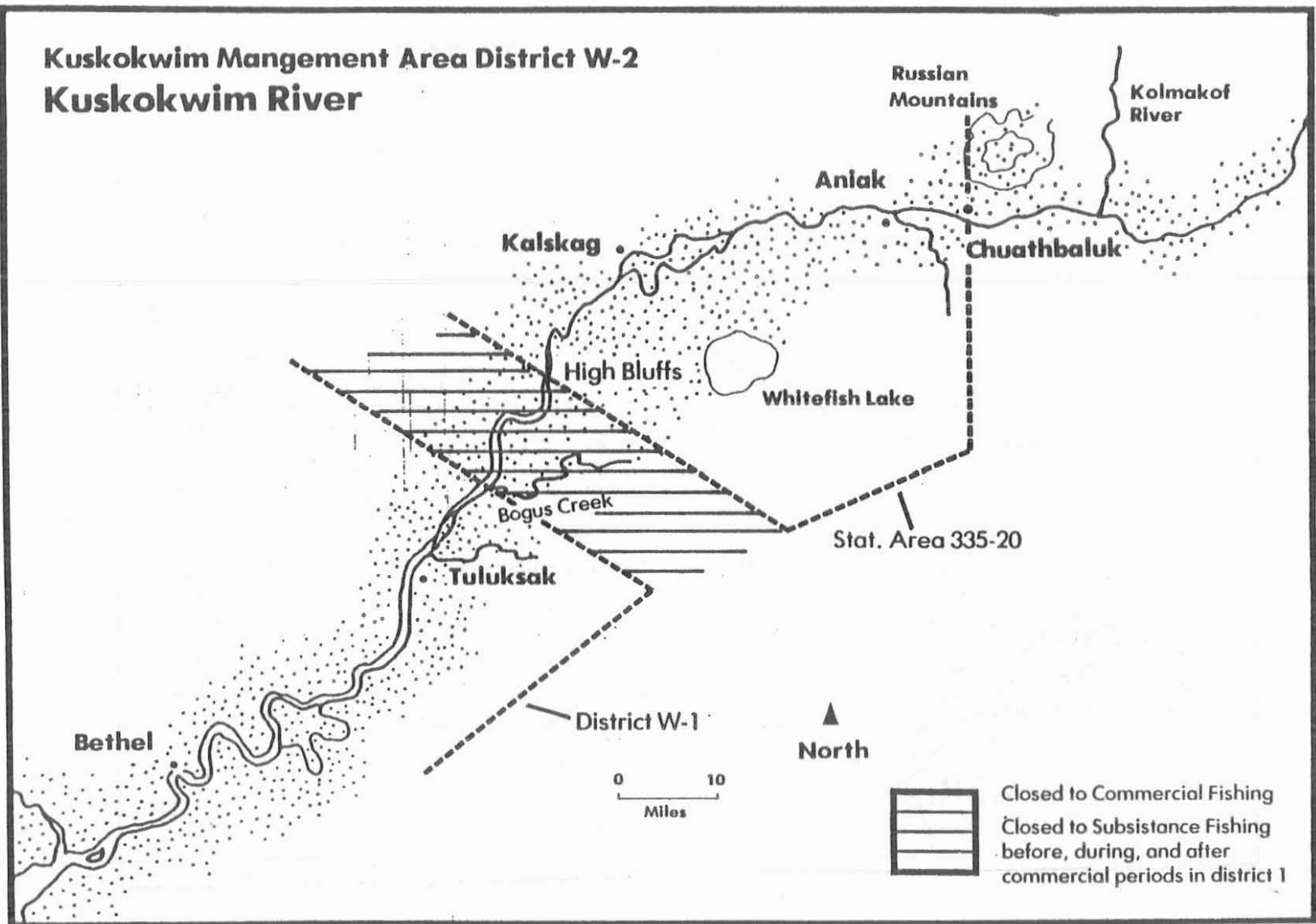


Figure 3. Kuskokwim Management Area, District W-2

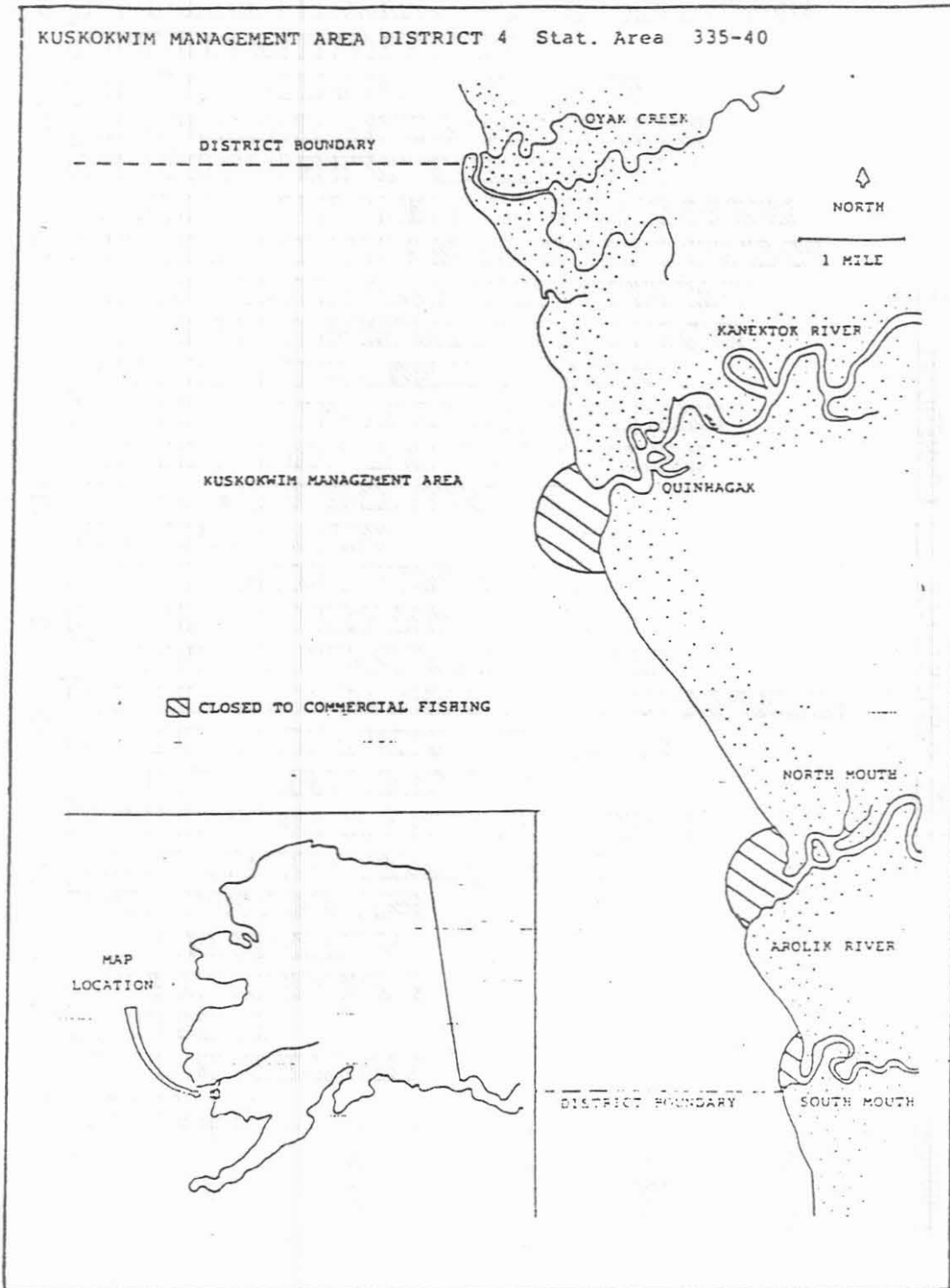


Figure 4. Kuskokwim Management Area, District W-4

