

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES

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KUSKOKWIM AREA

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PREFACE

This report presents all available information concerning the management of commercial and subsistence salmon, herring and miscellaneous fisheries in the Kuskokwim area. Although data from many special research projects are included in this report, complete documentation of these projects and results will be presented in separate reports.

Data presented in this report supercedes information found in previous management reports. An attempt has been made to correct errors in previous reports, and previously unrecorded data have been incorporated into this report which are indicated by appropriate footnotes.

This report is organized into the following major sections:

A. Salmon Fishery

1. Area Introduction. This is a general and brief description of the area, its inhabitants, fishery resources, fisheries and management practices.
2. Area Summary. This section summarizes current year data for the area and makes comparisons with previous years.
3. District Reports. There are several unique and separate fisheries in the area, and separate comprehensive reports are presented for each.

B. Herring Fishery

1. Area Introduction and Fishery History. This is a general description of the area where herring occur in the Kuskokwim Region. Included is a brief history of the commercial and subsistence herring fishery from Cape Newenham north to the Naskonat Peninsula.
2. District Summaries. This section summarizes current year commercial fishery data, district stock status, enforcement activities, and management strategies for the 1983 season.

C. Whitefish Fishery

1. History. This is a general and brief description of the historic subsistence and commercial Kuskokwim River whitefish fishery.
2. River Summary. This section summarizes current year data for the Kuskokwim River.

In order to facilitate use of this report, the tabular data has been separated into current year tables and appendix tables where annual comparisons are made. The text for each major section is followed by current year tables and then appendix tables.

Effort and catch per unit effort are derived as follows: total boat (or fisherman) hours are computed by arbitrarily assuming that if a fishing boat

delivers in any 24 hour fishing period, it fished the entire period. If the period was more than 24 hours long, then the vessel is assumed to have fished the complete period for as many hours as were open to commercial fishing. The resulting figure, total fisherman hours, is then divided into the catch during the same period to obtain catch per fisherman (or boat) hour.

"Total fishermen" (or boats) is the total number of fishermen making deliveries, irrespective of the number of deliveries made or of days fished during a particular "season." There are a number of fishermen who deliver only once or twice during the entire season.

"Total days fished" is the total number of hours open for commercial fishing during the season divided by 24.

Commercial catch information presented for the current year is derived from field data and not from finalized computer tabulations. Commercial catch data through 1975 are derived from final computer tabulations.

INTRODUCTION

Area and District Boundaries

The Kuskokwim area includes all waters of the Kuskokwim River drainage and all waters of Alaska between Cape Newenham and the Naskonat Peninsula (Figure 1). The present commercial salmon fishing area is divided into 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 shoreline adjacent to the village of Quinhagak); and district 5 (Goodnews Bay). District 3 (upper Kuskokwim River above the Kolmakof River) has been closed to commercial fishing since 1966 (Figure 1). Appendix Table 1 shows the relative distances, in river miles, from three sites on the Kuskokwim River to various locations in the area. Commercial herring fisheries occur in the Security Cove district (Cape Newenham to northernmost point of Carter Spit) and in the Goodnews Bay district.

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). The largest populations of kings, chums and cohos are found in the Kuskokwim River drainage, while reds and pinks are more numerous in the Kanektok and Goodnews River systems.

Other important species common to the area include: Pacific herring (Clupea harengus pallasii), inconnu or "sheefish" (Stenodus leucichthys), several species of whitefish and cisco (Coregonus sp.), Alaska blackfish (Dallia pectoralis), northern pike (Esox lucius) and burbot or "lush" (Lota lota). Additional species are listed in Appendix Table 2.

Commercial Fishery

Although the Kuskokwim area commercial salmon fishery is the oldest in the AYK region with catches reported as early as 1913, commercial fishing did not mature for a half century. For many years, small commercial mild-cure operations were conducted in or near Kuskokwim Bay while the Kuskokwim River fishery remained virtually undeveloped. During the 1930's when dog teams were intensely utilized for freight hauling, a "quasi-commercial" fishery operated in the McGrath area for the sale of dried, subsistence caught salmon for dog food. However, this fishery declined with the declining use of dog teams and the Kuskokwim area experienced little additional commercial effort until Alaska became a state more than twenty years later (Appendix Table 3).

Commercial salmon and herring fishing activities have grown significantly since statehood as area fishermen have been making the difficult transition from a subsistence culture to a cash economy. This has affected fishing effort and has resulted in a tremendous expansion in fishermen numbers and in increased, sustained effort. Fishing vessels have remained virtually unchanged over the years, but increased utilization of highly mobile nylon drift nets has greatly improved the efficiency of the fleet. The overall expansion of the commercial fishery could not have been accomplished without improvements in processing and tendering facilities that have occurred throughout the area.

King, red, coho, pink and chum salmon are of primary commercial significance in the Kuskokwim area. The vast majority of the salmon catch is transported from the area as a fresh or frozen product. Coastal residents commercially utilize Pacific herring in a spring sac roe and bait fishery. Sheefish and whitefish are harvested incidentally to the salmon catch, and a limited fall and winter whitefish fishery is conducted to satisfy local market requirements.

Subsistence Fishery

Area residents have long depended upon the fishery resources as a source of food. Until relatively recently, traditional fishing methods and materials limited the size and scope of the fishery. Spears, dip nets, fish traps, and willow or caribou strip gillnets were slowly supplanted by more efficient linen gillnets. This enabled the fishery to expand tremendously. Herring, whitefish, cisco, blackfish, pike, burbot and sheefish have been historically utilized along with salmon.

The majority of the salmon catch is represented by chum salmon. Since statehood, improvements in fishing gear, notably the introduction of nylon gillnet webbing, have probably increased the harvest and importance of king salmon. Estimated peak subsistence salmon harvest levels were reached during the 1930's coincidental with peak activity of the quasi-commercial McGrath fishery, but records indicate a continuing decline of this fishery into the 1940's. Little catch data is available for the twenty year period prior to statehood (Appendix Table 3).

Today the value of the subsistence fishery to local people remains as important as money realized from the commercial fishery. However, several factors, as yet not totally defined, are affecting the complexion of the

subsistence fishery. These factors include:

- (1) Increasing commercialization of subsistence products.
- (2) Cultural changes of local residents.
- (3) Various state and federal social-aid programs.

Management of the Kuskokwim area fishery resources must take into account the growing and changing requirements of the subsistence fishery.

Management Program

The Division of Commercial Fisheries of the Alaska Department of Fish and Game (ADF&G) is responsible for the management of the commercial and subsistence fisheries within the Kuskokwim area. The permanent staff assigned to this area includes one management biologist, one assistant area biologist, and three project biologists (one herring, two salmon). In addition, 20-24 summer employees are hired each season to assist the permanent staff in conducting various management and research studies.

The main objective of the Department's program is to manage the commercial fisheries on a sustained yield basis in addition to obtaining needed information to determine the potential for commercial fisheries on other species such as capelin, pike and whitefish. Present commercial fishing regulations are relatively restrictive in order to insure that sufficient fish are provided for subsistence fishery and spawning ground requirements.

The basic regulation that governs the commercial salmon harvest in all districts is the scheduled weekly fishing period. Commercial fishing is normally allowed from 6 to 12 hours a week during the open season, dependent upon the district and species involved. Fishing effort usually occurs during the entire run and not just during any particular segment of the run. Duration of the actual fishing period is dependent upon fishing conditions, the strength of the runs or spawning escapements as determined by special studies conducted by the Department.

Due to the vast size of the area and the turbid nature of many streams, accurate estimates of the size of salmon runs and the spawning escapements are difficult to obtain. Fishery management is also hampered by the relative lack of comparative catch and return information since all the fisheries have been expanding through regulation changes since their initiation in 1961 and 1962. The management problem is further compounded by having to provide sufficient escapement after commercial fishing for the important subsistence fishery as well as for spawning purposes.

For these reasons the present commercial fishery is still considered to be somewhat experimental in nature. It has been a policy of the ADF&G to increase conservatively the recent levels of commercial utilization for a few years in order to establish definite trends in subsistence utilization and to obtain more information on the relationship between the catch and return.

If there is no apparent change in population size, it is the Department's policy to increase commercial utilization once trends in declining subsistence

utilization can be established. It should be pointed out that increases in commercial fishing effort and efficiency have occurred and may balance any immediate decline in subsistence utilization with the result that present regulations will be maintained or even made more restrictive.

A unique problem in the area is the so called language barrier. Many of the older native people cannot read or speak English. Therefore, the staff must use translators when conducting the many public meetings that are annually conducted throughout the area. While it may normally take only half an hour or so to conduct a public meeting or hearing in English, it usually takes two to three times that long when Eskimo translators are used. In addition, many special regulation notices are broadcast over local radio stations in both English and Yupik. To assist in the information and education program, a weekly fishery program is broadcast over radio KYUK in Bethel during the summer months. Additionally, the Department contributes to a weekly newspaper, The Tundra Drums.

SALMON

AREA SUMMARY — COMMERCIAL FISHERY

Fishing Effort

In recent years, fishermen participation levels have risen in general. The lower Kuskokwim River (district 1) and the Quinhagak area (district 4) have become the centers for most Kuskokwim district fishermen. This is due to the close proximity to population centers and the liberal harvest goals associated with these fisheries. The district 2 (middle Kuskokwim River) and district 5 (Goodnews Bay area) fisheries have remained fairly stable in terms of the number of fishermen working in these areas. This is due to the relative remoteness and smaller harvest levels associated with these fisheries. Appendix Table 4 shows the effort levels in each district over the past twelve years.

Recent increases in fishing effort may appear to be somewhat of a contradiction considering that Limited Entry was initiated in 1976 for the Kuskokwim Area. At that time a finite number of permits were issued to fishermen based on points earned by past participation in the fishery. Some families were eligible for more than one permit, likewise many elderly fishermen were eligible. Many of these fishermen, after having received a permit, did not immediately participate in the fishery. These inactive permits have since been transferred and/or sold to more aggressive fishermen. In 1982, 810 Kuskokwim area permits were renewed (Table 4).

Ninety-nine percent of all Kuskokwim entry permit holders are residents of the area. These fishermen move freely between districts so registration data does not correspond with the total number of fishermen who fished each district. The total number of fishermen making deliveries at least once in each district was: 335-10, 686; 335-20, 60; 335-40, 177; and 335-50, 48 (Appendix Table 4).

Catches

The 1982 commercial salmon catch of 1,088,713 fish was the largest catch ever recorded, exceeding the previous record set in 1980 by over 79,000 fish (Appendix Table 3). The 1982 catch was 27% above the previous five-year average of 793,513 fish. Species composition was 79,816 kings, 97,716 reds, 567,451 cohos, 18,259 pinks, and 325,471 chum salmon (Table 5).

The king and coho salmon catches were at record levels. The pink salmon catch was up, typical for even year runs.

Commercial catches of all species throughout the season were strongly influenced by intense, consistent fishing effort, increased fleet efficiency, and a good run of salmon.

Average 1982 salmon weights are presented in Table 6.

Buyers and Processors

Table 3 includes all buyers and processors that operated during 1982 in each district.

Fewer processors operated in the lower Kuskokwim River than have in many

years. Due to financial problems and internal struggles experienced in early June, the only large freezer plant in the area did not operate this season. A total of three companies operated in this district throughout the year and appeared to adequately handle the 1982 salmon harvest. Four and 11 companies operated in the Quinhagak and Goodnews Bay districts respectively.

Appendix Table 7 compares the 1981 pack to previous years and Appendix Table 8 presents the mean salmon weights and the prices paid to fishermen since 1964.

King salmon, which are sold primarily on the fresh and fresh frozen markets, are exported from the Kuskokwim area after they are gutted and iced. The majority of the other species are flown from the area gutted and iced or are frozen and transported by barge. At this time there are no canneries operating in the area. Approximately 100,000 pounds of chum salmon were salted and transferred to a Japanese tramper in the Bethel port during the 1982 season.

Economic Value

Commercial fishermen received approximately \$4,214,000 for their catch in 1982 (Appendix Table 9). This reflects a record value of the catch to the fishermen, exceeding the previous record set in 1977 by slightly more than \$300,000. A minimum of \$350,000 in wages was estimated to have been earned by processing plant employees and tenderboat operators.

Enforcement

The Department staff, together with the Division of Fish and Wildlife Protection, initiated the most aggressive enforcement program the Kuskokwim area has experienced in a long time. Numerous contacts were made throughout the season resulting in 131 cases initiated, 117 of which went to court. These cases appear to be an indicator of the condition this fishery has been in for sometime. Common violations cited during the season were commercial fishing without proper licensing, and closed waters violations of both a subsistence and a commercial nature.

Fishing prior to the commercial opening during the coho salmon season is a problem that continues to plague the fishery in all four districts. Numerous complaints were received by the Bethel ADF&G office from concerned fishermen reporting these situations during the later part of August.

As in the past, the Department of Fish and Game vigorously pursued a program of informing the public of regulation changes by utilizing the local radio station, CB radio, telephone and by personal contact.

Emergency Orders

A listing of emergency orders issued during the 1982 season describing actions taken and justification of each is presented in Table 1.

Special Studies

Table 2 summarizes objectives and results of projects operated during 1982 in support of management of the salmon fisheries.

KUSKOKWIM RIVER (Districts 1 and 2)

Commercial Fishery

The greatest amount of fishing effort and the largest commercial salmon catches occur within the 108 mile-long district 1 (Stat. area 335-10). There are 12 villages and at least 15 temporary fish camps located within the boundaries of this district. A majority of the district residents utilize the fishery resources for both commercial and subsistence purposes.

Set gillnets and drift gillnets are the legal types of commercial gear that can be operated in the Kuskokwim River. The gillnets cannot exceed 50 fathoms in length. After June 25, a six-inch maximum mesh size restriction is in effect in the commercial chum salmon fishery located below the city of Bethel.

Lower Kuskokwim River commercial fishermen operate highly mobile drift gillnets. This type of fishing involves laying out 35 to 50 fathoms of gillnet from a skiff and then drifting with the river current. Drift net fishing requires a section of river that is relatively free of snags. Set gillnets are not utilized to a great extent by commercial fishermen and are used mainly for subsistence fishing. Commercial set gillnets are fished in small eddies along the bank of the Kuskokwim River and larger eddies out in the main river. Set gillnetting is done with much shorter nets, usually 5 to 15 fathoms in length, which tend to be more poorly constructed than do the drift gillnets.

Although there are no mesh size restrictions on nets operated in the lower district through June 25, most nets used during this time consist of 8-1/2 inch stretched mesh webbing. After June 25, a six inch stretched mesh size limitation is in effect and most nets consist of 5-1/4 - 5-1/2 inch stretched mesh. Depths of nets are restricted to a maximum of 35 meshes for nets over six inches in stretched mesh and a maximum of 45 meshes for nets six inches or smaller in stretched mesh measure.

Kuskokwim River skiffs are long and narrow with a high bow. Generally, boats vary from 16 to 32 feet (23 foot average) in length and 2-1/2 - 3 feet in deck width. Boats are generally poor for fishing as they are unstable, too narrow for a stern roller, and the sides and stern are too low to carry much of a load. In recent years, however, more sophisticated vessels are entering the fishery including jet boats and larger diesel vessels that are used to fish herring on the coast.

Several important regulations affecting commercial fishing efforts on the Kuskokwim River are:

- 1) Until June 26, commercial fishing periods are regulated by emergency order. This allows scheduling of the king salmon harvest throughout a greater portion of the run. This is necessary because of the intensive nature of the king salmon fishery.
- 2) Commercial fishing periods are most often limited to two 6-hour periods each week during the "chum salmon season". This helps offset the increased effort and efficiency of the fleet and distributes the allowable harvests over a greater portion of the salmon run.

- 3) Commercial fishing is allowed only below Bethel (the lower 86 miles of river) during the "chum salmon season" (June 26 - July 31). Only gillnets of six-inch stretch mesh or less can be used during this time. Restricting fishing to the lower portion of the district enhances fish quality, helps prevent excessive harvest and wastage, and allows subsistence demands to be met. The gillnet mesh restriction minimizes the capture of king salmon, particularly the larger, more fecund females.
- 4) Subsistence fishing is prohibited for 24 hours before, during, and for 6 hours after each commercial fishing period in district 1 prior to June 25 and from August 1 to August 31. During the "chum salmon season" (June 26-July 31), only the lower district below Bethel is closed to subsistence fishing in conjunction with commercial periods. This regulation reduces the sale of illegal salmon and provides for a more even escapement distribution. It also reduces fish wastage as subsistence fishermen are required to check their gear at regular intervals throughout the commercial fishing season.
- 5) After July 31, commercial fishing periods are again regulated by emergency order. This allows fishing effort to be regulated according to the magnitude of the variable coho salmon run. It also allows fishing time to be altered to insure maximum fisherman safety during poor weather conditions in August.

A limited commercial fishery is also conducted in the 65 mile long district 2. Commercial fishermen in this district operate under conservative regulatory harvest guidelines of 2,000 to 4,000 king salmon, 4,000 to 8,000 chum and red salmon, and 2,000 to 4,000 coho salmon. The majority of commercial catches are taken in the Kalskag area, while the remainder of the district is primarily devoted to subsistence fishing. Similar to the downriver district 1 fishery, set and drift nets are operated in this district with drift nets preferred.

King Salmon

Only since statehood have king salmon stocks been significantly used by Kuskokwim River fishermen. King salmon commercial and subsistence harvests averaged only 56,237 fish for the 10-year period 1960-1969, but increased to 81,383 during 1970-1979. Commercial effort has increased since the 1979 king season in both districts. The total commercial and subsistence king salmon harvest in 1982 was 105,937 fish (Appendix Table 10); this is the third greatest catch ever recorded, exceeded in 1970 and more recently in 1981.

Annual commercial catches ranged between 30,000 and 40,000 king salmon from 1968-1972. A commercial harvest guideline as defined in the Management plan, has been kept within this range in an attempt to stabilize the fishery until additional data regarding run size and escapement was obtained. Small runs were experienced during the years 1974, 1975 and 1976 indicating that this harvest range may have been too optimistic. Commercial harvests since 1976 have ranged from 30,000-48,000 fish taken throughout all seasons.

The majority are harvested during the "king salmon season" in early June when

no mesh size restriction exists. A few thousand additional fish are incidentally taken during later seasons when fishing is directed to other species.

Runs appear to have increased in recent years, perhaps resulting from the institution of the "200 mile limit" when fishing pressure was reduced on the high seas.

The "king salmon season" in the lower district is not opened until subsistence catches indicate the early portion of the king salmon run has reached the Kalskag-Aniak area and relatively good sustained catches are being made at the Department's test fishing site at Kwegoooyuk (56 river miles below Bethel). The late opening of the king salmon season helps to prevent overharvest of the early run and gives subsistence fishermen an opportunity to begin fishing without interference from the commercial fishery.

In 1982 the ice on the Kuskokwim River first moved on May 18 at Bethel and the river was completely free of ice by May 22. The first reported king salmon was caught on June 1 (Appendix Table 12).

Commercial salmon fishing opened for king season in the lower Kuskokwim River on June 14. A total of 22 hours of commercial fishing was allowed during this season ending June 24, three six hour periods and one four hour period (Table 7). This was the most liberal fishing schedule for this district since 1978 when due to bad weather the king fishing season was opened for a total of 30 hours. A total of 610 fishermen harvested a record 38,088 kings in this district. The harvest surpassed the previous record for king season catch only set in 1978 by two thousand fish. The catch per fishermen hour (CPUE) for the season was 3.6, the lowest since 1976 when the season's CPUE was recorded at 3.5 (Appendix Tables 11).

King salmon weighed an average of 21.5 pounds and brought an average \$.82 a pound in district 1 (Table 6).

The incidental catch of king salmon in district 1 totaled 7,358 fish taken after the 24th of June. This resulted in a total commercial king salmon harvest for this district of 45,449 fish.

In District 2, the middle Kuskokwim River, a total of 2,113 king salmon was harvested in 18 hours of open commercial fishing during the king salmon season. The season opened June 17 with each of the three six hour fishing periods opened on the same schedule as established in district 1. Thirty-eight fishermen made at least one landing resulting in a seasonal CPUE of 5.2. Fishermen received an average \$.85 per pound for kings in this district. The incidental catch of kings for district 2 was 672 landed after June 24, resulting in a total commercial king salmon harvest of 2,785 fish (Table 8).

The total king salmon commercial catch for the Kuskokwim River was 48,234 fish, 15% higher than the previous five year average (Appendix Table 10).

The overall king run was judged average in magnitude.

Chum Salmon

Prior to 1971, chum salmon catches represented only fish taken incidentally to the king and coho salmon fisheries. A commercial chum fishery was initiated in 1971 due to several factors:

1) Early subsistence catch estimates for the period 1924-1943 indicate an average annual catch of 448,000 chum salmon, compared to an average 221,000 chum salmon taken yearly during the 1960-1970 period. This represents a reduction of 227,000 fish per year. This subsistence harvest reduction is believed to have been largely influenced by lessening dependence on subsistence fishing.

2) There are a minimum of 16 known chum salmon spawning tributaries in the Kuskokwim River system. Most of these streams cannot be surveyed annually due to fund limitations and adverse stream or weather conditions. Usually, not more than three tributary streams can be adequately surveyed in any given season, but as many as 185,000 spawning chums have been counted. This indicated a significant chum salmon population.

3) Commercial catches are believed to provide information regarding the size, timing and magnitude of the chum salmon run, as well as the age, sex and size composition of the run.

Total utilization figures (commercial plus subsistence) have increased steadily since the inception of the commercial chum salmon fishery with a record high of 646,947 fish caught in 1980. This figure was substantially above the previous 1977 record harvest, and was 48% above the previous five-year average (Appendix Tables 13 and 14).

The "chum salmon season" in district 1 is normally opened after June 25 below markers placed at the City of Bethel. Commercial fishermen must use nets of 6-inch or smaller stretched mesh. The delayed opening dates combined with the mesh restriction minimizes incidental harvests of king salmon, while restricting commercial fishing to the lower portion of district 1 allows subsistence fishermen to meet their requirements.

This season's total commercial chum catch of 278,306 for the entire Kuskokwim River indicated an average run based on comparative catch and escapement information (Table 5). Commercial fishing effort totaled 576 fishermen, and was below the previous five year average of 590 fishermen (Appendix Table 4).

Unlike the king salmon run, the Kuskokwim River chum salmon run was a little early this season with the major strength of the run occurring during the last week of June. The first chum was caught in the Department's test nets on June 9 at Kwegooyuk. Good numbers of chums were incidentally caught during the king season with district 1 fishermen landing 30,170 chums from June 14 through 24. The average weight of the chum salmon was unusually large early in the season averaging 9 pounds per fish. Good catches and the size of the chums landed during the later part of June indicated that the Kuskokwim River might experience another extremely strong run similar to those in 1980 and 1981. It was the intention of the management staff to allow greater commercial harvest if this were the case based on the documented escapements during those years. Unfortunately fewer processors operated in district 1

than have operated in past years. In an effort to allow an increased commercial chum harvest and to do so in an orderly manner that available processors could handle, a new fishing schedule of three, four hour commercial fishing periods per week was established beginning June 28. This allowed fishermen an opportunity to fish three different tides, make that first clean drift three times rather than twice, and hopefully be able to deliver fish more quickly and not deal with long lines. Recognizing that a third opening might present a problem for subsistence fishermen by reducing their fishing time, and not meaning to reduce the subsistence opportunity in favor of increased commercial fishing time, the 24 hour subsistence closure that occurs before the Wednesday commercial fishing period was waived. It was known that this could present the potential problem of subsistence fish being illegally sold in the commercial fishery, however at that point the responsibility was placed on the fishermen's shoulders. It was a compromise.

The three, four hour week fishing schedule was used for the week of June 28 through July 2 in order to evaluate how well this schedule would assist the fishery, fishermen and industry.

By early July it became apparent that either the chum salmon run was not as strong as originally indicated or the run peaked early and was falling off. A fishing schedule of two six hour commercial fishing periods per week was then established for the remainder of the season. The commercial chum fishery in district 1 closed July 12.

Commercial fishermen were permitted a total of 30 hours open fishing time for the "chum salmon season" in which they landed 224,185 chum salmon. The 1982 chum harvest was approximately 82,100 below the previous 5 year average of 306,180 chums. The five year average has been greatly inflated by the unusually strong chum salmon catches made in 1980 and 1981. Prior to those years the five year average of 205,617 chum salmon compares closely to the 1982 harvest. The CPUE for the season was 18.6; 6.1 fish less than the previous five year average.

Chum salmon weighed an average 7.2 pounds per fish and brought an average \$.22 a pound in district 1 (Table 6).

The chum season in district 2 was open for a total of 12 hours with 15,871 chum salmon harvested between July 2 and 5. Fifty fishermen made at least one landing with a CPUE for the season of 37.3 fish (Table 8). The majority of district 2's harvest was made early in July consequently the average weight was a bit heavier than the district 1 catch. Chum salmon weighed an average 7.5 pounds per fish and brought the same price as district 1 fish.

Red Salmon

For the second season red salmon were accurately separated from chums in the commercial catches of district 1 and 2 of the Kuskokwim River. A total of 31,233 reds was landed in district 1; 6,971 incidental to the king salmon harvest and 24,262 during the remainder of the season (Table 7). In fishermen's memories the red run appeared larger than in previous years although accurate commercial catch information is available for 1981 and 1982 only. The management staff continued an aggressive species identification program throughout the king and chum salmon season concentrating on the

deliveries made at the major processing plants in Bethel.

District 2 fishermen landed 1,921 red salmon bringing the Kuskokwim River total commercial harvest to 33,154 reds (Table 5). Red salmon weighed an average 7.1 pounds per fish and brought an average \$.46 per pound. Reds continue to comprise approximately 10.5% of the total summer small salmon harvest. Several years of commercial red salmon harvest information is now available. This data together with the Holitna Weir escapement, and Kwegoooyuk test fish catch information may be used in the future to extrapolate the historic commercial red salmon catches in the Kuskokwim River since the percentage of red to chum salmon recorded at each of these sites over recent years has remained surprisingly consistent.

Coho Salmon

The total Kuskokwim River commercial coho harvest of 447,117 fish was the largest on record, more than double the previous 5 year average. Cohos were present in the river approximately 22 days early with the first reported coho salmon commercially harvested on July 8th.

The lower Kuskokwim River was opened for commercial coho fishing on July 29th, the earliest commercial coho opening on record. Commercial fishermen were permitted a total of 60 hours of fishing time, consisting of 10 six hour openings between July 29 and August 31. Peak catches were made in this district on August 12 when 80,685 cohos were landed. A total of 435,357 coho salmon was harvested with a CPUE of 18.5 for the season. The highest CPUE prior to this season was 11.1 recorded in 1980 (Appendix Table 15). Cohos weighed an average 7.1 pounds and brought an average \$.51 per pound (Table 6).

A total of 11,760 coho salmon was harvested by district 2 fishermen during three six hour commercial fishing periods from August 9 through 19. Fishermen were permitted to exceed the harvest guideline of between two and four thousand fish as a result of the unusually large run the Kuskokwim experienced this season. The CPUE for the season in this district was 40 fish, more than double that recorded in district 1 for the 1982 season. Coho weighed and brought a similar price as they did in district 1.

Subsistence Fishery

The annual survey of the Kuskokwim River subsistence fishery was initiated in 1960. During the early years, the Department utilized "smokehouse counts" to determine total utilization of subsistence caught fish. In an effort to determine additional timing and magnitude data, the Department began using "subsistence catch calendars" which are distributed to fishermen prior to the fishing season. Subsistence fishermen enter their daily catches of salmon and non-salmon species on the calendar. During July and August a Department crew utilizes a cabin skiff to travel more than 360 river miles (Eek to Swift River) to collect catch data from the individual fishermen in addition to recording certain information from non-fishing families. After the river survey is completed, catch questionnaires are sent to those fishermen not individually contacted.

In the 1969 Annual Report, a review is presented regarding methods used to obtain subsistence harvest and related information. All subsistence

information is presented in tabular form in this report, except Appendix Table 18 which represents "expanded data". This includes those families known to have fished but who, for one reason or another, were not personally contacted by the survey crew. Catch data for these families are assumed to be the same as the averages for the particular village and are included in most of the tables.

Reported coho salmon catches are very minimal because the coho salmon run occurs after the survey is completed. Most of the coho salmon catch data is obtained from the return of catch calendars. Prior to 1969, little effort was made to determine the coho salmon harvest. The coho salmon estimates are not included in the comparative catch tables.

The Kuskokwim River harvest included 56,556 king salmon, 185,598 chum salmon, and 40,641 coho utilized by an estimated 968 fishing families during 1982 (Table 9). Harvest information for two additional upper Kuskokwim villages is occasionally available and is not included in the Kuskokwim River harvest presented here. This data is available at the bottom of Table 9.

The king salmon harvest was the third largest since 1970 and was 6 percent above the previous five year average of 53,058 (Appendix Table 16).

The "other salmon" harvest was 7% greater than the previous five year average catch (Appendix Table 17). This catch is composed primarily of chum salmon.

The public relations aspect of the annual subsistence fishery survey is important to the success of the survey itself and to the Department's management program. By any method tested, the results of the voluntary contribution of the people to this program are as accurate as the people are capable of giving. The major problem is that many of the fishermen speak only Yupik Eskimo and have to relay much of the catch information through their school age children.

There is still a moderate sale or trading of dried salmon on the Kuskokwim River, but it is not documented. People from the coastal delta villages still bring their pokes of seal oil to trade for dried fish. The lower river dried fish are now primarily being used for human consumption.

The use of the fishwheel to capture salmon is slowly disappearing from the Kuskokwim River. Fourteen fishwheels were used along the survey route in 1982, reflecting a long term increase when compared to 30 in 1965 and 65 in 1960. The fishwheel is being replaced by the more mobile gillnet, which involves a lot less time and effort to operate. The use of gillnets is a relatively new technique for most Kuskokwim River residents. The efficiency of the two types of gear is difficult to evaluate, as large catches are often made with both.

Representatives of the villages in the upper Kuskokwim area, namely Nikolai, Telida, Takotna, Medfra, and McGrath, registered complaints about their salmon fishery with the Board of Fisheries in December of 1978 and 1979. These complaints consisted of a perceived lack of king salmon as well as a decrease in catch success for other available salmonid species. The Board of Fisheries directed the Divisions of Commercial Fisheries and Subsistence to initiate a study in this section to sift through the perceptions, allegations, historical patterns, and biological reality to determine whether this was another example

of the "upriver-downriver" conflict or whether it was a more complex problem.

The Division of Commercial Fisheries increased biological research by attempting to fly additional aerial surveys in order to document the salmon escapement by species in this portion of the Kuskokwim drainage. In addition Commercial Fisheries initiated a weir project at the forks on the Salmon River during the summer of 1981. The objective was to enumerate the king salmon escapement by age and sex in a known spawning stream of the upper Kuskokwim system. These studies were supplemented by the subsistence calendar and household survey program previously discussed in this section.

The Subsistence Division focused its research to include many other factors that may have contributed to the complaints including the availability and harvest of other resources, the job opportunities, observations of village fishing efforts, store surveys, and other historic factors that might have an effect on the salmon harvests in these communities.

After several seasons of research it is felt that the harvests in these communities reflects the fishing effort, river conditions, harvest methods (i.e. fishwheels, weirs, gillnets, and rod and reel) and abundance of salmon by species. Seasonal employment opportunities that occur concurrent to the salmon runs greatly affect the fishing success in these areas. This situation was amplified during the summers of 1981 and 1982 when exceptional seasonal employment opportunities resulted in a corresponding overall decrease of the subsistence salmon harvest in Nikolai. In this village 76% of the total subsistence king salmon harvest was taken by the use of rod and reel, 19% by set net, and the remaining 5% by fishwheel. This data appears to reflect a growing dependence on rod and reel as an important harvest method in this subsistence fishery. In fact during the 1982 season approximately 33% of king salmon population identified in one fork of the Salmon River was harvested by fishermen from nearby villages with rod and reel gear. Past information on harvest methods is spotty but this is an area of interest which greatly affects the fishing success these villages experience each year.

It should be noted that these villages are located near the upper reaches of the Kuskokwim salmon spawning habitat. Large salmon populations similar to those found in middle Kuskokwim systems do not seem to occur in these areas.

Escapement

Kuskokwim River drainage escapement indices from aerial surveys have proven difficult and costly to obtain. Varying stream and weather conditions, in addition to pilot and observer skills, often make the data difficult to compare between index areas and between years (Appendix Table 20). Although aerial surveys will be continued for some streams, emphasis will be placed on obtaining escapement estimates by use of counting towers, sonar and weirs on several key spawning tributaries.

Kuskokwim River aerial indices for 1982 are presented in Table 12. Escapement indices of kings and chums are below recent aerial index averages. Red salmon indices, though lower than the past two years, are still considered good. It should be noted that adverse weather prevented aerial work on most Kuskokwim River streams until August 4, well after the peak of spawning for kings and chums. Some aerial counts (Gagaryah River, Kisaralik River) were also

hampered by high water conditions.

The Ignatti Weir in the headwaters of the Holitna River experienced a late start up date due to early high water; however, an acceptable number of king salmon (10,500), strong numbers of chum salmon (59,000) and red salmon (17,000), and record numbers of coho salmon (35,000) were estimated to have passed upstream of the Weir. Escapement trends documented by sonar techniques for the Aniak River over the three years, 1980-1982, show steadily declining estimated total king and chum salmon escapements. Record estimates for 1980 of over 1 million chum and over 50 thousand king salmon have decreased to slightly more than 375 thousand chum and 33 thousand king salmon in 1982.

The Salmon River (Pitka Fork) king salmon escapements derived from Weir data in 1982 was 754. The aerial index was 419. This is the lowest return recorded since 1975 when the Department's aerial data base on that stream was begun. Salmon River king salmon returns in 1982 are considered weak.

QUINHAGAK (DISTRICT 4)

Commercial Fishery

The Quinhagak fishery is one of two located in Kuskokwim Bay (Figure 1). This fishery has traditionally been very sporadic due to unreliable processing facilities; however, the commercial fishery has stabilized during the past few seasons.

Fishing regulations for this district are very similar to those found on the Kuskokwim River, except that there are no distinct fishing seasons. Beginning with the 1971 season, the basic fishing period was reduced from two 24-hour periods to two 12-hour periods per week. Commercial fishing is allowed only in Kuskokwim Bay waters. This is necessary to ensure escapement of adequate numbers of salmon up the narrow Kanektok River. The vast majority of gear consists of drift gillnets that are fished at low tide in "gutters" located two to five miles offshore and at high tide are fished next to shore. Most of the fishing takes place near the mouth of the Kanektok River.

The Kanektok River king salmon run is later than that of the Kuskokwim River. For this reason the Quinhagak fishery opening is delayed until mid-June. The delayed opening prevents possible interception of Kuskokwim River fish and aids in preventing overharvest of the king salmon run.

Fishermen were required to use small mesh gear (6-inch stretched mesh or smaller) during the entire commercial fishing season. This was necessary primarily to prevent selective harvesting of the larger, more productive king salmon by the large mesh nets. However, the mesh limitation was also designed to increase harvests of the more abundant "other salmon" species (i.e. red, pink, chum and coho).

The Quinhagak district experienced a good season with record catches of red and coho salmon. One hundred seventy-seven fishermen made at least one landing in this district during the 1982 season, somewhat below the previous five year average of 204 fishermen, and well below the record in 1977 of 258 fishermen. A total of 360 hours was open to commercial fishing this season (Table 10).

The king salmon harvest of 22,106 represents the second highest catch, slightly below the record catch of 24,525 taken in 1981 and was well above the previous five year average of 15,496 fish (Appendix Table 5). Kings weighed an average 18.3 pounds and brought an average price of \$.78 per pound (Table 6).

The commercial catch of 25,685 red salmon surpasses the previous record of 19,510 reds landed in 1974, and was substantially above the previous five year average of 12,490. Red salmon weighed an average 7.5 pounds and brought an average of \$.45 per pound.

The chum salmon harvest of 33,336 was below the previous five year average of 42,760 chum. The chum salmon harvest appears to reflect a below average chum run returning to this district, substantiated by aerial survey counts made in late July. Chums brought an average price of \$.22 per pound and weighed an average 7.9 pounds per fish.

A total of 11,838 pink salmon was landed this season. Pinks brought an average \$.05 per pound and weighed an average 3.6 pounds per fish.

The coho salmon commercial catch of 73,651 represents a record harvest well above 37,373 the previous five year average. Coho salmon weighed an average 7.9 pounds and brought an average \$.52 per pound.

The Quinhagak fishermen continued to have difficulties marketing their commercial harvest in 1982. Several commercial fishing periods were not fished or had reduced effort due to bad weather or limited processor capacity. The Quinhagak district experienced 6 commercial fishing periods where processors on the grounds could not handle all the commercial harvest and had to turn away boats with fish aboard. Department personnel estimated an additional 1,500 kings, 1,100 chums, 1,300 reds and 1,900 coho salmon were commercially caught but not sold. Fishermen unable to sell their catch generally utilized the fish for subsistence, however in some cases fish spoiled. Although this district is open for commercial fishing by regulation until September 8, the last commercial deliveries were made on August 30 as a buyer was not available after that date.

Subsistence Fishery

Accurate comparable subsistence data has not always been available for the Quinhagak subsistence fishery in recent years. Methods used to tabulate catches made by Quinhagak fishermen were similar to those used for the Kuskokwim River survey. During the 1982 subsistence survey, 52 Quinhagak fishing families were contacted (Table 9). The subsistence harvest reported by these families was expanded to the estimated 67 fishing families in Quinhagak. The expanded harvest was 2,402 king, 2,186 "other" 1 and 860 coho salmon. The small coho catch is more of a reflection of the survey being conducted before the majority of the subsistence coho salmon were caught.

Appendix Table 19 shows comparative catch data for 1967-1982.

1 Other salmon includes chum, red, pink and some small king salmon.

Escapement

All escapement data presented in this section are from the Kanektok River system.

During the 1982 season a side-scanning salmon counter was employed in the Kanektok River to determine the feasibility of counting salmon by sonar. This was the first full season for the Kanektok River Sonar project, although a two week sonar feasibility study was conducted in late August, 1981. A total of 202,210 electronic fish counts was recorded in 1982, the species composition of this count could not be accurately quantified.

The 1982 king salmon aerial survey count of 8,142 is consistent with the large escapements observed over the past three years and is above the recent 10-year average of 7,467. The 1982 chum salmon aerial survey count (8,820) is considerably below the 1982 chum salmon index count (8,820) is considerably below the 1978-1982 average (83,975) as well as the recent 10-year average (38,879). The red salmon count in 1982 (55,950) is slightly below the 1978-1982 average (65,818), but considerably above the recent 10-year average (31,007). The pink salmon aerial index in 1982 (67,621) was below the recent even-year indices, but still strong by odd-year standards.

GOODNEWS BAY (DISTRICT 5)

Commercial Fishery

Traditionally, the male residents from the villages of Goodnews Bay and Platinum have gone to Bristol Bay each summer to fish or work in the canneries, leaving the women and children home to fish for subsistence purposes. Prior to 1968, there are no records indicating that commercial salmon harvests were ever made in Goodnews Bay. The Department held public meetings in the area during the early 1960's regarding the possibility of initiation of a commercial fishery, but the negative response from village residents plus the absence of salmon buyers precluded this development.

In late August of 1968, the commercial salmon fishing was opened by emergency order in Goodnews Bay. This commercial fishery was created as a result of a request from area residents. Department surveys indicated that a small harvestable supply of salmon was available. The fishery has been sporadic in nature due to inconsistent processing capabilities and inclement weather.

The commercial salmon season was opened June 17 in the Goodnews Bay district with a total of 113,538 salmon landed. This district experienced a strong season with record king and coho catches made (Table 11). Forty-eight fishermen made at least one landing in the Goodnews Bay district, which reflects an increase over the previous five year average of 39 fishermen. A total of 540 hours was opened to commercial fishing this season.

The king salmon harvest of 9,476 fish surpasses the previous record of 7,190 kings landed in 1980 and was well above the previous five year average of 4,184 fish. Average price paid for king salmon was \$.80 per pound by three major processors which operated during some portion of the season (Appendix

Table 5). King salmon weighed an average of 16.3 pounds in the commercial fishery this season.

The commercial catch of 38,877 red salmon taken this season represents the second highest catch of reds made in this district. This season's catch was well above the previous five year average of 19,524 red salmon. Reds weighed an average of 7.2 pounds and brought an average of \$.34 per pound.

The chum salmon harvest of 13,829 portrays the second highest catch on record, well above the previous five year average of 9,962. An average price of \$.16 per pound was paid with chum weighing an average 7.7 pounds.

A total of 4,673 pink salmon was landed this season. Pink salmon weighed an average of 3.8 pounds and brought an average of \$.06 per pound. Pinks are landed incidental to the chum and red salmon fishery as fishermen do not target on them.

The coho harvest of 46,683 represented a record harvest, well above the previous five year average of 26,440. The coho salmon run was stronger than the harvest indicates with bad weather during the month of August hindering both the fishermen and processors. Three commercial fishing periods were missed due to bad weather and no buyers. Coho salmon weighed an average of 8.4 pounds and brought an average of \$.65 per pound.

Escapement

This was the second season that the Goodnews River counting tower, located approximately 12 miles upriver from Goodnews village on the middle fork of the Goodnews River, was operated. The tower counts greatly assisted and improved the in-season management of the Goodnews Bay commercial and subsistence fisheries. The 1982 expanded total count was 1,395 king, 56,255 red, 6,767 chum, 13,855 pink and 62 coho salmon. In comparison the 1981 expanded count was 3,688 king, 49,108 red, 21,827 chum, 1,327 pink and 357 coho salmon.

In addition to the more recent counting tower studies, the Goodnews system escapements have been indexed by aerial methods (Appendix Table 20) since 1959. Aerial escapement indices show a higher (1,990) than normal return of kings in 1982 than any other year since 1977 when the index was a record 2,163. The 1982 index on the Middle Fork was a record 1,546. These numbers, when qualified by commercial catch and recent tower counts, indicate an average return of kings occurred in 1982. The Goodnews Bay commercial king catch was composed of 64.8 percent age 5 fish which were spawned in the 1977 brood year which also showed a strong aerial index.

Goodnews River aerial escapement indices showed strong returns of chum salmon (9,700) in 1982. The Middle Fork index was a record 6,300. According to Goodnews commercial catch statistics, age 5 was the dominant (52.6%) age class. Those fish were from the 1977 brood year which yielded a near record high aerial index (15,993) for the Goodnews River.

The pink salmon return in 1982 was weak for an even-year escapement as measured by aerial indices in the Goodnews River (2,100) and in the Middle Fork Goodnews River (2,325). Goodnews system sockeye salmon returns were strong as indicated by the 1982 Goodnews River (19,960) and the Middle Fork

(2,327) aerial indices.

Statements about the quality of coho spawning escapements can not yet be made because so little data has been obtained on that species. The aerial survey and the tower operations were too early to properly assess the coho salmon escapement.

Based on these observations and comparative catch information, escapement of red salmon appeared excellent in magnitude with record counts. King and chum salmon appeared good.

Subsistence Fishery

Accurate subsistence data has been lacking in the district 5 fishery in recent years. During the 1982 survey a total of 22 fishing families was contacted, harvesting an estimated 1,236 king, 2,754 small salmon, and 2,692 coho salmon (Table 9).

OUTLOOK FOR 1983

King Salmon

The majority of the returning king salmon in 1983 will be five and six years of age. Based on average brood year escapements, the 1983 run would normally be expected to be average in magnitude. However the effects of the Japanese high seas mothership fishery may depress returns to some extent.

Chum Salmon

Chum salmon will return as three, four and five year old fish from the 1980, 1979 and 1978 brood years. The majority of the run will be composed of four year olds which are the progeny of 1979 spawners. Little comparative escapement information is available, however, comparative commercial catch data indicate an average return of chums in 1983.

Coho Salmon

There is little information available to assess coho salmon abundance in 1982. The majority of cohos mature at four years of age with a few maturing at five years. Due to a lack of funding, very few coho salmon escapement surveys can be made. The Department is in the early stages of building a data base on coho escapement after having operated the Holitna weir during the coho run for the second year in 1982.

Relatively high catches and catch per unit effort were attained in this fishery in 1979, 1980, 1981, and particularly 1982, due to large returns and more intense fishing efforts in these years. In 1978 and 1979, the parent years for the 1982 return, the catch per unit effort was average. Due to the changed nature of the fishery since the mid-seventies and the lack of escapement data on this species, a conservative management approach will be taken in 1983.

The comparative catch data indicates that the 1983 return should be average or above average in magnitude.

Pink Salmon

Pink salmon returns during odd years (1977, 1979, 1981, etc.) are normally poor.

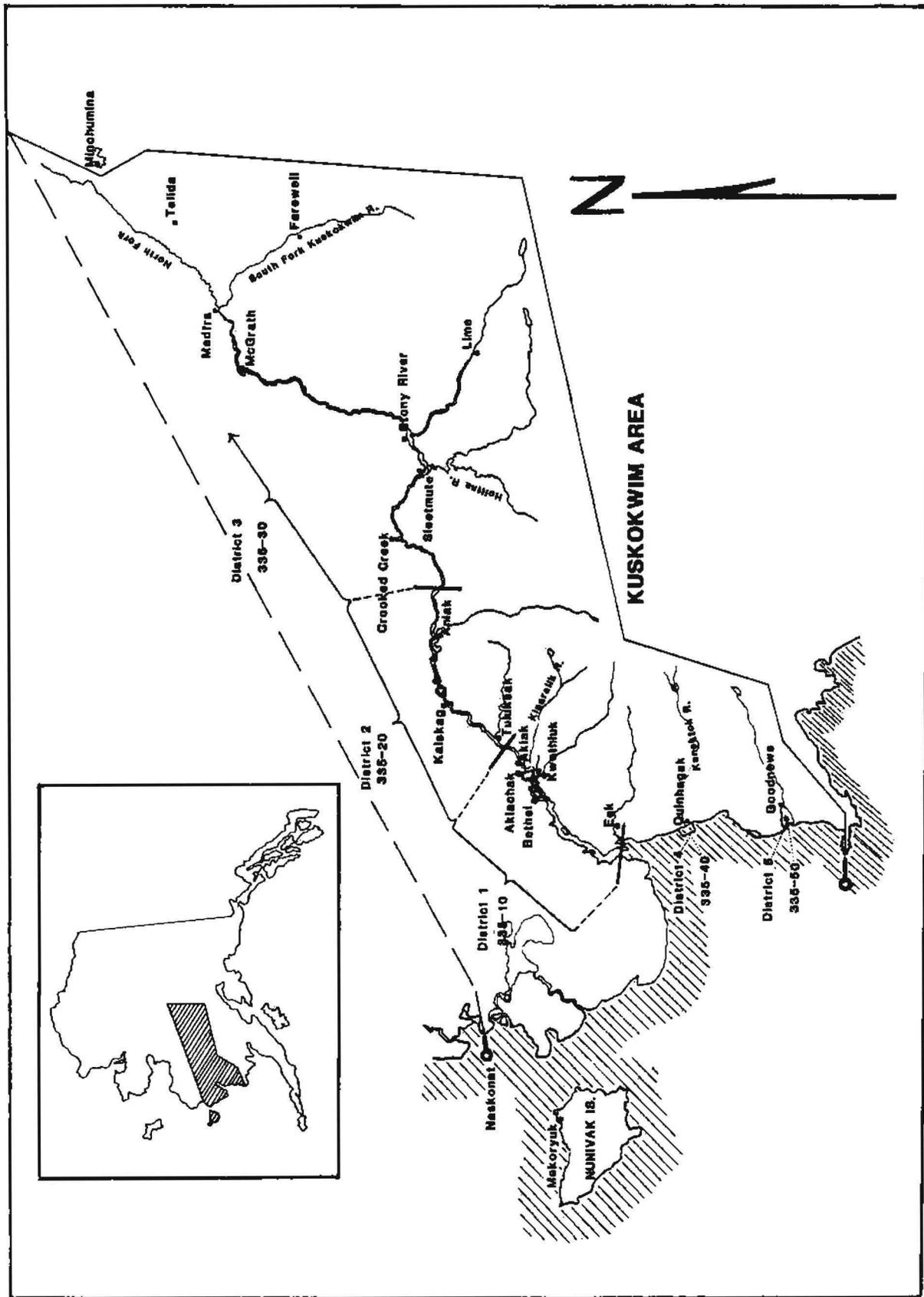


Figure 1. Kuskokwim Area Map.

Table 1. Kuskokwim Area Salmon Fishery Emergency Orders, 1982.

| Emergency No. | Date | Action Taken | Justification |
|---------------|---------|---|---|
| 7 | 11 June | Opened commercial salmon fishing season in District 1 and established the first commercial fishing period from 6:00 pm until midnight June 14, 1982. | King salmon present in sufficient numbers. |
| 8 | 5 June | Opened commercial salmon fishing in Districts 4 and 5 effective June 17, 1982 and established twice weekly fishing periods from 6:00 pm Monday until 6:00 am Tuesday and from 6:00 pm Thursday until 6:00 am Friday. | King salmon present in sufficient numbers. |
| 9 | 17 June | Opened commercial fishing season in District 2 and established a 6 hour commercial fishing period in District 1 and 2 from 6:00 pm until midnight on June 17, 1982. | King salmon present in increasing numbers. |
| 10 | 20 June | Established commercial fishing period in Districts 1 and 2 from 6:00 pm until midnight, June 21, 1982. | King salmon continued to be present in sufficient numbers. |
| 11 | 24 June | Established a commercial fishing period in District 1 from 6:00 pm until 10:00 pm June 24, 1982 and in District 2 from 6:00 pm until midnight, June 24, 1982. | King salmon continued to be present in sufficient numbers. |
| 12 | 28 June | Established three 12 hour periods per week in District 5, effective June 28, 1982 from 6:00 pm Monday until 6:00am Tuesday, from 6:00 pm Wednesday until 6:00 am Thursday, and from 6:00 pm Friday until 6:00 am Saturday. | Chum and red salmon present in sufficient numbers. |
| 13 | 27 June | Established three 4 hour commercial chum fishing periods in District 1 effective June 28, 1982, from 6:00 pm until 10:00 pm Monday, Wednesday, and Friday. Reduced size of commercial fishery to that area from Bethel downriver to the north end of Eek Island. Mandated use of 6 inch or smaller mesh gear. | Chum and red salmon present in sufficient numbers. Regulations prohibit commercial use of over 6" mesh gill-nets after June 25. |

Table 1. (Continued).

| Agency No. | Date | Action Taken | Justification |
|---------------|---------|---|--|
| 14 | 30 June | Continued the commercial fishing season in District 5 and established a 60 hour period from 6:00 pm June 30 until 6:00 am July 3. | Red salmon and chum salmon present in increasing numbers. |
| 15 | 27 June | Waived the subsistence fishing closure 24 hours before the Wednesday commercial fishing period. | Provided for sufficient subsistence fishing time with the additional commercial opening. |
| 16 | 5 July | Continued the chum salmon fishing season and reestablished two six hour commercial fishing periods in District 1 effective July 5, 1982, from 6:00 pm until midnight on Mondays and Thursdays. | Three four hour periods per week did not result in an increased commercial harvest. |
| 17 | 2 July | Established two six hour commercial chum salmon fishing periods in District 2, from 6:00 pm until midnight both on July 2, 1982 and on July 5, 1982. | Chum salmon present in sufficient numbers. |
| 18 | 5 July | Continued the fishing season and established three 24 hour periods a week in District 5, from 6:00 pm Monday until 6:00 pm Tuesday, from 6:00 pm Wednesday until 6:00 pm Thursday, and from 6:00 pm Friday until 6:00 pm Saturday. | Red salmon and chum salmon present in sufficient numbers. |
| 19 | 5 July | Continued the fishing season and increased commercial fishing time in District 4 from two 12 hour periods per week to three 12 hour periods per week, from 6:00 pm Monday until 6:00 am Tuesday, from 6:00 pm Wednesday until 6:00 am Thursday, and from 6:00 pm Friday until 6:00 am Saturday. | Red and chum salmon present in sufficient numbers. |

Table 1. Kuskokwim Area Salmon Fishery Emergency Orders, 1982.

| Agency Order No. | Date | Action Taken | Justification |
|------------------|---------|--|---|
| 20 | 13 July | Closed the commercial chum salmon fishing season in District 1 of the Kuskokwim River (Bethel to north end of Eek Island) effective July 13, 1982 until further notice. | Declining test fish catches, declining commercial catches, and declining catch per unit effort indicate that the majority of the chum salmon run has passed through the lower river. |
| 21 | 17 July | Decreased commercial fishing time from three 24 hour periods to three 12 hour periods a week in District 5. Effective 6:00 pm July 21, 1982, fishing periods are from 6:00 pm Monday until 6:00 am Tuesday, 6:00 pm Wednesday until 6:00 am Thursday, and 6:00 pm Friday until 6:00 am Saturday. | Declining commercial catches, and declining counts past the Department tower on the Goodnews River indicate that the majority of king, red, and chum salmon have passed through the commercial fishery. |
| 22 | 28 July | Continued the commercial fishing season in Districts 4 and 5 changed the commercial fishing schedule from nighttime to daytime openings. Effective 6:00 am August 2, 1982, commercial openings are from 6:00 am until 6:00 pm on Mondays, Wednesdays, and Fridays. | Daylight fishing hours during August facilitate fishermen safety. |
| 23 | 28 July | Opened commercial coho salmon season in District 1 of the Kuskokwim River (Mishevik Slough to north end of Eek Island) and established two six hour commercial fishing periods per week. Effective July 29, 1982, commercial fishing periods will be from 9:00 am until 3:00 pm Mondays and from 9:00 am until 3:00 pm Thursdays until further notice. | A majority of king and chum salmon have passed through District 1. Reported subsistence catches indicate that coho salmon are present in the District and have been present for 22 days. |
| 24 | 27 July | Established the subsistence fishing closure in District 1 15 hours before, during, and 6 hours after each commercial fishing period effective 6:00 pm July 28. | Permits adequate subsistence fishing time with the daytime commercial fishing schedule. |

Table 1. (Continued).

| Agency Order No. | Date | Action Taken | Justification |
|---------------------|-----------|---|--|
| 25 | 4 August | Opened commercial coho salmon fishery in District 2 of the Kuskokwim River and established the first commercial coho fishing period in that district from 9:00 am until 3:00 pm Monday, August 9, 1982. | Commercial catches in District 1 and the presence of coho salmon at Ignatti weir on the Holitna River indicate that coho salmon are present in District 2 in sufficient numbers. |
| 26 | 16 August | Established a second commercial coho period in District 2, from 9:00 am until 3:00 pm Monday August 16, 1982. | Coho salmon continue to be present in sufficient numbers. |
| 27 | 17 August | Established an additional commercial coho period in District 2, from 9:00 am until 3:00 pm Thursday August 19, 1982. | Commercial harvests and escapement figures indicate that a harvestable surplus of coho salmon continue to be present in District 2. |

Table 2. Kuskokwim Area Salmon Project Summaries, 1982.

1. Kuskokwim River Test Fishing.

- a. Location: Kwegooyuk on the east bank of the mouth of the Kuskokwim River located 56 river miles downstream from Bethel.
- b. Objectives: Determine run timing and relative abundance of king, red and chum salmon.
- c. Results: The 1982 project captured 542 kings, 504 chums and 385 reds, totaling 1,431 salmon between June 8 and July 15. The king and chum catch was average in magnitude. Red catches were high and appeared consistent with the run magnitude revealed by the commercial catch.

3rd lowest
on record

2. Ignatti Weir.

- a. Location: Upper Holitna River, about 1.5 miles below the Kogrukluuk River.
- b. Objectives: Enumerate salmon escapement by species, sex and age.
- c. Results: The weir was operational from July 7 to September 14, 1982. By July 31, the end of the king and chum data period, 5,157 king, 42,288 chum, 13,779 red, and 17 pink salmon were counted. The late start on July 7 allowed 50 percent of the king, 40 percent of the chum and 25 percent of the red salmon to go uncounted prior to operations. Data analysis resulted in estimated total escapements of 10,500 king, 59,000 chum, and 17,000 red salmon. A record 34,000 coho salmon were counted.

3. Aniak Sonar.

- a. Location: 12 miles upstream on the Aniak River.
- b. Objectives: 1) Estimate total escapement of king and chum salmon in the Aniak River using the side scan sonar, and 2) determine species, sex and age composition of the escapement using drift gillnets.
- c. Results: The sonar was operated from June 21 to August 1, 1982. Total counts were 23,349 king and 236,086 chum salmon. The total escapement estimate (subject to later revision) is 35,024 king and 354,129 chum salmon.

The gillnet testing revealed a significant number of pink salmon. The nets yielded 61 king, 649 chum, 1 sockeye, and 20 pink salmon. The test net operation resulted in approximately 14 hours of gillnet soak time.

4. Commercial Salmon Catch Sampling.

- a. Location: Bethel, Quinhagak and Goodnews Bay.
 - b. Objectives: Obtain age, sex and size information for commercially caught fish.
 - c. Results: Samples of all species were sampled, analyzed and presented in separate reports.
5. Aerial Surveys.
- a. Location: Kuskokwim River drainage (and Kuskokwim Bay).
 - b. Objectives: Determine if spawning escapements for king and chum salmon are adequate.
 - c. Results:
6. Salmon River Weir.
- a. Location: 200 yards upstream from the mouth of the south tributary of the first fork of the Salmon River, a tributary of the Pitka Fork, east of McGrath.
 - b. Objectives: 1) Estimate king salmon escapement in the Salmon River, and 2) establish a relationship between aerial survey counts and estimated Salmon River king salmon escapement.
 - c. Results: The weir operated from July 6 to July 30, 1982. During that time, 511 king and 35 chum salmon were counted. An aerial survey on July 26 revealed that 70 percent of the total escapement was past the weir. Therefore, the total estimate was 730 kings.

The 1982 counts and aerial surveys indicate that the king escapement is below the recent averages; however, similar low escapements occurred in the mid-70's with no short term adverse effects on spawner returns.

Should the combination of commercial subsistence and sport fishing coincide in any given year with low spawner returns, there is a danger that this relatively small stock would suffer, at least, short term and perhaps long term suppression. In 1981 the king escapement was 2,153. About 300 kings were taken from the Salmon River by subsistence and sport fishermen. In 1982, however, with an escapement of only 730, approximately 450 kings were taken from the river by fishermen. The nature of the subsistence and sport fisheries on this stock could conceivably enable fifty percent or better exploitation rate of returns past the lower Kuskokwim fisheries when they number 1,000 or fewer kings. The danger of over exploitation increases dramatically as the number of spawners returning to the mouth of the Salmon River drops below 1,000 fish.

1982 was determined to be the last year of operation for this

project. The project was successful in meeting its objectives.

7. Goodnews River Tower.

- a. Location: 12 miles upriver on the south side of the middle fork of the Goodnews River near the base of Lookout Mountain.
- b. Objective: Enumerate salmon escapement by species, determine run timing and relative abundance of king, red, pink, and chum salmon in a portion of the Goodnews River system.
- c. Results: The tower was operational from June 23 through August 3. The project was hindered by high water, turbidity, and inclement weather which limited counting conditions. Eighteen hour a day censuses were attempted, with two twenty-four hour counts made during July. The actual counts were expanded by establishing the average hourly migration past the tower and interpolating these counts for a twenty-four hour day. Expanded totals for the season were 1,395 kings, 21,827 chums, 56,255 reds, 13,855 pinks, and 62 cohos. Tower counts assisted and improved in-season management of the Goodnews Bay fishery.

8. Kanektok River Side Scanning Sonar.

- a. Location: Approximately eight miles upriver from the village of Quinhagak on the south bank of the Kanektok River.
- b. Objectives: Continue study of the feasibility of using side scan sonar as an in-season salmon management tool on the lower Kanektok River.
- c. Results: The sonar was operational from June 20 through August 2 with a total of 202,210 salmon counted. Species composition (derived from commercial catch figures) was determined to be 26,592 kings, 37,350 reds, 13,610 cohos, 58,442 chums and 66,126 pinks. Problems encountered during the operation included mechanical failure of some of the sonar equipment, high water and debris counts.

9. Aerial Escapement Surveys.

- a. Location: Kuskokwim River and Kuskokwim Bay drainages.
- b. Objectives: Determine if spawning escapements for king and chum salmon are adequate.
- c. Results: Seven systems were surveyed for results refer to Table 12.

Table 3. Kuskokwim Area Salmon Processors and Associated Data, 1982.

| Commercial Operator | Product | District |
|--|---------------|----------|
| Ball Bros., Inc. 4041 International Airport Rd. Suite 2 Anchorage, AK 99502 | Fresh salmon | 5 |
| Bristol Bay Coastal Fisheries, Inc. P.O. Box 81 Dillingham, AK 99576 | Fresh salmon | 5 |
| Chet Clark Fish Products Ltd. Box 19 Aniak, AK 99557 | Fresh salmon | 2 |
| J.B. Crow & Sons PO Box 567 Bethel, AK 99559 | Fresh salmon | 1, 2, 4 |
| E & J Fisheries c/o John Seager Platinum, AK 99651 | Fresh salmon | 5 |
| Jerry & Susan Huey, Fishmongers (Seafoods by Craig) Platinum, AK 99651 | Fresh Salmon | 5 |
| Kachemak Seafoods, Inc. P.O. Box 129 Togiak, AK 99678 | Fresh salmon | 5 |
| Kemp & Paulucci Seafoods 4832 West Superior St. Box 6506 Duluth, Minnesota | Frozen salmon | 1, 2, 4 |
| Patson Fisheries Box 445 Bethel, AK 99559 | Fresh salmon | 1, 4, 5 |
| Schenk Seafood Sales, Inc. P.O. Box 984 Bellingham, WA 98227 | Frozen salmon | 5 |
| Sea Fisher Products, Inc. P.O. Box 8 Petersburg, AK 99833 | Frozen salmon | 5 |

Table 3. (Continued)

| Commercial Operator | Product | District |
|--|------------------------------|----------|
| Swansons P.O. Box 478 Bethel, AK 99559 | Frozen salmon & Whitefish | 1 |
| Swiftsure Fisheries Box 4-2207 Anchorage, AK 99509 | Fresh salmon | 5 |
| Togiak Fisheries General Delivery Togiak, AK 99678 | Fresh salmon | 5 |
| Y-K Fisheries (Formerly K & A Fisheries) Box 78 Aniak, AK 99557 | Fresh salmon | 1, 2 |

Table 4. Kuskokwim area salmon entry permits issued by village, 1982.

| Village | Number of Entry Permits |
|----------------------|-------------------------|
| Akiachak | 45 |
| Akiak | 27 |
| Aniak | 9 |
| Atmauthluak | 27 |
| Bethel | 154 |
| Chauthbaluk | 2 |
| Chefornak | 3 |
| Eek | 40 |
| Goodnews Bay | 34 |
| Kalskag | 5 |
| Kasigluk | 42 |
| Kipnuk | 14 |
| Kongiganak | 28 |
| Kwethluk | 69 |
| Kwigillingok | 12 |
| Lower Kalskag | 3 |
| McGrath | 1 |
| Napakiak | 39 |
| Napaskiak | 27 |
| Nunapitchuk | 42 |
| Oscarville | 7 |
| Platinum | 7 |
| Quinhagak | 86 |
| Tuluksak | 26 |
| Tuntutuliak | 48 |
| Anchorage | 7 |
| Manokatak | 1 |
| Trappers Creek | 1 |
| Nome | 1 |
| Portland Or. | 1 |
| Hooper Bay | 1 |
| Fortuna Lodge | 1 |
| Total Permits Issued | 810 |

Table 5. Kuskokwim area commercial and subsistence salmon catches by species and statistical area, 1982.

| Districts | King | Red | Coho | Pink | Chum 1/ | Total |
|--------------------------|---------|--------|---------|--------|---------|-----------|
| 335-10 Lower Kuskokwim | | | | | | |
| Commercial | 45,449 | 31,233 | 435,357 | 1,741 | 259,254 | 773,034 |
| Subsistence 2/ | 45,639 | - | 29,721 | - | 127,845 | 203,205 |
| Total | 91,088 | 31,233 | 465,078 | 1,741 | 387,099 | 976,239 |
| 335-20 Middle Kuskokwim | | | | | | |
| Commercial | 2,785 | 1,921 | 11,760 | 7 | 19,052 | 35,525 |
| Subsistence 2/ | 9,339 | - | 5,079 | - | 39,225 | 53,643 |
| Total | 12,124 | 1,921 | 16,839 | 7 | 58,277 | 89,168 |
| 335-30 Upper Kuskokwim | | | | | | |
| Commercial | 0 | 0 | 0 | 0 | 0 | 0 |
| Subsistence 2/3/ | 2,725 | - | 6,819 | - | 22,966 | 32,510 |
| Total | 2,725 | 0 | 6,819 | 0 | 22,966 | 32,510 |
| Subtotal Kuskokwim River | | | | | | |
| Commercial | 48,234 | 33,154 | 447,117 | 1,748 | 278,306 | 808,559 |
| Subsistence 2/ | 57,703 | - | 41,619 | - | 190,036 | 289,358 |
| | 105,937 | 33,154 | 488,736 | 1,748 | 468,342 | 1,097,917 |
| 335-40 Quinhagak | | | | | | |
| Commercial | 22,106 | 25,685 | 73,651 | 11,838 | 33,336 | 166,616 |
| Subsistence 2/ | 2,402 | - | 860 | - | 2,186 | 5,448 |
| Total | 24,508 | 25,685 | 74,511 | 11,838 | 35,522 | 172,064 |
| 335-50 Goodnews Bay | | | | | | |
| Commercial | 9,476 | 38,877 | 46,683 | 4,673 | 13,829 | 113,538 |
| Subsistence 2/ | 1,236 | - | 2,692 | - | 2,754 | 6,682 |
| Total | 10,712 | 38,877 | 49,375 | 4,673 | 16,583 | 120,220 |
| Total Kuskokwim Area | | | | | | |
| Commercial | 79,816 | 97,716 | 567,451 | 18,259 | 325,471 | 1,088,713 |
| Subsistence 2/ 4/ | 61,432 | - | 45,181 | - | 195,716 | 302,239 |
| Total | 141,158 | 97,716 | 612,632 | 18,259 | 521,187 | 1,390,952 |

1/ Subsistence catches contain small numbers of red and pink salmon.

2/ Expanded data.

3/ Includes data from the villages of McGrath and Nicholai.

4/ Includes data from the village of Mekoryuk.

Table 6. Average weight and average price per pound of salmon taken in the Kuskokwim area commercial fishery, 1982. 1/

| Subdistrict | Stat. Area | Average Weights by Species 2/ (Average Price/Pound) | | | | |
|------------------|------------|---|-----------|-----------|-----------|-----------|
| | | King | Red | Coho | Pink | Chum |
| Kuskokwim River: | 335-10 | | | | | |
| | 335-20 | 21.5 (.82) 3/ | 7.1 (.46) | 7.1 (.51) | 3.6 (.05) | 7.2 (.22) |
| Quinhagak: | 335-40 | 18.3 (.78) | 7.5 (.45) | 7.9 (.52) | 3.6 (.05) | 7.9 (.22) |
| Goodnews Bay: | 335-50 | 16.3 (.80) | 7.2 (.34) | 8.4 (.65) | 3.8 (.06) | 7.7 (.16) |

1/ Data obtained from processor weights, randomly sampled.

2/ Pounds.

3/ Data taken from king season only, 8-1/2" mesh size.

Table 7. Commercial salmon catch data, lower Kuskokwim River (District 1, Stat. Area 335-10), all gear combined, 1982.

| Period Code | Date of Landing | Hours Open to Fishing | Fisher- men | Fishermen Hours | Catch | | | | | Catch/Fishermen Hour | | | |
|-----------------|-----------------|-----------------------|-------------|-----------------|--------|--------|---------|-------|---------|----------------------|------|-------|-------|
| | | | | | King | Red | Coho | Pink | Chum | King | Red | Coho | Chum |
| 1 | 6/14 | 6 | 464 | 2,784 | 4,912 | 321 | | | 2,532 | 1.76 | 0.12 | | 0.91 |
| 2 | 6/17 | 6 | 496 | 2,892 | 11,285 | 1,061 | | 6 | 4,694 | 3.79 | 0.36 | | 1.58 |
| 3 | 6/21 | 6 | 499 | 2,994 | 13,343 | 2,432 | | 15 | 10,003 | 4.5 | 0.82 | | 3.34 |
| 4 | 6/24 | 4 | 459 | 1,836 | 8,548 | 3,157 | | 1 | 12,908 | 4.66 | 1.7 | | 7.03 |
| Sub-total 1/ 22 | | | 610 | 10,506 | 38,088 | 6,971 | | 22 | 30,137 | 3.63 | 0.66 | | 2.87 |
| 5 | 6/28 | 4 | 352 | 1,408 | 1,943 | 9,938 | | 20 | 58,528 | 1.38 | 7.06 | | 41.57 |
| 6 | 6/30 | 4 | 483 | 1,932 | 2,064 | 5,824 | | 19 | 47,773 | 1.07 | 3.02 | | 24.7 |
| 7 | 7/2 | 4 | 434 | 1,736 | 1,095 | 3,110 | | 38 | 38,918 | 0.63 | 1.79 | | 22.42 |
| 8 | 7/5 | 6 | 372 | 2,232 | 875 | 2,769 | | 88 | 29,315 | 0.39 | 1.24 | | 13.13 |
| 9 | 7/8 | 6 | 435 | 2,610 | 748 | 1,786 | 2 | 221 | 28,942 | 0.29 | 0.68 | | 11.09 |
| 10 | 7/12 | 6 | 354 | 2,124 | 307 | 638 | 23 | 472 | 20,709 | 0.14 | 0.30 | 0.01 | 9.75 |
| Sub-total 2/ 30 | | | 576 | 12,042 | 7,032 | 24,065 | 25 | 858 | 224,185 | 0.58 | 2.0 | 0.0 | 18.6 |
| 11 | 7/29 | 6 | 416 | 2,496 | 114 | 48 | 19,561 | 377 | 2,599 | 0.05 | 0.02 | 7.83 | 1.04 |
| 12 | 8/2 | 6 | 388 | 2,328 | 67 | 69 | 31,944 | 156 | 949 | 0.03 | 0.03 | 13.72 | 0.41 |
| 13 | 8/5 | 6 | 445 | 2,670 | 47 | 26 | 35,766 | 180 | 624 | 0.02 | 0.01 | 13.4 | 0.23 |
| 14 | 8/9 | 6 | 442 | 2,652 | 29 | 25 | 61,231 | 73 | 342 | 0.01 | 0.01 | 23.09 | 0.13 |
| 15 | 8/12 | 6 | 449 | 2,694 | 26 | 6 | 80,685 | 34 | 189 | 0.01 | 0.0 | 29.95 | 0.07 |
| 16 | 8/16 | 6 | 420 | 2,520 | 15 | 5 | 77,785 | 8 | 96 | 0.01 | 0.0 | 30.87 | 6.2 |
| 17 | 8/19 | 6 | 403 | 2,418 | 12 | 12 | 49,566 | 10 | 69 | 0.0 | 0.0 | 20.50 | 0.03 |
| 18 | 8/23 | 6 | 349 | 2,094 | 3 | 5 | 25,218 | 13 | 28 | 0.0 | 0.0 | 12.04 | 0.01 |
| 19 | 8/26 | 6 | 314 | 1,884 | 9 | 0 | 26,761 | 3 | 18 | 0.0 | 0.0 | 14.2 | 0.01 |
| 20 | 8/30 | 6 | 302 | 1,812 | 7 | 1 | 26,815 | 7 | 18 | 0.0 | 0.0 | 14.8 | 0.01 |
| Sub-total 3/ 60 | | | 596 | 23,568 | 329 | 197 | 435,332 | 861 | 4,932 | 0.01 | 0.01 | 18.5 | 0.21 |
| GRAND TOTAL | | 112 | 686 | 46,108 | 45,449 | 31,223 | 435,357 | 1,741 | 259,254 | 0.99 | 0.68 | 9.4 | 5.6 |

1/ King season 6/14 - 6/24
 2/ Chum season 6/28 - 7/12
 3/ Coho season 7/29 - 8/30

Table 8. Commercial salmon catch data, Middle Kuskokwim River (District 2, 335-20), all gear combined, 1982.

| Period Code | Date of Landing | Hours Open to Fishing | Fisher- men | Fishermen Hours | Catch | | | | | Catch/Fisherman Hour | | | |
|-------------|-----------------|-----------------------|-------------|-----------------|-------|--------|--------|------|--------|----------------------|-----|------|------|
| | | | | | King | Red | Coho | Pink | Chum | King | Red | Coho | Chum |
| 1 | 6/17 Period | 6 | 10 | 60 | 222 | 19 | | | 274 | 3.7 | 0.3 | | 4.6 |
| 2 | 6/21 Period | 6 | 23 | 138 | 769 | 53 | | | 817 | 5.6 | 0.4 | | 5.9 |
| 3 | 6/24 Period | 6 | 35 | 210 | 1,122 | 434 | | | 1,912 | 5.3 | 1.9 | | 8.6 |
| Subtotal 1/ | | 18 | 38 | 408 | 2,113 | 506 | | | 3,003 | 5.2 | 1.2 | | 7.1 |
| 4 | 7/2 Period | 6 | 24 | 144 | 271 | 607 | | | 7,060 | 1.9 | 4.2 | | 49.0 |
| 5 | 7/5 Period | 6 | 47 | 282 | 398 | 808 | 7 | | 8,811 | 1.4 | 2.9 | | 31.2 |
| Subtotal 2/ | | 12 | 50 | 426 | 669 | 1,415 | 7 | | 15,871 | 1.6 | 3.3 | | 37.3 |
| 6 | 8/9 Period | 6 | 15 | 90 | 2 | 1,841 | | | 144 | 0.0 | | 20.0 | 1.6 |
| 7 | 8/16 Period | 6 | 13 | 78 | | 4,567 | | | 29 | | | 58.6 | 0.4 |
| 8 | 8/19 Period | 6 | 21 | 126 | 1 | 5,352 | | | 5 | | | 42.5 | 0.0 |
| Subtotal 3/ | | 18 | 25 | 294 | 3 | 11,760 | | | 178 | 0.0 | | 40.0 | 0.6 |
| Grand Total | | 48 | 60 | 1,128 | 2,785 | 1,921 | 11,760 | 7 | 19,052 | 2.5 | 1.7 | 10.4 | 16.8 |

1/ King season 6/17 - 6/24
 2/ Chum season 7/2 - 7/5
 3/ Coho season 8/9 - 8/19

Table 9. Kuskokwim area subsistence fishery summary, 1981.

| Village | Families Surveyed | | | Total Estd. # of Fishing Families | King Salmon | Other 1/ Salmon | Coho Salmon | Fish Wheels |
|----------------------------------|-------------------|--------|------|---|----------------|--------------------|----------------|----------------|
| | Number | People | Dogs | | | | | |
| Kipnuk | 1 | 8 | 10 | 2 | 60 | 280 | 0 | 0 |
| Kongiganak | | | | 1 | 52 | 206 | 48 | 0 |
| Eek | 29 | 144 | 79 | 41 | 2,578 | 1,012 | 328 | 0 |
| Tuntutuliak | 22 | 177 | 102 | 34 | 1,984 | 8,500 | 374 | 0 |
| Kasigluk | 40 | 261 | 266 | 56 | 3,115 | 6,876 | 3,104 | 0 |
| Nunapitchuk | 40 | 321 | 160 | 53 | 2,577 | 8,646 | 417 | 0 |
| Atnautluak | 31 | 198 | 172 | 36 | 1,752 | 4,787 | 216 | 0 |
| Napakiak | 31 | 186 | 156 | 50 | 3,500 | 8,618 | 1,179 | 0 |
| Oscarville | 9 | 45 | 27 | 9 | 523 | 1,665 | 0 | 0 |
| Napaskiak | 27 | 187 | 98 | 33 | 2,872 | 10,139 | 748 | 0 |
| Bethel | 141 | 904 | 589 | 279 | 13,156 | 37,857 | 12,853 | 0 |
| Kwethluk | 57 | 402 | 318 | 79 | 5,897 | 16,837 | 4,657 | 0 |
| Akiachuk | 38 | 284 | 243 | 57 | 4,468 | 13,083 | 4,536 | 0 |
| Akiak | 28 | 158 | 264 | 33 | 2,745 | 9,339 | 1,261 | 0 |
| Lower Kuskokwim River sub-total | | | | 763 | 45,639 | 127,845 | 29,721 | 0 |
| Tuluksak | 24 | 159 | 144 | 40 | 2,220 | 5,040 | 1,860 | 0 |
| Lower Kalskag | 24 | 155 | 105 | 30 | 2,594 | 6,925 | 383 | 0 |
| Upper Kalskag | 14 | 78 | 92 | 16 | 963 | 5,362 | 832 | 0 |
| Aniak | 45 | 186 | 341 | 45 | 2,071 | 14,946 | 1,738 | 5 |
| Chuathbaluk | 15 | 77 | 87 | 16 | 1,491 | 6,952 | 266 | 2 |
| Middle Kuskokwim River sub-total | | | | 147 | 9,339 | 39,225 | 5,079 | 7 |
| Napanute | 3 | 20 | 11 | 3 | 138 | 2,392 | 178 | 1 |
| Crooked Creek | 14 | 65 | 96 | 16 | 515 | 3,622 | 356 | 1 |
| Red Devil | 8 | 39 | 97 | 9 | 273 | 7,380 | 2,444 | 1 |
| Sleetmute | 14 | 56 | 63 | 21 | 242 | 2,936 | 2,583 | 0 |
| Stony River | 9 | 55 | 56 | 9 | 419 | 2,198 | 280 | 4 |
| Upper Kuskowim River sub-total | | | | 58 | 1,587 | 18,528 | 5,841 | 7 |
| Kuskokwim River sub-total | | | | 968 | 56,565 | 185,598 | 40,641 | 14 |
| Platinum 2/ | 5 | 24 | 4 | 9 | 51 | 544 | 174 | 0 |
| Goodnews Bay | 17 | 91 | 37 | 39 | 1,185 | 2,210 | 2,518 | 0 |
| Quinhagak | 52 | 270 | 161 | 67 | 2,402 | 2,186 | 860 | 0 |
| Kuskokwim Bay sub-total | | | | 115 | 3,638 | 4,940 | 3,552 | 0 |
| McGrath 1/ | 7 | 32 | 94 | 8 | 160 | 53 | 0 | 0 |
| Nikolai 1/ | 24 | 96 | 140 | | 978 | 4,385 | 978 | 1 |
| Mekoryuk | 1 | | | | 1 | 740 | 10 | 0 |
| KUSKOKWIM AREA TOTAL | | | | 1,091 | 61,342 | 195,716 | 45,181 | 15 |

1/ Partial data only for these villages.

2/ Includes chum, red, pink, and few "jack" king salmon.

Table 10. Commercial salmon catch data Quinhagak (District 4, Area 334-40), all gear combined 1982.

| Period Code | Date of Landing | Hours Open to Fishing | Fishermen | Fishermen Hours | Catch | | | | | Catch/Fisherman Hour | | | |
|-------------|-----------------|-----------------------|-----------|-----------------|-------|-------|-------|-------|-------|----------------------|------|------|------|
| | | | | | King | Red | Coho | Pink | Chum | King | Coho | Red | Chum |
| 1 | 6/17 | 6 | 72 | 864 | 3,527 | 1,119 | | | 1,556 | 4.10 | 1.3 | 1.8 | |
| 2 | 6/18 6/21 | 12 6 | 70 | 840 | 4,268 | 2,141 | | | 2,278 | 5.08 | 2.55 | 2.71 | |
| 3 | 6/22 6/24 | 12 6 | 83 | 996 | 5,406 | 1,595 | | | 1,403 | 5.43 | 1.60 | 1.41 | |
| 4 | 6/25 6/28 | 12 6 | 58 | 696 | 1,438 | 1,908 | | 3 | 2,458 | 2.07 | 2.74 | 3.53 | |
| 5 | 6/29 7/2 | 12 6 | 52 | 624 | 1,204 | 2,177 | | | 1,972 | 1.93 | 3.49 | 3.16 | |
| 6 | 7/3 7/5 | 12 6 | 50 | 600 | 913 | 2,934 | | | 1,820 | 1.52 | 4.89 | 3.03 | |
| 7 | 7/6 7/7 | 12 6 | 107 | 1,284 | 1,566 | 4,118 | | 826 | 4,016 | 1.22 | 3.17 | 3.09 | |
| 8 | 7/8 7/9 | 12 6 | 97 | 1,164 | 890 | 3,048 | | 761 | 3,830 | 0.76 | 2.62 | 3.29 | |
| 9 | 7/10 7/12 | 12 6 | 73 | 876 | 687 | 1,601 | 2 | 1,207 | 3,742 | 0.78 | 1.83 | 4.27 | |
| 10 | 7/14 7/15 | 12 6 | 66 | 792 | 680 | 1,426 | 2 | 755 | 2,084 | 0.86 | 1.80 | 2.63 | |
| 11 | 7/16 7/17 | 12 6 | 63 | 756 | 533 | 1,293 | 13 | 304 | 2,193 | 0.71 | 0.02 | 1.71 | 2.90 |
| 12 | 7/19 7/20 | 12 6 | 83 | 996 | 390 | 866 | 88 | 1,867 | 2,339 | 0.39 | 0.09 | 0.87 | 2.35 |
| 13 | 7/21 7/22 | 12 6 | 74 | 888 | 203 | 722 | 366 | 1,824 | 1,827 | 0.23 | 0.41 | 2.06 | 1.88 |
| 14 | 7/23 7/24 | 12 6 | 57 | 684 | 88 | 328 | 375 | 1,533 | 1,791 | 0.13 | 0.55 | 0.48 | 1.16 |
| 15 | 7/26 7/27 | 12 6 | | Storm | | | | | | | | | |
| 16 | 7/28 7/29 | 12 6 | 48 | 576 | 56 | 102 | 1,214 | 685 | 333 | 0.10 | 2.11 | 0.18 | 0.58 |
| 17 | 7/30 7/31 | 12 6 | 50 | 624 | 104 | 112 | 2,563 | 593 | 232 | 0.17 | 4.11 | 0.18 | 0.37 |

Table 10. (Continued)

| Period Code | Date of Landing | Hours Open to Fishing | Fishermen | | Catch | | | | | Catch/Fisherman Hour | | | | |
|-------------|-----------------|-----------------------|-----------|-------|--------|--------|----------|--------|--------|----------------------|-------|------|------|------|
| | | | Fishermen | Hours | King | Red | Coho | Pink | Chum | King | Coho | Red | Chum | |
| 18 | 8/2 | 12 | 71 | 852 | 53 | 38 | 2,806 | 628 | 153 | 0.06 | 3.29 | 0.04 | 0.18 | |
| | Period | 12 | | | | | | | | | | | | |
| 19 | 8/5 | 12 | 85 | 1,020 | 27 | 69 | 2,987 | 401 | 134 | 0.03 | 2.93 | 0.07 | 0.13 | |
| | Period | 12 | | | | | | | | | | | | |
| 20 | 8/6 | 12 | 71 | 852 | 26 | 39 | 4,199 | 218 | 112 | 0.03 | 4.93 | 0.05 | 0.13 | |
| | Period | 12 | | | | | | | | | | | | |
| 21 | 8/9 | 12 | 64 | 768 | 6 | 6 | 5,676 | 68 | 11 | 0.01 | 7.39 | 0.01 | 0.01 | |
| | Period | 12 | | | | | | | | | | | | |
| 22 | 8/11 | 12 | 91 | 1,092 | 15 | 25 | 10,076 | 103 | 37 | 0.01 | 9.23 | 0.02 | 0.03 | |
| | Period | 12 | | | | | | | | | | | | |
| 23 | 8/13 | 12 | 21 | 252 | 0 | 0 | 1,561 | 4 | 2 | 0.0 | 6.19 | 0.0 | 0.01 | |
| | Period | 12 | | | | | | | | | | | | |
| 24 | 8/16 | 12 | 5 | 60 | 1 | 0 | 1,403 | 2 | 2 | 0.02 | 23.8 | 0.0 | 0.03 | |
| | Period | 12 | | | | | | | | | | | | |
| 25 | 8/18 | 12 | 84 | 1,008 | 9 | 6 | 9,776 | 21 | 9 | 0.01 | 9.70 | 0.01 | 0.01 | |
| | Period | 12 | | | | | | | | | | | | |
| 26 | 8/20 | 12 | 69 | 828 | 6 | 9 | 3,958 | 19 | 3 | 0.01 | 4.78 | 0.01 | 0.0 | |
| | Period | 12 | | | | | | | | | | | | |
| 27 | 8/23 | 12 | 47 | 564 | 1 | 2 | 5,873 | 2 | 3 | 0.0 | 10.41 | 0.0 | 0.01 | |
| | Period | 12 | | | | | | | | | | | | |
| 28 | 8/25 | 12 | 65 | 780 | 6 | 1 | 5,308 | 8 | 4 | 0.01 | 6.81 | 0.0 | 0.0 | |
| | Period | 12 | | | | | | | | | | | | |
| 29 | 8/27 | 12 | 57 | 684 | 3 | 0 | 5,975 | 6 | 2 | 0.0 | 8.74 | 0.0 | 0.0 | |
| | Period | 12 | | | | | | | | | | | | |
| 30 | 8/30 | 12 | 53 | 636 | 0 | 0 | 9,431 | 0 | 0 | 0.0 | 14.8 | 0.0 | 0.0 | |
| | Period | 12 | | | | | | | | | | | | |
| 31 | 9/1 | 12 | | | | | NO BUYER | | | | | | | |
| | Period | 12 | | | | | | | | | | | | |
| 32 | 9/3 | 12 | | | | | NO BUYER | | | | | | | |
| | Period | 12 | | | | | | | | | | | | |
| 33 | 9/6 | 12 | | | | | NO BUYER | | | | | | | |
| | Period | 12 | | | | | | | | | | | | |
| 34 | 9/7 | 12 | | | | | NO BUYER | | | | | | | |
| | Period | 12 | | | | | | | | | | | | |
| Grand Total | | | 360 | 177 | 22,656 | 22,106 | 25,685 | 73,651 | 11,838 | 33,336 | 0.98 | 3.25 | 1.13 | 1.47 |

-39-

34,246

Table 11. Commercial salmon catch data, Goodnews Bay (District 5, Stat. Area 335-50), all gear combined 1982.

| Period Code | Date of Landing | Hours Open to Fishing | Fishermen | Fishermen Hours | Catch | | | | | Catch/Fisherman Hour | | | |
|-------------|-----------------|-----------------------|-----------|-----------------|-------|-------|------|------|-------|----------------------|------|------|------|
| | | | | | King | Red | Coho | Pink | Chum | King | Coho | Red | Chum |
| 1 | 6/17 | 6 | 18 | 216 | 362 | 744 | | | 167 | 1.68 | | 3.4 | .77 |
| | 6/18 | 6 | | | | | | | | | | | |
| | Period | 12 | | | | | | | | | | | |
| 2 | 6/21 | 6 | 29 | 348 | 1,535 | 1,280 | | | 698 | 4.4 | | 5.2 | 2.0 |
| | 6/22 | 6 | | | | | | | | | | | |
| | Period | 12 | | | | | | | | | | | |
| 3 | 6/24 | 6 | 30 | 360 | 620 | 2,120 | | | 594 | 1.7 | | 5.9 | 1.65 |
| | 6/25 | 6 | | | | | | | | | | | |
| | Period | 12 | | | | | | | | | | | |
| 4 | 6/28 | 6 | 29 | 348 | 959 | 3,371 | | | 649 | 2.76 | | 9.7 | 1.9 |
| | 6/29 | 6 | | | | | | | | | | | |
| | Period | 12 | | | | | | | | | | | |
| 5 | 6/30 | 6 | 34 | 2,040 | 1,551 | 8,143 | | | 1,627 | 0.76 | | 4.0 | 0.80 |
| | 7/1 | 24 | | | | | | | | | | | |
| | 7/2 | 24 | | | | | | | | | | | |
| | 7/3 | 6 | | | | | | | | | | | |
| | Period | 60 | | | | | | | | | | | |
| 6 | 7/5 | 6 | 30 | 720 | 1,809 | 4,221 | | | 1,976 | 2.51 | | 5.86 | 2.74 |
| | 7/6 | 18 | | | | | | | | | | | |
| | Period | 24 | | | | | | | | | | | |
| 7 | 7/7 | 6 | 32 | 768 | 738 | 4,833 | | | 1,890 | 0.96 | | 6.29 | 2.46 |
| | 7/8 | 18 | | | | | | | | | | | |
| | Period | 24 | | | | | | | | | | | |
| 8 | 7/9 | 6 | 38 | 912 | 351 | 3,751 | | 488 | 1,191 | 0.38 | | 4.11 | 1.31 |
| | 7/10 | 18 | | | | | | | | | | | |
| | Period | 24 | | | | | | | | | | | |
| 9 | 7/12 | 6 | 35 | 840 | 737 | 2,318 | | 582 | 1,384 | 0.88 | | 2.76 | 1.65 |
| | 7/13 | 18 | | | | | | | | | | | |
| | Period | 24 | | | | | | | | | | | |
| 10 | 7/14 | 6 | 31 | 448 | 514 | 2,481 | | 960 | 2,123 | 0.69 | | 3.33 | 2.85 |
| | 7/15 | 18 | | | | | | | | | | | |
| | Period | 24 | | | | | | | | | | | |
| 11 | 7/16 | 6 | 19 | 456 | 66 | 1,281 | | 497 | 476 | 0.14 | | 2.81 | 1.04 |
| | 7/17 | 18 | | | | | | | | | | | |
| | Period | 24 | | | | | | | | | | | |
| 12 | 7/19 | 6 | 37 | 888 | 66 | 1,683 | 6 | 958 | 506 | 0.07 | 0.01 | 1.90 | 0.57 |
| | 7/20 | 18 | | | | | | | | | | | |
| | Period | 24 | | | | | | | | | | | |
| 13 | 7/21 | 6 | 26 | 312 | 68 | 507 | 7 | 406 | 233 | 0.22 | 0.02 | 1.63 | 0.75 |
| | 7/22 | 6 | | | | | | | | | | | |
| | Period | 12 | | | | | | | | | | | |
| 14 | 7/23 | 6 | 9 | 108 | 17 | 162 | 13 | 158 | 35 | 0.16 | 0.12 | 1.50 | 0.32 |
| | 7/24 | 6 | | | | | | | | | | | |
| | Period | 12 | | | | | | | | | | | |

Table 11. (Continued)

| Period Code | Date of Landing | Hours Open to Fishing | Fishermen | Fishermen Hours | Catch | | | | | Catch/Fisherman Hour | | | |
|-------------|-----------------|-----------------------|-----------|-----------------|-------|--------|--------|-------|--------|----------------------|-------|------|------|
| | | | | | King | Red | Coho | Pink | Chum | King | Coho | Red | Chum |
| 15 | 7/26 | 6 | | | | | | | | | | | |
| | 7/27 | 6 | | | | | | | | | | | |
| | Period | 12 | | | | | | | | | | | |
| 16 | 7/28 | 6 | 21 | 252 | 5 | 278 | 153 | 190 | 93 | 0.02 | 0.61 | 1.10 | 0.37 |
| | 7/30 | 6 | | | | | | | | | | | |
| | Period | 12 | | | | | | | | | | | |
| 17 | 7/30 | 6 | 17 | 204 | 19 | 344 | 237 | 94 | 42 | 0.09 | 1.16 | 1.69 | 0.21 |
| | 7/31 | 6 | | | | | | | | | | | |
| | Period | 12 | | | | | | | | | | | |
| 18 | 8/2 | 12 | 30 | 360 | 19 | 335 | 1,148 | 153 | 47 | 0.05 | 3.19 | 0.93 | 0.13 |
| | Period | 12 | | | | | | | | | | | |
| 19 | 8/4 | 12 | 24 | 288 | 12 | 188 | 949 | 111 | 29 | 0.04 | 3.30 | 0.65 | 0.10 |
| | Period | 12 | | | | | | | | | | | |
| 20 | 8/6 | 12 | 28 | 336 | 6 | 251 | 1,713 | 42 | 31 | 0.02 | 5.10 | 0.75 | 0.09 |
| | Period | 12 | | | | | | | | | | | |
| 21 | 8/9 | 12 | 26 | 312 | 11 | 46 | 2,240 | 14 | 19 | 0.04 | 7.18 | 0.15 | 0.06 |
| | Period | 12 | | | | | | | | | | | |
| 22 | 8/11 | 12 | 32 | 384 | 5 | 0 | 6,065 | 16 | 13 | 0.01 | 15.80 | 0.0 | 0.03 |
| | Period | 12 | | | | | | | | | | | |
| 23 | 8/13 | 12 | 21 | 252 | 0 | 0 | 1,561 | 4 | 2 | 0.0 | 6.19 | 0.0 | 0.01 |
| | Period | 12 | | | | | | | | | | | |
| 24 | 8/16 | 12 | 29 | 348 | 0 | 0 | 5,456 | 0 | 0 | 0.0 | 15.68 | 0.0 | 0.0 |
| | Period | 12 | | | | | | | | | | | |
| 25 | 8/18 | 12 | 20 | 240 | 0 | 0 | 1,446 | 0 | 0 | 0.0 | 6.03 | 0.0 | 0.0 |
| | Period | 12 | | | | | | | | | | | |
| 26 | 8/20 | 12 | 1 | 12 | 1 | 0 | 68 | 0 | 0 | 0.08 | 5.67 | 0.0 | 0.0 |
| | Period | 12 | | | | | | | | | | | |
| 27 | 8/23 | 12 | 25 | 300 | 0 | 0 | 5,306 | 0 | 0 | 0.0 | 17.69 | 0.0 | 0.0 |
| | Period | 12 | | | | | | | | | | | |
| 28 | 8/25 | 12 | 28 | 336 | 0 | 0 | 3,158 | 0 | 0 | 0.0 | 9.40 | 0.0 | 0.0 |
| | Period | 12 | | | | | | | | | | | |
| 29 | 8/27 | 12 | 38 | 456 | 3 | 0 | 6,625 | 0 | 0 | 0.1 | 14.5 | 0.0 | 0.0 |
| | Period | 12 | | | | | | | | | | | |
| 30 | 8/30 | 12 | 33 | 396 | 2 | 0 | 3,730 | 0 | 0 | 0.01 | 9.42 | 0.0 | 0.0 |
| | Period | 12 | | | | | | | | | | | |
| 31 | 9/1 | 12 | 31 | 372 | 0 | 0 | 2,778 | 0 | 4 | 0.0 | 7.47 | 0.0 | 0.0 |
| | Period | 12 | | | | | | | | | | | |
| 32 | 9/3 | 12 | 26 | 312 | 0 | 0 | 2,309 | 0 | 0 | 0.0 | 7.40 | 0.0 | 0.0 |
| | Period | 12 | | | | | | | | | | | |
| 33 | 9/6 | 12 | 28 | 336 | 0 | 0 | 1,715 | 0 | 0 | 0.0 | 5.10 | 0.0 | 0.0 |
| | Period | 12 | | | | | | | | | | | |
| 34 | 9/8 | 12 | | | | | | | | | | | |
| | Period | 12 | | | | | | | | | | | |
| Grand Total | | 540 | 48 | 14,556 | 9,476 | 38,877 | 46,683 | 4,673 | 13,829 | 0.65 | 3.20 | 2.70 | 0.95 |

NO BUYER PRESENT

Table 12. Aerial salmon escapement surveys in the Kuskokwim area, 1982. 1/

| | Date | Kings | Red | Cohos | Pinks | Chums |
|--------------------------|---------|-------|--------|----------------|--------|--------|
| KUSKOKWIM BAY | | | | | | |
| Goodnews River System | 8/05/82 | 3,356 | 21,487 | 275 | 4,425 | 16,000 |
| Goodnews River | | 1,990 | 19,160 | - | 2,100 | 9,700 |
| Goodnews Lake | | | | (Not Reported) | | |
| Middle Fork | | 1,546 | 2,32 | 9,700 | 3,325 | 6,300 |
| Middle Fork Lakes | | | | (Not Reported) | | |
| Kanektok River System | 8/06/82 | 8,142 | 55,950 | 9,700 | 67,621 | 8,820 |
| Kanektok River | | 8,142 | 41,400 | 9,700 | 67,621 | 8,820 |
| Kagati Lake | | - | 14,550 | - | - | - |
| KUSKOKWIM RIVER | | | | | | |
| Aniak River System | 8/04/82 | 2,336 | 65 | - | 315 | 32,165 |
| Aniak River | | 2,210 | 20 | - | 270 | 31,990 |
| Salmon River | | 126 | 45 | - | - | 175 |
| Kipchuk River | | | | (Not Surveyed) | | |
| Kwethluk River System | 8/04/82 | 18 | 30 | - | - | - |
| Kwethluk River | | 18 | 30 | - | - | - |
| Canyon Creek | | | | (Not Surveyed) | | |
| Kisaralik River | 8/04/82 | 81 | - | - | - | - |
| Gagaryah River 2/ | 8/07/82 | - | - | - | - | - |
| Salmon R. (Pitka) System | 7/28/82 | 419 | - | - | - | - |
| North fork | | 69 | - | - | - | - |
| Middle fork | | 66 | - | - | - | - |
| South fork | | 284 | - | - | - | - |

1/ All surveys were rated fair or good unless noted.

2/ Poor survey conditions.

Appendix Table 1. Kuskokwim River Distances.

| | Distances From: | | | |
|--|-----------------|-------|-----------|-------|
| | Mouth | | Bethel | |
| | Kilometer | Miles | Kilometer | Miles |
| <u>Kuskokwim River</u> | | | | |
| Kuskokwim River Mouth, 60.08 N, 162.42 W | 0.0 | 0.0 | -126.1 | -78.4 |
| Eek Island, North End, 60 10' | 27.1 | 17.0 | -99.0 | -61.5 |
| Eek River | 35.5 | 22.1 | -100.0 | -62.1 |
| Kwegooyuk | 38.3 | 23.8 | -87.78 | -54.5 |
| Kinak River | 47.7 | 29.6 | -78.4 | -48.7 |
| Tuntutuliak Village | 56.8 | 35.3 | -87.6 | -54.4 |
| Kialik River | 59.5 | 37.0 | -66.6 | -41.4 |
| Fowler Island | 84.3 | 52.4 | -41.8 | -26.0 |
| Johnson River | 94.1 | 58.4 | -32.1 | -19.9 |
| Napakiak Village | 104.3 | 64.8 | -21.9 | -13.6 |
| Napaskiak Village | 114.5 | 71.2 | -11.6 | -7.2 |
| Oscarville Village | 115.3 | 71.6 | -10.8 | -6.7 |
| Bethel City | 126.1 | 78.4 | 0.0 | 0.0 |
| Gweek River | 144.7 | 89.9 | 18.6 | 11.6 |
| Kwethluk Village | 158.9 | 98.7 | 32.8 | 20.4 |
| Akiachuk Village | 169.0 | 105.0 | 42.9 | 26.6 |
| Kasigluk River | 174.5 | 108.4 | 48.3 | 30.0 |
| Kisaralik River | 175.7 | 109.2 | 49.6 | 30.8 |
| Akiak Village | 189.8 | 117.9 | 63.6 | 39.5 |
| Mishevik Slough | 197.6 | 122.8 | 71.4 | 44.4 |
| Tuluksak Village | 218.4 | 135.7 | 92.3 | 57.3 |
| Mud Creek Slough | 298.2 | 185.3 | 172.0 | 106.9 |
| Lower Kalskag Village | 304.7 | 189.3 | 178.6 | 111.0 |
| Kalskag Village | 308.7 | 191.8 | 182.6 | 113.5 |
| Aniak Village, Aniak River | 362.2 | 225.1 | 236.1 | 146.7 |
| Chuathbaluk Village | 375.4 | 233.3 | 249.3 | 154.9 |
| Kolmakof River | 395.8 | 246.0 | 269.7 | 167.6 |
| Uaimut Village | 409.8 | 254.6 | 283.7 | 176.3 |
| Ilokuk River | 414.6 | 257.6 | 288.5 | 179.3 |
| Kawalik River | 449.0 | 279.0 | 322.9 | 200.6 |
| Crooked Creek Village | 467.2 | 290.3 | 341.1 | 211.9 |
| Georgetwon Village, George River | 496.7 | 308.6 | 370.5 | 230.2 |
| Red Devil Village | 526.0 | 326.9 | 399.9 | 248.5 |
| Sleetmute Village | 538.6 | 334.7 | 412.5 | 256.3 |
| Holitna River | 541.2 | 336.3 | 415.1 | 257.9 |
| Stony River Village | 585.2 | 363.6 | 459.0 | 285.2 |
| Stony River | 586.9 | 364.7 | 460.8 | 286.3 |
| Swift River | 612.1 | 380.4 | 486.0 | 302.0 |
| Tatlawisksuk River | 617.1 | 383.4 | 491.0 | 305.1 |
| Devil's Elbow | 645.3 | 401.0 | 519.2 | 322.6 |
| Vinassale | 735.8 | 460 | 610 | 381 |
| McGrath Village | 811 | 507 | 685 | 428 |
| Middle Fork | 885 | 553 | 759 | 474 |
| Big River | 896.1 | 560 | 770 | 481 |
| Pifka Fork | 916 | 572 | 790 | 494 |
| Medfra Village | 922.7 | 577 | 797 | 499 |
| South Fork | 927 | 579 | 801 | 501 |
| Nikolai Village | 993.6 | 621 | 868 | 542 |
| East Fork | 938 | 586 | 812 | 508 |
| North Fork | 938 | 586 | 812 | 508 |
| Swift Fork | 1,129.1 | 706 | 1,003 | 627 |
| Telida Village | 1,178.2 | 736 | 1,052 | 658 |
| Highpower Co. | 1,193.1 | 746 | 1,067 | 667 |
| Fish Creek | 1,277.4 | 798 | 1,151 | 719 |
| North Fork Lake | | 829 | 1,201 | 751 |
| Top of Kuskokwim Drainage | | 931 | 1,364 | 852 |

Appendix Table 2. Fishes commonly found in the Kuskokwim Area.

| Species Code | Genus and species | Common name |
|--------------|---------------------------------|---------------------|
| 162 | <i>Cottus cognatus</i> | Slimy Sculpin |
| 410 | <i>Oncorhynchus tshawytscha</i> | King Salmon |
| 420 | <i>Oncorhynchus nerka</i> | Red Salmon |
| 430 | <i>Oncorhynchus kisutch</i> | Coho Salmon |
| 440 | <i>Oncorhynchus gorbuscha</i> | Pink Salmon |
| 450 | <i>Oncorhynchus keta</i> | Chum Salmon |
| 500 | <i>Esox lucius</i> | Pike |
| 513 | <i>Osmerus eperlanus</i> | Boreal Smelt |
| 514 | <i>Hypomesus olidus</i> | Pond Smelt |
| 520 | <i>Salvelinus alpinus</i> | Char |
| 541 | <i>Salmo gairdneri</i> | Rainbow Trout |
| 550 | <i>Salvelinus namaycush</i> | Lake Trout |
| 570 | <i>Stenodus leucichthys</i> | Shee |
| 581 | <i>Coregonus nasus</i> | Broad Whitefish |
| 582 | <i>Coregonus pidschian</i> | Humpback Whitefish |
| 583 | <i>Coregonus albula</i> | Least Cisco |
| 584 | <i>Coregonus autumnalis</i> | Arctic Cisco |
| 585 | <i>Prosopium cylindraceum</i> | Round Whitefish |
| 590 | <i>Lota lota</i> | Burbot, Lush |
| 601 | <i>Lampetra japonica</i> | Arctic Lamprey |
| 610 | <i>Thymallus arcticus</i> | Arctic Grayling |
| 630 | <i>Dallia pectoralis</i> | Blackfish |
| 640 | <i>Catostomus catostomus</i> | Longnose Sucker |
| 661 | <i>Pungitius pungitius</i> | 9-spine Stickleback |
| 113 | <i>Eleginus gracilis</i> | Saffron Cod |
| 121 | <i>Pleuronectes stellatus</i> | Starry Flounder |
| 122 | <i>Liopsetta glacialis</i> | Arctic Flounder |
| 166 | <i>Oligocottus maculosus</i> | Sculpin |
| 200 | <i>Hippoglossus stenolepis</i> | Pacific Halibut |
| 230 | <i>Clupea pallasii</i> | Pacific Herring |
| 516 | <i>Mallotus villosus</i> | Capelin |

Appendix Table 3. Kuskokwim area commercial and subsistence salmon catches, 1913-1982.

| Year | Commercial Catch | | | | | Subsistence Catch 1/ | | | |
|-----------------------|------------------|---------|---------|--------|---------|----------------------|--------|-----------------|------------|
| | King | Red | Coho | Pink | Chum | Total | King | 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 | | 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 | | | |
| 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 | 3/ 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 |
| 1978 | 63,194 | 13,734 | 247,271 | 61,968 | 282,044 | 668,211 | 38,209 | 4/ 137,489 | 4/ 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 |
| Previous year average | 60,477 | 43,994 | 285,235 | 18,749 | 385,058 | 793,513 | 55,439 | 167,965 | 235,404 |

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.

Appendix Table 4. Kuskokwim area, commercial effort by district, 1970-1982. 1/

| District 1 | | | | |
|----------------------------|-------------|----------------------------|-------------|-------|
| Year | King Season | Chum Season | Coho Season | Total |
| 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 |
| Previous 5 Year Average | 582 | 590 | 591 | 681 |
| 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 |
| Previous 5 Year Average | 68 | 29 | 18 | 77 |
| 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 | |
| Previous 5 Year Average | 204 | Previous 5 Year Average | 39 | |

1/ Number of actual fishing vessels.
2/ No commercial fishing allowed.

Appendix Table 5. Kuskokwim area commercial catches by drainage, 1960-1982.

| Kuskokwim River 1/ | King | Red | Coho | Pink | Chum | Total |
|----------------------------|--------|--------|---------|--------|---------|---------|
| 1960 | 5,969 | 0 | 2,498 | 0 | | 8,467 |
| 1961 | 18,918 | 0 | 5,044 | 0 | | 23,962 |
| 1962 | 15,341 | 0 | 12,432 | 0 | | 27,773 |
| 1963 | 12,016 | 0 | 15,660 | 0 | | 27,676 |
| 1964 | 17,149 | 0 | 28,613 | 0 | | 45,762 |
| 1965 | 21,989 | 0 | 12,191 | 0 | | 34,180 |
| 1966 | 25,545 | 0 | 22,985 | 0 | | 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 |
| Previous 5 Year Average | 40,796 | 11,980 | 221,416 | 1,441 | 332,228 | 607,859 |
| Kanektok River 2/ | King | Red | Coho | Pink | Chum | Total |
| 1960 | 0 | 5,649 | 3,000 | 0 | 0 | 8,649 |
| 1961 | 4,328 | 2,308 | 46 | 90 | 18,854 | 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 4/ | 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 | 143,080 |
| 1982 | 22,106 | 25,685 | 73,651 | 11,838 | 33,336 | 166,616 |
| Previous 5 Year Average | 15,496 | 12,490 | 37,373 | 13,872 | 42,760 | 122,031 |

and weight (lbs.), Kuskokwim area, 1968-1982 1/.

| | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 |
|-------|-----------|-----------|-----------|-----------|------------|------------|
| 1 | 1,400,243 | 1,371,685 | 566,941 | 159,845 | 935,652 | 1,326,773 |
| 2 | 4,319 | 37,816 | 179,768 | 108,216 | 95,761 | 154,706 |
| 3 | 152,832 | 883,966 | 1,245,132 | 670,598 | 809,916 | 2,009,171 |
| 4 | 6,442 | 2,092 | 246,134 | 2,809 | 133,911 | 1,678 |
| 5 | 631,781 | 1,252,607 | 1,220,496 | 1,350,936 | 1,609,718 | 2,185,549 |
| 6 | 62,963 | 165,574 | 2/ | 43,113 | 120,405 3/ | 109,105 3/ |
| <hr/> | | | | | | |
| | 1982 | | | | | |
| <hr/> | | | | | | |

33 1,541,023
 18 707,560
 36 4,143,834
 28 66,202
 40 2,379,227

21 2/

opped out of district.

Appendix Table 5. (Continued)

| Goodnews Bay 3/ Goodnews River | King | Red | 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/ | 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 |
| Previous 5 Year Average | 4,184 | 19,524 | 26,440 | 3,435 | 9,962 | 63,456 |

- 1/ Includes districts 335-10 and 335-20.
2/ District 335-40.
3/ District 335-50 and includes Chagvan Bay.
4/ Final Catch Data Used.

Appendix Table 6. Kuskokwim area commercial king salmon catches, by district, 1960-1982.

| Total Catch | | | | | | |
|-------------------------|--------|--------|--------|--------|--------|--------|
| Year | 335-10 | 335-20 | 335-30 | 335-40 | 335-50 | Total |
| 1960 | 2,297 | 1,231 | 1,811 | 0 | | 5,969 |
| 1961 | 15,820 | 1,551 | 1,547 | 4,328 | | 23,246 |
| 1962 | 13,306 | 2,035 | 0 | 5,526 | | 20,867 |
| 1963 | 9,095 | 2,921 | 0 | 6,555 | | 18,571 |
| 1964 | 15,574 | 1,395 | 0 | 4,081 | | 21,230 |
| 1965 | 21,452 | 537 | 0 | 2,976 | | 24,965 |
| 1966 | 25,212 | 333 | 0 | 278 | | 25,823 |
| 1967 | 29,367 | 615 | | 0 | | 29,986 |
| 1968 | 33,451 | 826 | | 8,879 | | 43,157 |
| 1969 | 43,141 | 853 | | 16,802 | 3,978 | 64,777 |
| 1970 | 37,715 | 1,463 | | 18,629 | 7,163 | 65,082 |
| 1971 | 35,421 | 2,439 | | 4,185 | 477 | 44,936 |
| 1972 | 37,699 | 1,755 | | 15,880 | 264 | 55,482 |
| 1973 | 28,194 | 2,244 | | 14,993 | 3,543 | 51,374 |
| 1974 | 16,031 | 951 | | 8,704 | 3,302 | 30,670 |
| 1975 | 18,235 | 1,319 | | 3,928 | 2,151 | 27,799 |
| 1976 | 20,010 | 3,316 | | 14,110 | 4,417 | 49,262 |
| 1977 | 28,685 | 3,975 | | 19,090 | 3,336 | 55,086 |
| 1978 | 36,139 | 2,087 | | 12,335 | 5,218 | 55,779 |
| 1979 | 24,633 | 2,913 | | 11,144 | 3,204 | 41,894 |
| 1980 | 26,812 | 1,697 | | 10,387 | 1,974 | 40,655 |
| 1981 | 29,882 | 4,771 | | 24,524 | 7,190 | 66,367 |
| 1982 | 38,088 | 2,113 | | 22,106 | 9,476 | 71,783 |
| Previous 5 Year Ave. | 29,320 | 3,143 | | 15,496 | 4,184 | 51,596 |

Appendix Table 7. Commercial salmon pack by species in round weight (lbs.), Kuskokwim area, 1968-1982 1/.

| | 1968 | 1969 | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 |
|----------------------------|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|
| <u>Fresh or frozen</u> | | | | | | | | | | |
| King | 794,682 | 1,032,863 | 1,113,890 | 801,628 | 1,400,243 | 1,371,685 | 566,941 | 159,845 | 935,652 | 1,326,773 |
| Red | 36,480 | 25,351 | 68,116 | 30,635 | 4,319 | 37,816 | 179,768 | 108,216 | 95,761 | 154,706 |
| Coho | 1,090,690 | 322,254 | 453,125 | 64,457 | 152,832 | 883,966 | 1,245,132 | 670,598 | 809,916 | 2,009,171 |
| Pink | 303,270 | 3,413 | 90,703 | | 6,442 | 2,092 | 246,134 | 2,809 | 133,911 | 1,678 |
| Chum | 146,230 | 249,007 | 367,715 | 678,173 | 631,781 | 1,252,607 | 1,220,496 | 1,350,936 | 1,609,718 | 2,185,549 |
| <u>Salmon roe,</u> | | | | | | | | | | |
| (lbs. of finished product) | 2/ | 56,926 | 42,958 | 64,136 | 62,963 | 165,574 | 2/ | 43,113 | 120,405 3/ | 109,105 3/ |
| | 1978 | 1979 | 1980 | 1981 | 1982 | | | | | |
| <u>Fresh or frozen</u> | | | | | | | | | | |
| King | 1,530,461 | 999,043 | 617,137 | 1,462,593 | 1,541,023 | | | | | |
| Red | 89,489 | 320,541 | 290,251 | 761,848 | 707,560 | | | | | |
| Coho | 1,758,213 | 2,418,186 | 2,234,781 | 1,862,836 | 4,143,834 | | | | | |
| Pink | 241,523 | 2,290 | 107,719 | 1,628 | 66,202 | | | | | |
| Chum | 2,508,123 | 2,059,686 | 3,471,378 | 3,538,440 | 2,379,227 | | | | | |
| <u>Salmon roe,</u> | | | | | | | | | | |
| (lbs. of finished product) | 142,496 3/ | | 110,806 | 26,321 | 2/ | | | | | |

1/ Pack represents type of processing when fish were shipped out of district.

2/ Information not available.

3/ Raw product.

Appendix Table 8. Mean salmon weights and prices paid to fishermen, Kuskokwim area, 1964-1982.

| Year | King | Mean Weights-lbs. | | | |
|------|------|-------------------|-----|------|------|
| | | Coho | Red | Pink | Chum |
| 1964 | 23.2 | 6.5 | 5.8 | | 6.1 |
| 1965 | 21.7 | 6.5 | 6.6 | | |
| 1966 | 23.2 | 6.7 | | | |
| 1967 | 27.8 | 5.9 | 7.4 | | 7.0 |
| 1968 | 23.8 | 7.2 | 6.2 | 4.0 | 7.9 |
| 1969 | 19.6 | 7.3 | 6.2 | 3.6 | 5.8 |
| 1970 | 18.9 | 7.3 | 5.4 | 3.3 | 6.1 |
| 1971 | 26.2 | 6.1 | 6.9 | 2/ | 6.4 |
| 1972 | 24.7 | 6.4 | 2/ | 2/ | 6.5 |
| 1973 | 26.7 | 5.8 | 2/ | 2/ | 6.8 |
| 1974 | 17.1 | 7.5 | 6.3 | 4.1 | 6.8 |
| 1975 | 14.9 | 8.2 | 2/ | 2/ | 6.4 |
| 1976 | 17.0 | 7.8 | 6.7 | 3.5 | 7.0 |
| 1977 | 22.7 | 7.8 | 8.3 | 3.9 | 7.3 |
| 1978 | 24.2 | 7.1 | 6.5 | 3.9 | 8.9 |
| 1979 | 16.6 | 7.9 | 6.9 | 3.9 | 7.0 |
| 1980 | 14.1 | 6.9 | 6.7 | 3.6 | 6.4 |
| 1981 | 17.8 | 6.4 | 7.2 | 3.5 | 7.5 |
| 1982 | 19.3 | 7.3 | 7.2 | 3.6 | 7.3 |

| Year | King | Mean prices per fish (mean price per pound) | | | |
|---------|---------------|---|----------------|------------|-------------|
| | | Coho | Red | Pink | Chum |
| 1964 | \$3.25 (0.14) | \$.35 (0.05) | \$.50 (0.09) | \$ | \$ |
| 1965 1/ | | | | | |
| 1966 | 3.00 (0.13) | .40 (0.06) | .50 | .10 | .10 |
| 1967 | 3.55 (0.13) | .52 (0.09) | .40 (0.05) | | .25 (0.04) |
| 1968 | 3.74 (0.16) | .67 (0.09) | .60 (0.10) | .20 (0.05) | .35 (0.04) |
| 1969 | 3.80 (0.19) | .76 (0.10) | .91 (0.15) | .22 (0.06) | .43 (0.07) |
| 1970 | 3.78 (0.20) | 1.03 (0.14) | 1.15 (0.21) | .26 (0.08) | .51 (0.08) |
| 1971 3/ | 4.53 (0.17) | .82 (0.13) | .71 (0.10) | 2/ | .50 (0.08) |
| 1972 | 4.93 (0.20) | 1.00 (0.16) | .88 | .25 | .54 (0.08) |
| 1973 | 6.83 (0.25) | 1.50 (0.26) | 2.32 | .53 | 1.28 (0.19) |
| 1974 | 7.96 (0.46) | 2.00 (0.27) | 2.15 (0.34) | .93 (0.23) | 1.71 (0.25) |
| 1975 | 8.05 (0.54) | 2.54 (0.31) | 2/ | 2/ | 1.67 (0.26) |
| 1976 | 10.82 (0.64) | 3.12 (0.40) | 4/ 2.85 (0.43) | .88 (0.25) | 1.89 (0.27) |
| 1977 | 26.11 (1.15) | 5.07 (0.65) | 3.74 (0.45) | .98 (0.25) | 3.29 (0.45) |
| 1978 | 12.09 (0.50) | 2.85 (0.40) | 3.18 (0.49) | .48 (0.12) | 2.83 (0.32) |
| 1979 | 10.96 (0.66) | 5.93 (0.75) | 3.66 (0.53) | .43 (0.11) | 2.59 (0.37) |
| 1980 | 6.70 (0.47) | 4.43 (0.64) | 2.08 (0.31) | .45 (0.12) | 1.51 (0.24) |
| 1981 | 15.40 (0.87) | 4.06 (0.63) | 4.36 (0.61) | .40 (0.11) | 1.69 (0.23) |
| 1982 | 15.49 (0.82) | 3.82 (0.53) | 2.97 (0.41) | .19 (0.05) | 1.57 (0.22) |

1/ Samples available only for two periods - 7/1-2 - 7/5-6.

2/ Information unavailable.

3/ Information not available for 335-50 (Goodnews) only fished one day.

4/ Information not available for 335-40 (Quinhagak).

Appendix Table 9. Dollar value estimates of Kuskokwim area commercial fishery, 1964-1982. 1/

| Year | Gross value of catch to fishermen | Wages earned 2/ | Total income to district | Wholesale value of pack 3/ | Tax revenue to state |
|------|-----------------------------------|-----------------|--------------------------|----------------------------|----------------------|
| 1964 | \$83,030.00 | \$ | \$ | \$409,700.00 | \$ 6,100.00 |
| 1965 | 90,950.00 | | | 370,000.00 | 8,200.00 |
| 1966 | 87,466.00 | | | 406,500.00 | 8,100.00 |
| 1967 | 138,647.00 | 20,000.00 | 158,647.00 | 727,000.00 | |
| 1968 | 290,370.00 | 40,000.00 | 330,370.00 | 1,135,000.00 | 17,000.00 |
| 1969 | 297,233.00 | 60,435.00 | 357,668.00 | | |
| 1970 | 362,470.00 | 127,327.00 | 489,797.00 | 1,300,000.00 | 20,000.00 |
| 1971 | 371,220.00 | 80,510.00 | 451,730.00 | 672,180.00 | 16,770.00 |
| 1972 | 360,727.00 | 85,895.00 | 447,662.00 | | |
| 1973 | 827,735.00 | 150,000.00 | 977,735.00 | 3,600,000.00 | 32,000.00 |
| 1974 | 1,056,042.00 | 150,000.00 | 1,206,042.00 | | |
| 1975 | 899,178.00 | 165,000.00 | | 2,000,000.00 | 25,000.00 |
| 1976 | 1,380,229.00 | 175,000.00 | 1,555,229.00 | | |
| 1977 | 3,891,950.00 | 200,000.00 | 4,091,950.00 | | |
| 1978 | 2,337,470.00 | 250,000.00 | 2,578,470.00 | | |
| 1979 | 3,678,000.00 | 275,000.00 | 3,953,000.00 | | |
| 1980 | 2,725,134.00 | 300,000.00 | 3,025,134.00 | | |
| 1981 | 3,766,525.00 | 325,000.00 | 4,091,525.00 | | |
| 1982 | 4,213,954.00 | 350,000.00 | 4,563,954.00 | | |

1/ Information not available for wages earned during 1964-1966.

2/ Includes wages paid to tenderboat operators, processing plant employees in district.

3/ Based on type of processing when fish were shipped out of the district.

Appendix Table 10. Utilization of Kuskokwim River king salmon, 1960-1982.

| Year | Commercial Catch 1/ | Subsistence Catch 1/ | Total Utilization |
|----------------------------|------------------------|-------------------------|----------------------|
| 1960 | 5,969 | 20,361 | 26,330 |
| 1961 | 18,918 | 30,910 | 49,828 |
| 1962 | 15,341 | 14,642 | 29,983 |
| 1963 | 12,016 | 37,246 | 49,262 |
| 1964 | 17,149 | 29,017 | 46,166 |
| 1965 | 21,989 | 27,143 | 49,132 |
| 1966 | 25,545 | 49,606 | 75,151 |
| 1967 | 29,986 | 57,875 | 87,861 |
| 1968 | 34,278 | 30,230 | 64,508 |
| 1969 | 43,997 | 40,138 | 84,135 |
| 1970 | 39,290 | 69,204 | 108,494 |
| 1971 | 40,274 | 42,926 | 83,200 |
| 1972 | 39,454 | 40,145 | 79,599 |
| 1973 | 32,838 | 38,526 | 71,365 |
| 1974 | 18,664 | 26,665 | 45,329 |
| 1975 | 21,720 | 47,784 | 69,504 |
| 1976 | 30,735 | 58,185 | 88,920 |
| 1977 | 35,830 | 55,577 | 91,407 |
| 1978 | 45,641 | 35,881 | 81,522 |
| 1979 | 38,966 | 55,524 | 94,490 |
| 1980 | 35,881 | 59,900 | 95,781 |
| 1981 | 47,663 | 59,669 | 107,332 |
| 1982 | 48,234 | 53,310 | 105,937 |
| Previous 5 Year Average | 40,796 | 53,310 | 94,106 |

- 1/ Districts 335-10, 335-20 and 335-30 to the Swift River.
- 2/ Catches are expanded and include all villages surveyed each year.
- 3/ Data includes a few villages that are not included in comparative catch tables.

Appendix Table 11. Comparative king salmon catches by fishing period during the king salmon season, Kuskokwim River (District 1, 335-10), 1974-1982.

| Year | Date | Catch | Fishermen | Fishermen Hours | Catch/Hr. |
|------|------------|--------|-----------|-----------------|-----------|
| 1974 | June 10-11 | 4,384 | 422 | 5,064 | 0.9 |
| | June 13-14 | 5,790 | 488 | 5,856 | 1.0 |
| | June 17-18 | 5,857 | 506 | 6,072 | 1.0 |
| | Totals | 16,031 | 606 | 16,992 | 0.9 |
| 1975 | June 16 | 359 | 12 | 72 | 5.0 |
| | June 19-20 | 1,031 | 46 | 552 | 1.9 |
| | June 23-24 | 17,235 | 483 | 5,796 | 2.9 |
| | Totals | 18,625 | 541 | 6,420 | 2.9 |
| 1976 | June 17 | 6,962 | 459 | 2,754 | 2.5 |
| | June 21 | 13,048 | 495 | 2,970 | 4.4 |
| | Totals | 20,010 | 561 | 5,724 | 3.5 |
| 1977 | June 15 | 12,458 | 467 | 2,802 | 4.5 |
| | June 20 | 16,227 | 484 | 2,904 | 5.6 |
| | Totals | 28,685 | 563 | 5,706 | 5.0 |
| 1978 | June 9 | 7,590 | 509 | 3,054 | 2.5 |
| | June 14 | 6,142 | 266 | 1,596 | 3.9 |
| | June 16 | 12,341 | 396 | 2,376 | 5.2 |
| | June 22 | 1,724 | 72 | 288 | 6.0 |
| | June 23 | 8,342 | 429 | 1,716 | 4.9 |
| | Totals | 36,139 | 615 | 9,030 | 4.0 |
| 1979 | June 11 | 12,270 | 523 | 3,138 | 3.9 |
| | June 15 | 12,363 | 549 | 3,294 | 3.8 |
| | Totals | 24,633 | 591 | 6,432 | 3.8 |
| 1980 | June 12 | 9,891 | 469 | 2,814 | 3.5 |
| | June 18 | 16,921 | 468 | 2,808 | 6.0 |
| | Totals | 26,812 | 553 | 5,622 | 4.8 |
| 1981 | June 10 | 11,897 | 489 | 2,934 | 4.1 |
| | June 16 | 17,985 | 541 | 3,246 | 5.5 |
| | Totals | 29,882 | 589 | 6,180 | 4.8 |
| 1982 | June 14 | 4,912 | 464 | 2,784 | 1.8 |
| | June 17 | 11,285 | 496 | 2,892 | 3.8 |
| | June 21 | 13,343 | 499 | 2,994 | 4.5 |
| | June 24 | 8,548 | 459 | 1,836 | 4.7 |
| | Totals | 38,088 | 610 | 10,502 | 3.6 |

Appendix Table 12. Associated Environmental and Catch Data, Kuskokwim River, 1965-1982.

| Year | Breakup at Bethel | at River Clear of Ice | First Reported King Salmon | First Reported Smelt | Freezeup at Bethel |
|------|-------------------|-----------------------|----------------------------|----------------------|--------------------|
| 1965 | 1/ | 1/ | May 31 | May 25 | 1/ |
| 1966 | June 1 | 1/ | June 1 (Kalskag) | June 6 | Oct. 20 |
| 1967 | May 6 | May 17 | May 20 | May 25 | Oct. 19 |
| 1968 | May 14 | May 17 | May 26 | 1/ | 1/ |
| 1969 | May 6 | May 13 | May 23 | 1/ | 1/ |
| 1970 | May 12 | May 16 | May 21 | May 27 | Oct. 18 |
| 1971 | May 24 | May 29 | June 6 | June 7 | Nov. 4 |
| 1972 | May 23 | May 28 | June 5 | June 6 | Nov. 3 |
| 1973 | May 14 | May 18 | May 27 | May 31 | Oct. 15 |
| 1974 | May 7 | May 19 | May 23 | May 25 | 1/ |
| 1975 | May 19 | May 25 | May 26 | May 29 | Oct. 29 |
| 1976 | May 18 | May 28 | June 1 | 1/ | Oct. 27 |
| 1977 | May 23 | June 1 | May 31 | June 2 | Oct. 18 |
| 1978 | 1/ | 1/ | May 18 | May 22 | Oct. 25 |
| 1979 | Apr 27 | May 7 | May 16 | 1/ | Nov. 19 |
| 1980 | May 4 | May 10 | May 17 | May 22 | 1/ |
| 1981 | May 9 | May 12 | May 22 | May 6 | Nov. - |
| 1982 | May 18 | May 22 | June 1 | June 3 | Oct. 30 |

1/ Data not available

Appendix Table 13. Utilization of Kuskokwim River chum salmon, 1960-1982. 3/

| Year | Commercial Catch 1/ | Subsistence Catch 2/ | Total Utilization |
|----------------------------|---------------------|----------------------|-------------------|
| 1960 | | 327,297 | 327,297 |
| 1961 | | 185,447 | 185,447 |
| 1962 | | 165,626 | 165,626 |
| 1963 | | 141,550 | 141,550 |
| 1964 | | 189,660 | 189,660 |
| 1965 | | 283,459 | 283,459 |
| 1966 | | 174,660 | 174,660 |
| 1967 | 148 | 205,263 | 205,411 |
| 1968 | 187 | 260,023 | 260,210 |
| 1969 | 7,165 | 198,268 | 205,433 |
| 1970 | 1,664 | 245,550 | 247,214 |
| 1971 | 68,914 | 116,391 | 185,305 |
| 1972 | 78,619 | 120,316 | 198,935 |
| 1973 | 143,746 | 179,259 | 323,005 |
| 1974 | 171,887 | 277,170 | 449,057 |
| 1975 | 181,840 | 176,389 | 358,229 |
| 1976 | 177,864 | 227,765 | 405,629 |
| 1977 | 248,721 | 213,418 | 462,139 |
| 1978 | 248,656 | 131,049 | 379,705 |
| 1979 | 261,874 | 160,836 | 422,710 |
| 1980 | 483,751 | 163,196 4/ | 646,947 |
| 1981 | 418,677 | 153,766 4/ | 572,443 |
| 1982 | 278,306 | 190,036 | 468,342 |
| Previous 5 Year Average | 332,336 | 164,453 | 496,789 |

1/ District 335-10 and 335-20

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

3/ Includes minimal numbers of red, pink and coho salmon.

4/ Does not include cohos that were accurately identified in the subsistence catches.

Appendix Table 14. Commercial chum salmon catches by fishing period during the chum salmon season, Kuskokwim River (District 1, 335-10), 1971-1982.

| Year | Date | Catch | Fishermen | Fishermen Hours | Catch/hr. |
|------|------------|---------|-----------|-----------------|-----------|
| 1971 | June 28-29 | 11,386 | 150 | 1,800 | 6.3 |
| | July 1-2 | 8,949 | 111 | 1,332 | 6.7 |
| | July 5-6 | 17,672 | 104 | 1,248 | 14.2 |
| | July 8-9 | 12,603 | 93 | 1,116 | 11.3 |
| | July 12-13 | 2,550 | 18 | 216 | 11.8 |
| | July 15-16 | 8,000 | 69 | 828 | 9.7 |
| | July 19-20 | 5,989 | 71 | 852 | 7.0 |
| | Totals | 67,149 | 216 | 7,392 | 9.1 |
| 1972 | June 29-30 | 9,863 | 87 | 1,044 | 9.4 |
| | July 3-4 | 19,084 | 115 | 1,380 | 13.8 |
| | July 6-7 | 19,839 | 101 | 1,212 | 16.4 |
| | July 10-11 | 13,972 | 113 | 1,356 | 10.3 |
| | July 13-14 | 6,290 | 80 | 960 | 6.6 |
| | Totals | 69,048 | 176 | 5,952 | 11.6 |
| 1973 | June 25-26 | 19,073 | 202 | 2,424 | 7.9 |
| | June 28-29 | 47,258 | 250 | 6,000 | 7.9 |
| | July 2-3 | 21,410 | 242 | 2,904 | 7.4 |
| | July 5-6 | 31,056 | 212 | 2,544 | 12.2 |
| | July 9-10 | 24,593 | 217 | 2,604 | 9.4 |
| | Totals | 143,390 | 341 | 16,476 | 8.7 |
| 1974 | June 2 | 27,017 | 267 | 1,602 | 16.9 |
| | July 1-2 | 55,356 | 380 | 4,560 | 12.1 |
| | July 4-5 | 27,211 | 282 | 3,384 | 8.0 |
| | July 8-9 | 50,672 | 376 | 4,512 | 11.2 |
| | July 1 | 6,661 | 190 | 1,140 | 5.8 |
| | Totals | 166,917 | 467 | 15,198 | 11.0 |
| 1975 | June 30 | 31,216 | 279 | 1,674 | 18.6 |
| | July 3 | 35,525 | 360 | 2,160 | 16.0 |
| | July 7 | 39,396 | 369 | 2,214 | 17.8 |
| | July 10 | 39,910 | 304 | 1,824 | 21.9 |
| | July 14 | 21,092 | 326 | 1,956 | 10.8 |
| | Totals | 167,139 | 539 | 9,828 | 17.0 |
| 1976 | June 28 | 42,464 | 348 | 2,088 | 20.3 |
| | July 1 | 44,024 | 415 | 2,490 | 17.7 |
| | July 8 | 48,669 | 381 | 2,286 | 21.3 |
| | July 12 | 21,153 | 377 | 2,262 | 9.4 |
| | July 15 | 14,176 | 265 | 1,590 | 8.9 |
| | Totals | 170,486 | 517 | 10,716 | 15.9 |

Appendix Table 14. (Continued)

| Year | Date | Catch | Fishermen | Fishermen Hours | Catch/hr. |
|--------|---------|---------|-----------|-----------------|-----------|
| 1977 | June 27 | 40,321 | 378 | 2,268 | 17.8 |
| | June 30 | 58,884 | 409 | 2,454 | 24.0 |
| | July 4 | 37,500 | 331 | 1,986 | 18.9 |
| | July 7 | 56,943 | 368 | 2,208 | 25.8 |
| | July 14 | 24,765 | 385 | 2,310 | 10.7 |
| | Totals | 218,413 | 522 | 11,226 | 19.5 |
| 1978 | June 26 | 44,296 | 449 | 2,694 | 16.4 |
| | June 29 | 36,793 | 442 | 2,652 | 13.9 |
| | July 3 | 26,629 | 476 | 2,856 | 9.3 |
| | July 6 | 48,031 | 485 | 5,820 | 8.3 |
| | July 10 | 48,931 | 428 | 5,136 | 9.5 |
| | July 13 | 14,935 | 422 | 2,532 | 5.9 |
| Totals | 219,615 | 617 | 21,690 | 10.1 | |
| 1979 | June 22 | 32,295 | 502 | 3,012 | 10.7 |
| | June 26 | 53,648 | 531 | 3,186 | 16.8 |
| | June 29 | 48,643 | 542 | 3,252 | 14.9 |
| | July 3 | 83,164 | 542 | 3,252 | 25.6 |
| | July 10 | 32,434 | 520 | 3,120 | 10.4 |
| | Totals | 250,184 | 617 | 15,822 | 15.8 |
| 1980 | June 23 | 105,825 | 436 | 2,616 | 40.5 |
| | June 26 | 131,945 | 408 | 2,448 | 53.9 |
| | July 2 | 122,613 | 383 | 2,298 | 53.4 |
| | July | 90,233 | 431 | 2,586 | 34.9 |
| | Totals | 450,616 | 579 | 9,948 | 45.2 |
| 1981 | June 22 | 78,168 | 511 | 3,066 | 25.5 |
| | June 25 | 81,431 | 508 | 3,048 | 26.7 |
| | June 30 | 51,942 | 484 | 2,904 | 17.9 |
| | July 2 | 58,594 | 459 | 2,754 | 21.3 |
| | July 6 | 55,799 | 461 | 2,766 | 20.2 |
| | July 9 | 66,138 | 440 | 2,640 | 25.0 |
| | Totals | 392,072 | 613 | 17,178 | 22.8 |
| 1982 | June 28 | 58,528 | 352 | 1,408 | 41.6 |
| | June 30 | 47,773 | 483 | 1,932 | 24.7 |
| | July 2 | 38,918 | 434 | 1,736 | 22.4 |
| | July 5 | 29,315 | 372 | 2,232 | 13.1 |
| | July 8 | 28,942 | 435 | 2,610 | 11.9 |
| | July 12 | 20,709 | 354 | 2,124 | 9.8 |
| | Totals | 224,185 | 576 | 12,042 | 18.6 |

Appendix Table 15. Commercial coho salmon catches by week, lower Kuskokwim River (District 1, 335-10), 1974-1981.

| Year | Date | Catch | Fishermen | Fishermen Hours | Catch/Hr. |
|--------|-----------|---------|-----------|--------------------|-----------|
| 1974 | Aug 1-2 | 9,576 | 267 | 3,444 | 2.8 |
| | Aug 5-8 | 59,090 | 444 | 31,968 | 1.9 |
| | Aug 12-15 | 58,066 | 396 | 28,512 | 2.0 |
| | Aug 19-22 | 12,301 | 263 | 18,936 | 0.6 |
| | Aug 26-29 | 5,360 | 107 | 7,704 | 0.7 |
| | Sept 2-5 | 430 | 25 | 1,815 | 0.2 |
| | Totals | 144,823 | 516 | 92,379 | 1.6 |
| 1975 | Aug 1 | 2,357 | 142 | 852 | 2.8 |
| | Aug 4-6 | 12,500 | 292 | 14,016 | 0.9 |
| | Aug 11-13 | 18,551 | 373 | 17,904 | 1.0 |
| | Aug 18-20 | 34,435 | 388 | 18,624 | 1.9 |
| | Aug 25-27 | 16,277 | 270 | 12,960 | 1.3 |
| Totals | 84,120 | 531 | 64,356 | 1.3 | |
| 1976 | Aug 2-3 | 10,534 | 286 | 6,864 | 1.5 |
| | Aug 9-11 | 29,728 | 400 | 19,200 | 1.5 |
| | Aug 16-18 | 28,664 | 387 | 18,576 | 1.5 |
| | Aug 23-25 | 14,543 | 300 | 14,400 | 1.0 |
| | Aug 30-31 | 4,420 | 174 | 7,308 | 0.6 |
| Totals | 87,889 | 516 | 66,348 | 1.3 | |
| 1977 | Aug 1-7 | 23,987 | 360 | 8,640 | 2.8 |
| | Aug 8-10 | 91,474 | 487 | 23,376 | 3.9 |
| | Aug 12-21 | 60,935 | 438 | 10,512 | 5.8 |
| | Aug 18 | 25,589 | 378 | 4,536 | 5.6 |
| | Aug 22 | 16,980 | 361 | 4,332 | 3.9 |
| | Aug 25 | 11,874 | 264 | 3,168 | 3.8 |
| | Aug 27 | 6,819 | 204 | 2,448 | 2.8 |
| Totals | 237,658 | 572 | 57,012 | 4.2 | |
| 1978 | Aug 1 | 6,311 | 297 | 3,564 | 1.7 |
| | Aug 4 | 9,455 | 364 | 4,368 | 2.2 |
| | Aug 8 | 20,501 | 433 | 5,196 | 5.5 |
| | Aug 11 | 42,428 | 485 | 5,820 | 7.3 |
| | Aug 15 | 48,950 | 476 | 5,712 | 8.6 |
| | Aug 18 | 29,485 | 434 | 5,208 | 5.7 |
| | Aug 22 | 22,287 | 396 | 4,752 | 4.7 |
| | Aug 25 | 11,168 | 293 | 3,516 | 3.2 |
| | Aug 29 | 12,215 | 250 | 3,000 | 4.1 |
| Totals | 210,790 | 597 | 41,136 | 5.2 | |

Appendix Table 15. (Continued)

| Year | Date | Catch | Fishermen | Fishermen Hours | Catch/Hr. |
|------|---------|---------|-----------|-----------------|-----------|
| 1979 | Aug 2 | 52,276 | 478 | 5,736 | 9.1 |
| | Aug 6 | 53,797 | 480 | 2,880 | 18.7 |
| | Aug 9 | 26,422 | 497 | 2,982 | 8.9 |
| | Aug 13 | 27,915 | 463 | 2,778 | 10.1 |
| | Aug 16 | 21,675 | 467 | 2,802 | 7.7 |
| | Aug 20 | 19,445 | 390 | 2,340 | 8.3 |
| | Aug 23 | 5,376 | 328 | 1,968 | 2.7 |
| | Aug 27 | 6,342 | 310 | 3,720 | 1.7 |
| | Aug 30 | 2,182 | 179 | 2,148 | 1.0 |
| | Totals | 215,430 | 613 | 27,354 | 7.9 |
| 1980 | Aug 2 | 9,889 | 375 | 2,250 | 4.4 |
| | Aug 7 | 36,126 | 455 | 2,730 | 13.2 |
| | Aug 11 | 35,178 | 482 | 2,892 | 12.2 |
| | Aug 14 | 28,211 | 439 | 2,634 | 10.7 |
| | Aug 18 | 43,748 | 441 | 2,646 | 16.5 |
| | Aug 21 | 33,274 | 419 | 2,514 | 13.2 |
| | Aug 25 | 19,264 | 370 | 2,220 | 8.7 |
| | Aug 28 | 13,484 | 319 | 1,914 | 7.0 |
| | Totals | 219,174 | 586 | 19,800 | 11.1 |
| 1981 | Aug 3 | 16,184 | 430 | 2,580 | 6.3 |
| | Aug 6 | 13,885 | 441 | 2,646 | 5.3 |
| | Aug 10 | 26,972 | 445 | 2,670 | 10.1 |
| | Aug 13 | 46,252 | 473 | 2,838 | 16.6 |
| | Aug 17 | 34,739 | 458 | 2,748 | 12.6 |
| | Aug 20 | 24,184 | 380 | 2,280 | 10.6 |
| | Aug 24 | 23,771 | 372 | 2,232 | 10.6 |
| | Aug 27 | 13,785 | 346 | 2,076 | 6.6 |
| | Aug 31 | 8,096 | 278 | 1,668 | 4.8 |
| | Totals | 207,868 | 586 | 21,738 | 9.6 |
| 1982 | July 29 | 19,561 | 416 | 2,496 | 7.8 |
| | Aug 2 | 31,944 | 388 | 2,328 | 13.7 |
| | Aug 5 | 35,766 | 455 | 2,670 | 13.4 |
| | Aug 9 | 61,231 | 442 | 2,652 | 23.1 |
| | Aug 12 | 80,685 | 449 | 2,694 | 30.0 |
| | Aug 16 | 77,785 | 420 | 2,520 | 30.9 |
| | Aug 19 | 49,566 | 403 | 2,418 | 20.5 |
| | Aug 23 | 25,218 | 349 | 2,094 | 12.0 |
| | Aug 26 | 26,761 | 314 | 1,884 | 14.2 |
| | Aug 30 | 26,815 | 302 | 1,812 | 14.8 |
| | Totals | 435,332 | 597 | 23,568 | 18.5 |

Appendix Table 16. Kuskokwim River subsistence king salmon catches by village, 1960-1982.

| Village | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 |
|--|----------|----------|----------|----------|--------|--------|--------|--------|--------|--------|--------|
| Kwigillingok, Kipnuk, Kongiganak | 250 | 283 | 54 | 229 | 414 | 0 1/ | 205 | 957 | 70 | 385 | 1,111 |
| Ek | 1,474 3/ | 2,238 3/ | 1,060 3/ | 2,697 3/ | 1,857 | 2,872 | 2,872 | 4,375 | 2,760 | 2,037 | 2,065 |
| Puntutuliak | 226 | 2,226 | 842 | 2,853 | 1,826 | 1,978 | 3,061 | 3,338 | 2,026 | 2,195 | 3,558 |
| Kasigluk | 135 | 1,215 | 127 | 1,302 | 4/ | 513 | 1,875 | 2,766 | 1,360 | 2,888 | 3,931 |
| Nunapitchuk | 683 | 2,042 | 848 | 1,874 | 636 | 490 | 2,875 | 1,926 | 1,360 | 2,279 | 4,680 |
| Atmauthluak 6/ | | | | | | | | | | | 1,205 |
| Napakiak | 1,830 | 2,573 | 2,191 | 3,148 | 2,677 | 1,670 | 3,592 | 3,922 | 2,317 | 3,546 | 4,960 |
| Oscarville | 1,968 | 282 | 75 | 309 | 339 | 678 | 301 | 1,327 | 393 | 457 | 542 |
| Napaskiak | 536 | 1,258 | 759 | 1,569 | 2,201 | 1,412 | 2,935 | 3,091 | 1,647 | 2,227 | 3,446 |
| Bethel | 1,923 | 4,150 | 1,378 | 7,019 | 4,114 | 3,342 | 7,604 | 11,772 | 4,900 | 7,472 | 17,026 |
| Kwethluk | 2,692 | 3,763 | 2,329 | 5,050 | 3,262 | 4,538 | 6,135 | 6,889 | 3,549 | 3,187 | 7,932 |
| Akiakchak | 1,626 | 3,052 | 1,800 | 2,533 | 3,488 | 3,952 | 4,957 | 5,543 | 3,415 | 2,602 | 7,022 |
| Akiak | 1,865 | 3,159 | 906 | 2,869 | 2,495 | 1,774 | 3,941 | 3,790 | 1,332 | 1,275 | 3,290 |
| Tuluksak | 737 | 1,486 | 493 | 1,295 | 572 | 1,019 | 1,559 | 1,710 | 1,048 | 1,131 | 1,995 |
| Lower Kalskag | 961 | 571 | 805 | 2,661 | 710 | 841 | 1,918 | 1,733 | 1,463 | 2,083 | 2,146 |
| Upper Kalskag | 667 | 1,049 | 7/ | 7/ | 1,143 | 719 | 1,333 | 1,699 | 1,404 | 1,623 | 734 |
| Aniak | 1,057 | 688 | 185 | 602 | 1,104 | 494 | 2,002 | 1,415 | 467 | 1,406 | 2,136 |
| Chuathbaluk | 64 | 54 | 10 | 30 | 74 | 29 | 139 | 217 | 40 | 180 | 219 |
| Napamute | 20 | 16 | 44 | 52 | 134 | 2 | 78 | 60 | 100 | 19 | 22 |
| Crooked Creek | 747 | 518 | 561 | 859 | 1,358 | 363 | 1,249 | 638 | 77 | 541 | 684 |
| Georgetown | 10/ | 10/ | 10/ | 10/ | 10/ | 10/ | 12 | 10/ | 10/ | 9 | 2 |
| Red Devil | 10/ | 40 | 144 | 228 | 314 | 10/ | 182 | 10/ | 111 | 142 | 232 |
| Sleetmute | 465 | 222 | 9/ | 9/ | 9/ | 491 | 149 | 343 | 200 | 267 | 161 |
| Stony River | 435 | 25 | 31 | 67 | 299 | 101 | 632 | 364 | 191 | 2,187 | 105 |
| Totals | 20,361 | 30,910 | 14,642 | 37,246 | 29,017 | 27,143 | 49,606 | 57,875 | 30,230 | 40,138 | 69,204 |

Appendix Table 16. (Continued)

| Village | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | Pre. 5 Year Ave. |
|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------------------|
| Kwigillingok, | | | | | | | | | | | | | |
| Klgnuk, | | | | | | | | | | | | | |
| Kongiganak | 241 | 10 | 75 | 10/ | 10/ | 197 | 743 | 75 | 0 | 0 | 0 | 112 | 164 |
| Eek | 1,822 | 1,969 | 1,981 | 2,356 | 2,110 | 3,232 | 2,675 | 1,807 | 2,003 | 1,557 | 1,731 | 2,578 | 1,955 |
| Tuntutuliak | 1,841 | 3,214 | 2,859 | 1,577 | 3,492 | 4,807 | 2,470 | 1,656 | 2,268 | 2,545 | 4,466 | 1,984 | 2,681 |
| Kasiqluk | 1,645 | 1,292 | 8,864 | 1,411 | 1,713 | 1,613 | 1,324 | 608 | 1,142 | 1,704 | 3,377 | 3,115 | 1,631 |
| Nunapitchuk | 1,970 | 2,496 | 2,663 | 1,165 | 2,092 | 2,578 | 2,622 | 2,178 | 2,109 | 2,612 | 2,918 | 2,577 | 2,488 |
| Atmauthluak 6/ | 548 | 864 | 1,106 | 382 | 1,042 | 1,169 | 1,015 | 966 | 2,242 | 1,288 | 1,247 | 1,752 | 1,352 |
| Napakiak | 1,868 | 2,009 | 1,763 | 1,224 | 2,864 | 3,330 | 2,702 | 2,140 | 2,191 | 2,582 | 3,017 | 3,500 | 2,526 |
| Oscarville | 570 | 196 | 586 | 180 | 891 | 623 | 672 | 349 | 629 | 477 | 492 | 523 | 524 |
| Napaskiak | 1,916 | 1,578 | 2,048 | 900 | 2,303 | 3,566 | 1,989 | 2,122 | 2,085 | 3,160 | 2,911 | 2,872 | 2,453 |
| Bethel | 8,731 | 8,371 | 8,898 | 4,631 | 11,688 | 13,215 | 9,408 | 6,905 | 11,564 | 12,591 | 15,367 | 13,516 | 11,167 |
| Kwethluk | 5,564 | 5,137 | 3,444 | 2,694 | 3,179 | 4,193 | 5,563 | 3,172 | 6,919 | 7,627 | 6,167 | 5,897 | 5,890 |
| Akiakchak | 4,818 | 3,872 | 3,592 | 1,726 | 3,534 | 4,915 | 5,407 | 2,951 | 4,818 | 5,405 | 3,094 | 4,468 | 4,335 |
| Akiak | 2,688 | 1,899 | 1,895 | 1,292 | 2,837 | 3,076 | 2,880 | 1,850 | 3,567 | 3,355 | 2,380 | 2,745 | 2,806 |
| Tuluksak | 1,280 | 1,318 | 1,322 | 883 | 1,338 | 1,411 | 2,906 | 1,906 | 1,489 | 2,807 | 2,446 | 2,220 | 2,311 |
| Lower Kalskag | 2,355 | 2,604 | 1,309 | 1,586 | 2,755 | 4,536 | 1,750 | 1,951 | 2,821 | 3,917 | 3,271 | 2,594 | 2,742 |
| Upper Kalskag | 601 | 401 | 938 | 463 | 1,752 | 1,431 | 2,813 | 1,253 | 1,590 | 1,889 | 1,171 | 963 | 1,743 |
| Ahiak | 1,076 | 2,105 | 1,030 | 1,952 | 1,391 | 1,490 | 4,991 | 1,331 | 2,634 | 2,750 | 3,102 | 2,071 | 2,962 |
| Chuathbaluk | 179 | 261 | 942 | 674 | 594 | 657 | 1,507 | 1,238 | 2,189 | 1,507 | 841 | 1,491 | 1,456 |
| Napamute | 17 | 20 | 13 | 6 | 16 | 420 | 176 | 144 | 149 | 90 | 45 | 138 | 121 |
| Crooked Creek | 291 | 183 | 269 | 650 | 238 | 264 | 619 | 488 | 728 | 654 | 512 | 515 | 600 |
| Georgetown | 0 | 0 | 0 | 9/ | 0 | 0 | 66 | 0 | 0 | 93 | 9/ | - | 32 |
| Red Devil | 135 | 182 | 138 | 205 | 623 | 195 | 324 | 153 | 488 | 255 | 298 | 273 | 304 |
| Sleetmute | 181 | 69 | 504 | 269 | 256 | 356 | 684 | 456 | 988 | 427 | 728 | 242 | 617 |
| Stony River | 2,521 | 11/ 95 | 287 | 439 | 861 | 653 | 11/ 33 | 182 | 171 | 332 | 233 | 419 | 190 |
| Totals | 42,926 | 40,145 | 38,526 | 26,665 | 47,569 | 57,917 | 55,339 | 35,991 | 54,708 | 59,509 | 59,669 | 56,565 | 53,058 |

- 1/ Included with other villages.
- 2/ Does not include 1965.
- 3/ Estimates based on catch data through 1969.
- 4/ Included with Eek.
- 5/ Does not include 1964.
- 6/ New village of Atmauthluak segregated in 1970 from parent village of Nunapitchuk.
- 7/ Included with Lower Kalskag.
- 8/ Does not include 1962 and 1963.
- 9/ Included with Red Devil.
- 10/ Data not available.
- 11/ Includes Lime Village.

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Appendix Table 16. (Continued)

| Village | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | |
|----------------|-----------|--------|--------|--------|--------|---------|----|
| Kwigillingok, | | | | | | | |
| Kipnuk, | | | | | | | |
| Kongiganak | 241 | 10 | 75 | 10/ | 10/ | 197 | |
| Eek | 1,822 | 1,969 | 1,981 | 2,356 | 2,110 | 3,232 | 2 |
| Tuntutuliak | 1,841 | 3,214 | 2,859 | 1,577 | 3,492 | 4,807 | 2 |
| Kasigluk | 1,645 | 1,292 | 8,864 | 1,411 | 1,713 | 1,613 | 1 |
| Nunapitchuk | 1,970 | 2,496 | 2,663 | 1,165 | 2,092 | 2,578 | 2 |
| Atmauthluak 6/ | 548 | 864 | 1,106 | 382 | 1,042 | 1,169 | 1 |
| Napakiak | 1,868 | 2,009 | 1,763 | 1,224 | 2,864 | 3,330 | 2 |
| Oscarville | 570 | 196 | 586 | 180 | 891 | 623 | |
| Napaskiak | 1,916 | 1,578 | 2,048 | 900 | 2,303 | 3,566 | 1 |
| Bethel | 8,731 | 8,371 | 8,898 | 4,631 | 11,688 | 13,215 | 9 |
| Kwethluk | 5,564 | 5,137 | 3,444 | 2,694 | 3,179 | 4,193 | 5 |
| Akiakchak | 4,818 | 3,872 | 2,592 | 1,726 | 3,534 | 4,915 | 5 |
| Akiak | 2,688 | 1,899 | 1,895 | 1,292 | 2,837 | 3,076 | 2 |
| Tuluksak | 1,280 | 1,318 | 1,322 | 883 | 1,338 | 1,411 | 2 |
| Lower Kalskag | 2,355 | 2,604 | 1,309 | 1,586 | 2,755 | 4,536 | 1 |
| Upper Kalskag | 601 | 401 | 938 | 463 | 1,752 | 1,431 | 2 |
| Aniak | 1,076 | 2,105 | 1,030 | 1,952 | 1,391 | 1,490 | 4 |
| Chuathbaluk | 179 | 261 | 942 | 674 | 594 | 657 | 1 |
| Napamute | 17 | 20 | 13 | 6 | 16 | 420 | |
| Crooked Creek | 291 | 183 | 269 | 650 | 238 | 264 | |
| Georgetown | 0 | 0 | 0 | 9/ | 0 | 0 | |
| Red Devil | 135 | 182 | 138 | 205 | 623 | 195 | |
| Sleetmute | 181 | 69 | 504 | 269 | 256 | 356 | |
| Stony River | 2,521 11/ | 95 | 287 | 439 | 861 | 653 11/ | |
| Totals | 42,926 | 40,145 | 38,526 | 26,665 | 47,569 | 57,917 | 55 |

1/ Included with other villages.

2/ Does not include 1965.

3/ Estimates based on catch data through 1969.

4/ Included with Eek.

5/ Does not include 1964.

6/ New village of Atmauthluak segregated in 1970 from parent village of Nunapitchuk.

7/ Included with Lower Kalskag.

8/ Does not include 1962 and 1963.

9/ Included with Red Devil.

10/ Data not available.

11/ Includes Lime Village.

Appendix Table 17. Kuskokwim River "other salmon" subsistence catches by village, 1960-1973.

| Village | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 | 1972 | 1973 |
|---|---------|----------|---------|----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Kipnuk, Kongiganak and Kwigillingok | 1,430 | 3,279 | 1,990 | 2,562 | 2,323 | 0 | 680 | 2,846 | 2,800 | 2,481 | 3,937 | 1,110 | 1,284 | 807 |
| Eek | 4,094 | 2,321 3/ | 2,072 | 1,771 3/ | 3,151 | 2,898 | 1,324 | 1,922 | 3,503 | 3,436 | 4,855 | 2,213 | 783 | 2,401 |
| Tuntutuliak | 4,101 | 8,526 | 9,692 | 6,791 | 8,421 | 18,993 | 9,747 | 11,531 | 14,090 | 17,462 | 10,600 | 9,964 | 11,103 | 13,572 |
| Kasigluk | 1,400 | 3,657 | 1,705 | 1,020 | 4/ | 4,041 | 3,058 | 2,309 | 4,311 | 3,308 | 5,731 | 2,043 | 1,934 | 6,090 |
| Nunapitchuk | 2,743 | 4,868 | 7,474 | 2,462 | 1,171 | 4,251 | 4,145 | 6,278 | 7,731 | 6,934 | 11,412 | 3,375 | 5,600 | 7,663 |
| Atmauthluak | | | | | | | | | | 1,191 | 1,197 | 947 | 2,818 | |
| Hapakiak | 19,888 | 5,789 | 6,167 | 3,711 | 12,312 | 12,928 | 9,275 | 12,685 | 12,700 | 12,390 | 16,371 | 4,427 | 5,191 | 8,461 |
| Oscarville | 3,948 | 1,680 | 1,723 | 1,025 | 487 | 8,010 | 407 | 2,580 | 2,104 | 2,743 | 4,669 | 1,675 | 498 | 3,081 |
| Napaskiak | 5,199 | 4,286 | 5,546 | 3,584 | 6,275 | 26,206 | 8,743 | 8,585 | 12,409 | 11,655 | 11,169 | 7,039 | 8,858 | 8,478 |
| Bethel | 12,972 | 12,845 | 8,470 | 8,623 | 15,623 | 19,009 | 14,011 | 14,055 | 28,603 | 14,613 | 33,475 | 9,905 | 16,885 | 33,930 |
| Kwethluk | 32,975 | 21,106 | 22,788 | 13,180 | 19,186 | 37,780 | 18,707 | 23,872 | 36,645 | 23,462 | 27,702 | 13,941 | 11,721 | 19,565 |
| Akiakchak | 15,932 | 12,518 | 10,521 | 6,725 | 10,096 | 25,138 | 15,049 | 13,584 | 19,461 | 10,306 | 29,776 | 12,298 | 9,266 | 9,864 |
| Akiak | 13,601 | 8,205 | 6,551 | 8,478 | 9,659 | 12,297 | 10,622 | 9,332 | 13,775 | 9,854 | 13,003 | 9,264 | 5,108 | 6,118 |
| Tulusak | 19,261 | 7,928 | 8,526 | 10,289 | 9,777 | 12,820 | 11,670 | 8,898 | 11,114 | 6,058 | 7,626 | 6,115 | 5,145 | 5,946 |
| Lower Kalskag | 11,563 | 7,764 | 16,478 | 23,249 | 9,472 | 21,906 | 10,346 | 16,018 | 8,114 | 8,468 | 11,158 | 3,509 | 3,490 | 2,873 |
| Upper Kalskag | 38,938 | 27,149 | 5/ | 5/ | 11,391 | 11,970 | 6,236 | 8,364 | 9,733 | 9,413 | 5,309 | 3,530 | 1,460 | 5,607 |
| Aniak | 36,673 | 15,935 | 10,120 | 10,608 | 17,874 | 11,353 | 12,484 | 16,788 | 17,341 | 15,127 | 10,030 | 4,933 | 5,243 | 13,547 |
| Chuathbaluk | 22,370 | 2,922 | 3,784 | 2,629 | 5,059 | 6,507 | 5,625 | 7,249 | 11,588 | 7,523 | 10,971 | 5,632 | 8,509 | 14,171 |
| Rapamute | 11,017 | 6,235 | 3,898 | 5,192 | 4,873 | 704 | 3,704 | 5,750 | 1,774 | 1,453 | 1,224 | 1,862 | 4,465 | 3,451 |
| Crooked Creek | 41,263 | 17,558 | 27,259 | 23,166 | 32,550 | 18,986 | 19,467 | 14,365 | 12,704 | 6,810 | 9,216 | 3,094 | 3,658 | 1,981 |
| Georgetwon | 6/ | 6/ | 6/ | 6/ | 6/ | 6/ | 70 | 6/ | 2,030 | 3,664 | 800 | 0 | 0 | 10 |
| Red Devil | 6/ | 1,358 | 9,007 | 5,637 | 5,706 | 6/ | 2,746 | 6/ | 2,400 | 1,130 | 2,454 | 1,067 | 1,695 | 2,782 |
| Sleetmute | 7,259 | 6,884 | 7/ | 7/ | 7/ | 11,707 | 2,611 | 6,875 | 11,218 | 8,258 | 4,464 | 3,203 | 4,293 | 2,160 |
| Stony River | 11,750 | 2,642 | 1,855 | 1,110 | 4,254 | 15,865 | 3,933 | 11,377 | 13,875 | 12,080 | 8,407 | 5,995 | 3,000 | 3,875 |
| Totals | 327,297 | 185,447 | 165,626 | 141,550 | 189,660 | 283,459 | 174,660 | 205,263 | 260,023 | 198,268 | 245,550 | 116,391 | 120,316 | 179,259 |

Appendix Table 17. (Continued).

| Village | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | Average |
|---|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Kongiganak, Kipnuk and Kwigillingok | 9/ | 9/ | 902 | 2,190 | 78 | 0 | 0 | 0 | 486 | 454 |
| Eek | 4,227 | 2,754 | 4,425 | 3,251 | 1,874 | 1,125 | 2,177 | 1,517 | 1,012 | 1,989 |
| Tuntutuliak | 28,321 | 7,429 | 8,440 | 9,340 | 5,564 | 5,632 | 8,961 | 5,943 | 8,500 | 7,088 |
| Kasigluk | 6,773 | 3,708 | 4,050 | 3,504 | 1,242 | 2,617 | 5,684 | 3,144 | 6,876 | 3,238 |
| Nunapitchuk | 12,498 | 5,447 | 6,551 | 8,991 | 4,977 | 5,737 | 6,626 | 5,501 | 8,646 | 6,366 |
| Atmauthluak | 4,585 | 2,524 | 3,446 | 3,693 | 3,860 | 5,287 | 4,794 | 3,856 | 4,787 | 4,298 |
| Napakiaik | 21,494 | 11,630 | 9,477 | 8,420 | 6,074 | 8,019 | 8,123 | 7,099 | 8,618 | 7,547 |
| Oscarville | 5,617 | 3,237 | 2,416 | 2,030 | 1,276 | 969 | 1,395 | 1,260 | 1,665 | 1,386 |
| Napaskiak | 20,467 | 12,930 | 21,518 | 11,588 | 9,286 | 5,773 | 7,391 | 7,653 | 10,139 | 8,388 |
| Bethel | 34,892 | 26,808 | 26,970 | 15,982 | 13,731 | 31,040 | 33,198 | 42,798 | 37,857 | 27,350 |
| Kwethluk | 39,747 | 19,183 | 27,120 | 28,193 | 14,038 | 16,861 | 24,564 | 11,506 | 16,837 | 19,032 |
| Akiachak | 15,108 | 14,008 | 16,050 | 18,607 | 9,445 | 10,459 | 15,172 | 6,533 | 13,803 | 12,043 |
| Akiak | 18,434 | 18,890 | 12,337 | 13,952 | 9,237 | 12,218 | 10,596 | 11,718 | 9,339 | 11,544 |
| Tuluksak | 13,261 | 7,819 | 11,833 | 7,835 | 4,478 | 5,249 | 9,963 | 6,763 | 5,040 | 6,858 |
| Lower Kalskag | 12,265 | 9,823 | 17,169 | 8,964 | 3,704 | 9,134 | 8,903 | 4,625 | 6,925 | 3,458 |
| Upper Kalskag | 9,631 | 6,904 | 8,694 | 11,845 | 7,279 | 6,117 | 6,932 | 6,916 | 5,362 | 7,818 |
| Aniak | 9,305 | 9,597 | 13,507 | 21,610 | 8,042 | 15,247 | 14,067 | 13,494 | 14,946 | 14,492 |
| Chuathbaluk | 4,287 | 561 | 7,967 | 5,141 | 4,885 | 6,646 | 4,148 | 8,567 | 6,952 | 5,877 |
| Napamute | 76 | 226 | 1,653 | 4,969 | 1,887 | 2,103 | 3,049 | 740 | 2,392 | 2,550 |
| Crooked Creek | 4,954 | 2,461 | 3,236 | 3,072 | 2,469 | 3,141 | 7,165 | 7,985 | 3,622 | 4,766 |
| Georgetown | 9/ | 9/ | 9/ | 1,127 | 9/ | 0 | 1,042 | 7/ | - | 434 |
| Red Devil | 2,688 | 4,491 | 4,231 | 5,916 | 6,161 | 8,286 | 5,133 | 6,183 | 7,380 | 6,336 |
| Sleetmute | 4,212 | 5,761 | 7,628 | 6,674 | 7,917 | 8,262 | 10,934 | 9,805 | 2,936 | 8,718 |
| Stony River | 4,328 | 5,202 | 8,484 | 8/ 3,300 | 3,545 | 3,355 | 2,967 | 2,303 | 2,198 | 3,094 |
| TOTALS | 277,170 | 176,389 | 228,104 | 210,194 | 131,049 | 149,147 | 202,714 | 174,716 | 185,598 | 173,564 |

1/ Catches include a majority of chum salmon but include small numbers of red, coho, pink and small king salmon.

2/ 1965 to 1972 catches do not include late coho salmon catches.

3/ Estimate based on catch data through 1970.

4/ Included with Eek.

5/ Included with Lower Kalskag.

Appendix Table 19. Quinhagak Subsistence Fishery Historical Summary, 1967-1982. 1/

| Year | Fishing Families Surveyed | Average Numbers per Fishing Family | | | | |
|------|---------------------------|------------------------------------|------|-------------|---------------|----------------|
| | | People | Dogs | King Salmon | "Chum" Salmon | Coho 3/ Salmon |
| 1967 | 19 | 6.43 | 4.00 | 71 | 231 | 2/ |
| 1968 | 46 | 5.59 | 4.07 | 88 | 234 | 380 |
| 1969 | 59 | 5.38 | 3.41 | 27 | 29 | 179 |
| 1970 | 46 | 6.02 | 2.76 | 47 | 110 | 2/ |
| 1971 | 41 | 5.83 | 2.37 | 55 | 87 | 36 |
| 1972 | 54 | 6.41 | 2.30 | 56 | 116 | 9 |
| 1973 | 44 | 5.80 | 2.07 | 61 | 98 | 83 |
| 1974 | 47 | 5.53 | 2.31 | 46 | 78 | 87 |
| 1975 | 46 | 5.86 | 1.85 | 71 | 88 | 2/ |
| 1976 | 50 | 5.62 | 2.20 | 44 | 119 | 2/ |
| 1977 | 60 | 6.63 | 1.59 | 34 | 70 | 2/ |
| 1978 | 65 | 5.59 | 1.86 | 36 | 96 | 3 |
| 1979 | 48 | 5.23 | 1.72 | 29 | 24 | 37 |
| 1980 | 76 | 5.21 | 1.38 | 26 | 26 | 69 |
| 1981 | 59 | 5.45 | 2.08 | 43 | 46 | 96 |
| 1982 | 52 | 5.19 | 3.10 | 36 | 33 | 13 |

- 1/ Expanded data.
 2/ Data unavailable.
 3/ Poor data base.

Appendix Table 20. Aerial salmon escapement index counts, Kuskokwim River drainage, 1960-1982. 1/

| Year | Index Count 2/ | | | Area Surveyed | Rating |
|------------------------|----------------|---------|---------|--------------------------------|--------|
| | King | Chum | Red | | |
| <u>Goodnews River</u> | | | | | |
| 1960 | 2,503 | 8,500 | 300 | Entire 3/ | Fair |
| 1961 | 1,780 | 2,325 | 900 | Entire | Fair |
| 1968 | 1,790 | 36,100 | - | Entire | Fair |
| 1975 | 82 | 1,090 | 3,335 | Mouth to Ningum Creek | Fair |
| 1976 | 1,150 | 16,900 | 5,940 | Mouth to Slate Creek | Good |
| 1977 | 2,163 | 15,993 | 4,271 | Mouth to Goodnews Lake | Good |
| 1979 | 635 | 8,349 | 987 | Mouth to Goodnews Lake | Fair |
| 1980 | 1,228 | 1,975 | 30,239 | Mouth to Goodnews Lake | Fair |
| 1982 | 1,990 | 9,700 | 19,160 | Entire | Good |
| <u>Kanektok River</u> | | | | | |
| 1960 | 6,047 | 36,100 | 34,900 | Entire | Fair |
| 1962 | 935 | - | 43,108 | Entire | Fair |
| 1966 | 3,718 | 28,800 | - | Entire | Fair |
| 1968 | 4,170 | 69,760 | 8,000 | Entire | Fair |
| 1970 | 3,112 | 69,000 | 1,900 | Lake to Mile 20 | Fair |
| 1976 | 3,079 | 6,197 | 2,936 | Entire | Fair |
| 1977 | 5,787 | 32,157 | 6,304 | Entire | Fair |
| 1978 | 19,180 | 229,290 | 44,215 | Entire | Fair |
| 1980 | 6,172 | 25,950 | 113,931 | Entire | Good |
| 1981 | 15,900 | 66,849 | 49,175 | Entire | Fair |
| 1982 | 8,142 | 8,820 | 55,950 | Entire | Fair |
| <u>Kwethluk River</u> | | | | | |
| 1960 | 1,320 | 1,300 | - | Upper 40 Miles | Fair |
| 1966 | 516 | 1,300 | - | Upper 35 Miles | Fair |
| 1968 | 800 | 3,900 | - | Entire | Fair |
| 1976 | 997 | 7,576 | - | Devil's Elbow to Canyon Creek | Fair |
| 1977 | 1,999 | 19,621 | - | 3 Step Mt. to Canyon Creek | Fair |
| 1978 | 1,722 | 3,220 | - | 3 Step Mt. to Canyon Creek | Fair |
| 1979 | 822 | 4,739 | - | 3 Step Mt. to Canyon Creek | Fair |
| 1981 | 2,034 | 5,496 | - | Entire | Fair |
| <u>Kisaralik River</u> | | | | | |
| 1960 | 1,104 | 2,300 | - | Entire | Fair |
| 1968 | 487 | 5,800 | - | Upper River | Fair |
| 1970 | 531 | 4,410 | - | Airstrip to Quicksilver Creek | Fair |
| 1973 | 873 | 10,921 | - | Airstrip to 1 Mile Above Falls | Fair |
| 1976 | 2,417 | 2,100 | 20 | Airstrip to Lake | Fair |
| 1981 | 940 | 7,508 | - | Entire | Fair |
| 1982 | 81 | 40 | - | Entire | Fair |

Appendix Table 20. (Continued)

| Year | Index Count 2/ | | | Area Surveyed | Rating |
|-----------------------------|----------------|---------|-------|---------------------------|--------|
| | King | Chum | Red | | |
| <u>Aniak River</u> | | | | | |
| 1960 | 1,881 | 35,900 | - | Entire 3/ | Fair |
| 1961 | 497 | 352 | - | Entire | Fair |
| 1962 | 925 | 36,253 | - | Entire | Fair |
| 1966 | 2,184 | 5,681 | - | Buckstock to Lake | Fair |
| 1968 | 2,203 | 128,390 | - | Buckstock to Kipchuk | Fair |
| 1970 | 1,231 | 17,575 | - | Buckstock to Waterbot | Fair |
| 1975 | 202 | 12,025 | 125 | Entire | Fair |
| 1976 | 281 | 8,385 | - | Kipchuk to Gemuk Mountain | Fair |
| 1981 | 10,094 | 97,275 | - | Entire | Fair |
| 1982 | 2,210 | 31,990 | 20 | Entire | Fair |
| <u>Salmon River (Aniak)</u> | | | | | |
| 1960 | 223 | 50 | - | Entire | Good |
| 1970 | 381 | 3,505 | - | Lower 25 miles | Fair |
| 1974 | 35 | 312 | - | Entire | Good |
| 1975 | 32 | 1,620 | - | Entire | Fair |
| 1977 | 520 | 625 | - | Mouth to Marvel | Fair |
| 1978 | 322 | 330 | - | Entire | Fair |
| 1980 | 1,186 | 14,815 | - | Mouth to Cripple | Fair |
| 1981 | 828 | 2,380 | - | Entire | Fair |
| 1982 | 126 | 175 | 30 | Entire | Fair |
| <u>Kipchuk River</u> | | | | | |
| 1960 | 513 | 70 | - | Entire | Good |
| 1966 | 491 | 3,132 | - | Lower 22 Miles | Good |
| 1967 | 319 | 3,000 | - | Entire | Fair |
| 1970 | 821 | 5,807 | - | Mouth to Bulldog | Fair |
| 1974 | 75 | 45 | - | Entire | Good |
| 1975 | 94 | 905 | - | Entire | Fair |
| 1976 | 177 | 1,425 | - | Mouth to Big Bend | Fair |
| 1980 | 193 | 1,260 | - | Entire | Fair |
| <u>Chukowan River</u> | | | | | |
| 1966 | 986 | 153 | - | Mouth to Gemuk River | Good |
| 1968 | 1,260 | 1,000 | - | Mouth to Gemuk River | Fair |
| 1970 | 1,118 | 1,900 | 75 | Mouth to Gemuk River | Good |
| 1973 | 229 | 15 | - | Mouth to Gemuk River | Fair |
| 1975 | 667 | 550 | 184 | Mouth to Gemuk River | Fair |
| 1976 | 727 | 696 | 76 | Entire | Fair |
| 1978 | 1,064 | 172 | - | Mouth to Enatalik | Good |
| 1982 | 236 | 180 | 1,372 | Entire | Fair |

Appendix Table 20. (Continued)

| Year | Index Count 2/ | | | Area Surveyed | Rating |
|-----------------------------|----------------|-------|-----|---------------|--------|
| | King | Chum | Red | | |
| <u>Salmon River (Pitka)</u> | | | | | |
| 1976 | 1,149 | - | - | Middle Fork | Good |
| 1977 | 1,930 | - | - | Entire 3/ | Good |
| 1978 | 1,083 | - | - | Entire | Good |
| 1977 | 667 | - | - | Entire | Fair |
| 1980 | 1,450 | - | - | Entire | Fair |
| 1981 | 1,474 | - | - | Entire | Fair |
| 1982 | 419 | - | - | Entire | Fair |
| <u>Kogruklu River</u> | | | | | |
| 1961 | 214 | - | 70 | Entire | Fair |
| 1966 | 1,645 | 538 | 85 | Entire | Good |
| 1968 | 2,180 | 3,540 | - | Entire | Fair |
| 1970 | 1,598 | 4,150 | 315 | Entire | Fair |
| 1972 | 476 | 850 | - | Entire | Fair |
| 1975 | 1,080 | 3,973 | 646 | Entire | Fair |
| 1976 | 702 | 378 | 97 | Tower to Maka | Fair |
| 1977 | 1,342 | 606 | 614 | Entire | Good |
| 1980 | 540 | 3,500 | 980 | Entire | Fair |

1/ Only years rated fair or good are included.

2/ Not to be considered an estimate of total escapement.

3/ Entire does not include turbid part of a stream near its mouth.

HERRING

Introduction

Pacific herring (*Clupea harengus pallasii*) are known to spawn in various coastline locations of the Kuskokwim area from Cape Newenham north to the Naskonat Peninsula. These areas include the bays and coves found along the coastline from Cape Newenham north to Carter Spit, including Security Cove, West Cove, and Goodnews Bay. Spawning occurs additionally along portions of Nunivak Island, and throughout Cape Vancouver and the northern shoreline of Nelson Island. The arrival of spawning herring in the Security Cove and Goodnews Bay districts usually occurs from the first to the middle part of May. Spawning herring are expected to be present until the first week in June.

In the Nunivak and Nelson Islands the arrival and spawning of herring occurs from mid-May through mid-June.

During the late 1970's aerial surveys of these areas indicated a trend of increasing herring abundance. This increase in abundance may be attributed to the following reasons: 1) improved survival due to less severe environmental conditions in recent years; 2) reduction of offshore foreign trawling, and 3) elimination of the nearshore Japanese gillnet fishery. At that time an interest began to develop in the commercial harvest of these herring stocks.

The subsistence use of fish and game resources has been designated by the Legislature (State Law 151) as the highest priority among beneficial users. In recognition of the subsistence harvest in the Nelson Island area and the lack of long term biological data the Board of Fisheries has not permitted the development of a commercial fishery in that area. It was determined that a harvestable surplus of herring was present in the Security Cove and Goodnews Bay districts at sufficient levels to support both a subsistence and conservative commercial fishery. In December of 1977 the Board of Fisheries established the present commercial fishing districts. The Security Cove district includes all waters between the northern most point of Carter Spit and Cape Newenham, excluding Goodnews Bay. The portion of Goodnews Bay located inside markers placed near the mouth of the Bay entrance and a line drawn between markers near the mouth of the Goodnews River describe the Goodnews Bay district (Figure 2). A regulatory structure was adopted and commercial herring fishing was opened for the first time in the spring of 1978. Appendix Table 21 summarizes regulation changes affecting the herring fisheries during 1977-1982.

Appendix Table 22 shows the estimated herring biomass in metric tons from 1978 through 1982 in the Security Cove and Goodnews Bay districts. Peak abundances of 19,000 m.t. and 6,700 m.t. were recorded during 1979 in the Security Cove and Goodnews Bay districts, respectively. The commercial harvest has steadily increased since the inception of these fisheries in 1978, peaking in 1981 when fishermen harvested 1,064 metric tons of herring in the Security Cove district and 596 metric tons in the Goodnews Bay district. These commercial districts have been primarily sac roe and to a lesser extent bait herring fisheries harvested by set gillnets. The exception was in 1978 when seven purse seiners landed 259 metric tons of herring from the Security Cove district.

The price structure in these commercial sac roe herring fisheries is based on the roe percentage or recovery of the catch by metric ton. Roe recovery is determined primarily by Japanese technicians who process one or more samples from each delivery. "Immature" or "unmarketable" roe is not included in the roe weights although the weight of "immature" fish is included. A delivery of herring that is determined to have 5% roe recovery or less is usually sold for bait. Average roe recovery for the season has remained fairly stable at 8.2% in the Security Cove district from 1979 through 1981. This figure was inflated by market guidelines placed on fishermen by the industry in the 1982 season. The Goodnews Bay district has experienced a great deal of fluctuation with an average annual roe recovery as low as 4.7% in 1979 and as high as 9.5% in 1980 and 1982 (Appendix Table 22).

The greatest increase in commercial fishing effort for the Security Cove and Goodnews Bay districts occurred in 1980 when 175 and 165 fishermen made landings in these two districts respectively (Appendix Table 23).

Subsistence Fishery

Coastal residents in this area have utilized herring for subsistence purposes as far back as records have been kept. Subsistence utilization of herring depends a great deal on the availability of alternative nutritional resources.

The villages of Nelson Island, which include Newtok, Tununak, Toksook Bay and Nightmute, have traditionally harvested herring with short gillnets. The nets are often no longer than 10 fathoms, and are operated near their villages as herring move inshore during the spring to spawn. The Alaska Department of Fish and Game, Commercial Fisheries Division, has conducted household surveys in these villages since 1975 in an effort to define the harvest and dependence on herring (Appendix Table 24). Subsistence users in these villages have shown a steady dependence on the spring herring, with an average of 77 families harvesting 75.2 metric tons per year for the period from 1975-1981. The herring are primarily dried in strings and stored to be used throughout the remainder of the year. Fishermen tend to prefer the "second run" or the younger age class fish for this purpose because they are smaller, contain less body fat and are easier to dry.

Other villages that are dependent on a herring fishery to a lesser degree include Cheforak, Kipnuk, Kongiganak, Kwigillingok, Mekoryuk, Quinhagak, Goodnews Bay and Platinum. Surveys conducted by the Department during 1976-78 indicate that villages south of the Yukon River are more dependent on subsistence herring fishing than villages north of the river. This is thought to be attributed to the greater availability of big game animals and marine mammals as a food source in the more northern communities.

Security Cove Commercial Fishery

Harvest and Fishing Effort

A harvest of 737 metric tons of herring (87% sac roe, 13% bait) was taken by 107 permit holders in the 1982 season (Table 15). Roe recovery for the season averaged 9.3% with the catch worth an estimated 0.27 million dollars. Fishermen were paid an average of \$400 per metric ton of 10% roe recovery

herring, with +\$40 for each percentage point above or below 10%. The price for bait and food herring ranged from \$50 to \$100 per short ton. It should be noted that the higher average roe percentage for the 1982 season was attributed to processors raising the roe recovery necessary to be classified as sac roe. One processor classified the fish as follows: 5% - bait, 5% - 6% food fish and 6% or above sac roe. Another classified 7% or above as sac roe while the other only took 8.1% or above.

Three floating processors, less than half the number in 1981, operated with a majority of herring processed by freezing and the product offloaded directly onto Japanese trampers present on the fishing grounds. Lack of any processors on the grounds early in the season almost delayed fishing during the first opening (Table 14).

The season was opened by emergency order on May 25. There was a total of 302 hours open to commercial fishing between May 25 and June 7. Unlike the 1981 season, commercial fishing was opened for 11 days of continuous fishing during the season. Seventy-four percent of the total harvest was taken during May 29-31 when a maximum of 68 fishermen in 49 boats participated. Prior to and after this time period, the number of fishermen making deliveries ranged from 0-18 each day (Table 15).

The fishing fleet was composed of 93% non-local and 7% local fishermen who accounted for 94% and 6% of the harvest respectively. Persons residing within the Calista native region (Coastal area from Goodnews Bay to the Yukon River) were considered "local". Alaskan residents comprised 44% of the fishermen in the district (Table 16). The reduced effort as compared to previous years could be attributed to three factors: 1) the lateness of the run, 2) the concerns of the Togiak gillnet fleet to remain in the more lucrative Bristol Bay fishery, and 3) extremely inclement weather.

Enforcement

Enforcement problems in the Security Cove district were decreased from the 1980 and 1981 seasons due to the presence of the Division of Fish and Wildlife Protection vessel M/V Public Safety I, which travelled up from the Togiak district. Three citations were issued, the major one dealt with fishing excessive gear. These fish were confiscated. Some problems were encountered with unmarked or improperly marked gear.

Stock Status

Herring abundance was estimated primarily by aerial survey methods. Surface area estimates were made of each school and depending on water depth, a tonnage figure assigned. A total of 19 aerial surveys was flown on 19 separate days during the 1982 season from April 30 until June 6. Inclement weather prevailed throughout the 1982 inshore herring migration preventing fish school observations representative of the herring biomass (Appendix Table 22). Over 80% of the surveys were conducted under at least partially unsatisfactory conditions.

Fish were first observed in the Security Cove District on May 15 with the first test fish catches of herring not occurring until May 19. The fish observed prior to this date are suspect of being capelin as test net catches

of capelin occurred as early as May 17. The observed peak biomass of 1,358 m.t. observed in the nearshore area of Security Cove occurred on May 25, however, it is felt that the peak herring biomass occurred around May 30 as depicted by commercial catch rates and spawn (milt) observations. Five miles of spawn was observed during 1982 which was slightly reduced from 1981 (6.3 miles). This decline can be partially attributed to fewer surveys and inadequate survey conditions.

It is estimated that the 1982 herring biomass within Security Cove District was approximately 4,600 m.t. This biomass estimate is felt to be representative of the stock size for 3 reasons: 1) the peak observed biomass occurred in only a small portion of the district with adjacent waters being turbid, 2) spawn (milt) observations were in the same magnitude as during 1981, 3) no unanticipated change occurred within the age class composition. This estimate also reflects the decrease in biomass observed in the adjacent district of Togiak where reasonably reliable biomass estimates were made.

Test fishing was conducted from May 13 through June 9. A total 643 herring was sampled from these catches. Herring accounted for 70% of the total catch of schooling fishes.

Commercial and test fishing samples indicated that age 4 and 5 year old herring comprised approximately 22% and 55%, respectively. Also present but to a lesser extent were age 6, 8 and 9 herring.

Outlook and Management Strategy for 1983

There are no regulation changes for this district and the overall management strategy is not anticipated to change a great deal from that of 1982. Based on the 1982 herring spawning return and harvest, the Department anticipates a harvestable surplus of herring will be available in 1983. Since actual returns for 1983 cannot be estimated, harvest levels will be adjusted during the season according to results of aerial and ground surveys in accordance with emergency order authority. A minimum total daily biomass estimate of 800-1,000 metric tons of herring will be required before fishing can begin. If it is not possible to determine herring abundance by using aerial surveys, stock conditions will be assessed by using commercial catch rates, the percentage of roe recovery, ratios of pre- to post- spawners from test nets and commercial catches, spawn deposition observations and previous year aerial survey data as a base estimate of abundance.

In-season temporary closures may be necessary if there is a lack of timeliness or accuracy in catch reporting by buyers to the extent that it inhibits the Department's ability to properly manage the fishery. These closures may also be imposed in the sac roe fishery if the harvest accelerates at a pace which makes it difficult or impossible to construct meaningful cumulative harvest estimates, or if the total harvest is nearing the guideline harvest level and stock strength has yet to be satisfactorily defined. It is possible that temporary closure of the fishery may be required if large numbers of spotter aircraft are creating a safety hazard for ADF&G personnel conducting aerial surveys.

The number and duration of fishing periods will be dependent on daily herring abundance and fishing effort. Fishing periods will likely be of short

duration, 6 to 24 hours, followed by temporary closures. Attempts will be made to maintain an overall harvest of 10-20% of the available biomass.

Enforcement activities will be present, with special attention to violations previously discussed as problems during the 1982 season. Fish and Wildlife officers will be present aboard an enforcement vessel.

A two man crew will be located on the beach at Security Cove in 1983 monitoring and sampling the commercial catch and test fishing to document herring run timing and age class composition and to conduct spawn and spawn substrate surveys.

Goodnews Bay Commercial Fishery

Harvest and Fishing Effort

As in Security Cove, commercial herring fishing was regulated by emergency order in 1982 for a more orderly fishery and to better assess herring abundance and conditions. A total catch of 441 metric tons (90% sac roe, 10% bait) was landed by 84 permit holders (Table 17). This fishery had one 12 hour opening on May 24 to start the season. It reopened on May 25 and remained open until June 7 with a total of 314 hours of available fishing time. Inclement weather combined with lack of processors deterred fishing from May 25 until May 28. Peak catches were made May 31. Average roe recovery was 9.5% with the same price per ton and sliding price structure as that used in Security Cove. The value of harvested herring to the fishermen was estimated at 0.19 million dollars.

Three processors purchased herring, a decrease of two compared to the 1981 season. The majority of fishermen in this area were from the local area comprising 89% of the fleet and taking 96% of the catch. Alaska residents made up 98% of the total fishermen and they harvested 99% of the total catch. Approximately 51 boats fished the Goodnews Bay district. Fishing effort was the second lowest since the 1979 effort of 41 fishermen (Table 18).

Enforcement

Similar to Security Cove, enforcement problems in the Goodnews Bay district were decreased from previous seasons due to the presence of the Division of Fish and Wildlife Protection. In this district violations are easier to observe and document due to the small size of the Bay. The major violation in the Goodnews Bay district involved a processor who purchased fish prior to registration for the area. Other complaints filed include fishing excessive gear, and lack of proper licenses (i.e. vessel, crew members).

Stock Status

Herring abundance was assessed throughout the season, similar to the discussion for the Security Cove district. A total of 19 aerial surveys was flown on 19 days from April 30 through June 7. Over 90% of the surveys were conducted under partially unsatisfactory conditions. No fish were observed by aerial survey within Goodnews Bay district due to turbid water throughout the season.

Test fishing was conducted from May 18 through June 9. A total of 536 herring was sampled from these catches. A post-season herring biomass estimate of 2,400 m.t. was adopted, assuming the same decrease in population occurred as was documented for the adjacent district. No milt patches were observed during aerial surveys in 1982.

Commercial and test fishing samples indicated that age 4 and 5 year old herring comprised approximately 19% and 43%, respectively.

Outlook and Management Strategy for 1983

There is relatively little data from which to project the 1983 herring return. The Department anticipates a herring spawning return corresponding to that in the Security Cove district, with a harvestable surplus of herring available in 1983. A similar research program as in 1982 will be conducted during the 1983 season, consisting of aerial surveys, test fishing and commercial catch sampling.

The management strategy for this district will be similar to that used for Security Cove: 1) Emergency order regulation of seasons and fishing periods, 2) minimum total daily biomass of 800-1,000 metric tons prior to the season opening, and 3) 10-20% harvest of available biomass. There are no new regulations for this district in 1983.

Fish and Wildlife officers will be present periodically during the season in the Goodnews Bay district. As in Security Cove, enforcement activities will target previous problem areas. Fishery technicians will continue to conduct test gillnetting studies and commercial catch spawn deposition surveys, and to handle buyer registration and daily catch reporting.

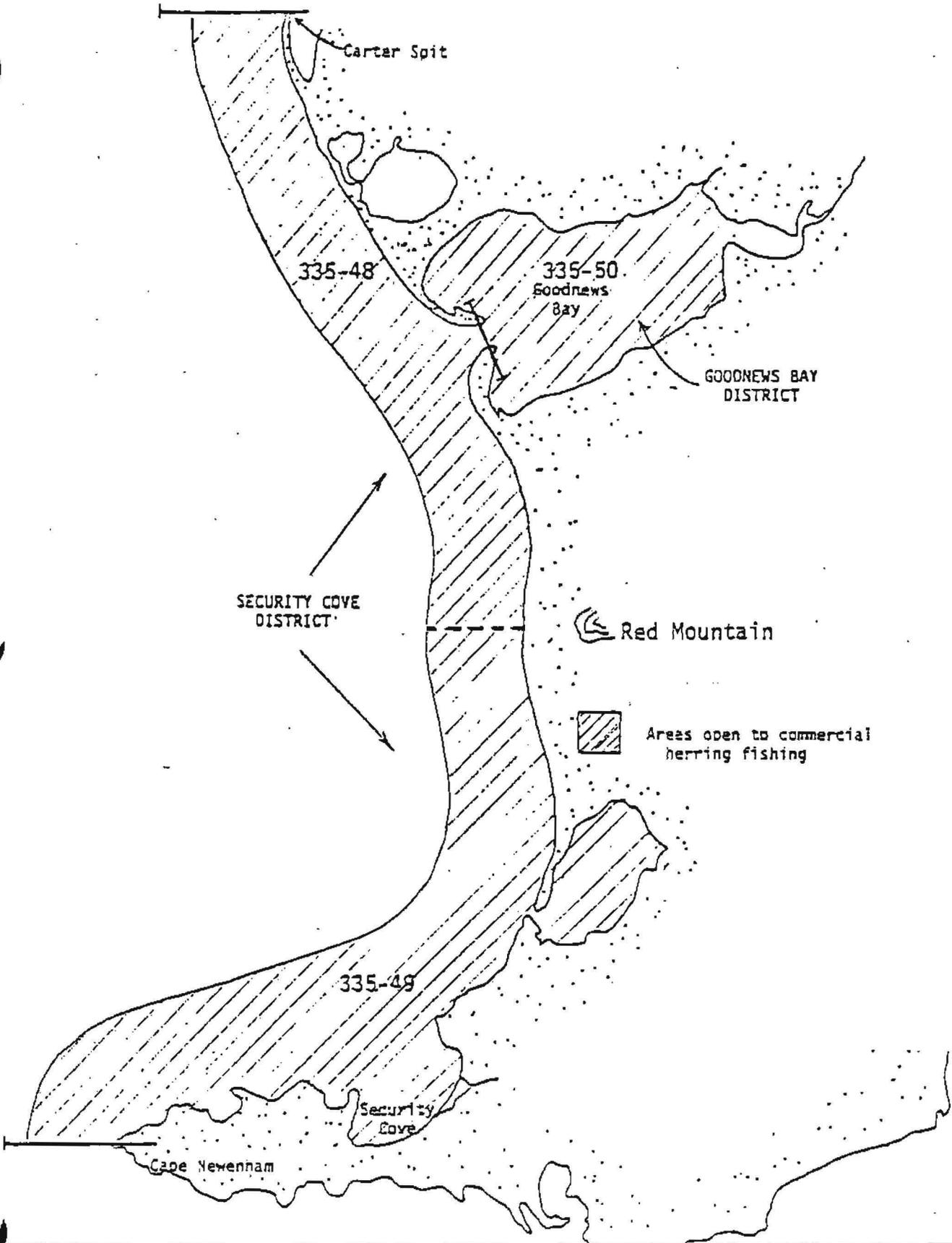


Figure 2. Goodnews Bay and Security Cove herring districts and statistical reporting areas.

Table 13. Kuskokwim Area Herring Fishery Emergency Orders, 1982.

| E.O. No. | Date | Action Taken | Justification |
|----------|--------|--|---|
| 1 | 22 May | Opened Goodnews Bay district to commercial herring fishing from 9 am until 7 pm May 5, 1982. | Department test fishing catches indicated presence of sexually mature herring in the district. |
| 2 | 25 May | Opened Goodnews Bay and Security Cove districts to commercial herring fishing from 10:00 pm on May 25, 1982 until 12:00 pm May 26, 1982. | Aerial surveys and Department test fishing indicated that sexually mature herring were present in sufficient numbers. |
| 3 | 26 May | Extended the commercial fishing period in Goodnews Bay and Security Cove districts for 24 hours, from 12:00 pm May 26, 1982 until 12:00 pm May 28, 1982. | Gale winds and high seas precluded fishing in both districts. Department test fishing indicated that fish continued to be present in both districts. |
| 4 | 27 May | Extended the commercial fishing period in Goodnews Bay and Security Cove Districts for 24 hours from 12:00 pm May 27, 1982 until 12:00 pm May 28, 1982. | Poor weather continued to preclude commercial fishing activity and aerial assessment of biomass. Department test fishing indicated that sexually mature fish continued to be present in both districts. |
| 5 | 28 May | Extended commercial fishing in Goodnews Bay and Security Cove Districts from 12:00 pm May 28, 1982 until further notice. | Department test fishing indicated that an increasing number of sexually mature fish and younger class fish were present in both districts. |
| 6 | 7 June | Closed Goodnews Bay and Security Cove districts to commercial herring fishing effective 12:00 pm June 7, 1982. | Declining fishing effort and the need to preserve the recruitment age classes warranted a closure for both districts. |

Table 14. Kuskokwim Area Herring Processors and Associated Data, 1982.

| <u>Commercial Operator</u> | <u>Product</u> | <u>District</u> |
|---|-------------------|-------------------------------|
| Bristol Monarch | Herring | Goodnews Bay |
| Comeau International Suite 1626 2020 University St. Montreal, Quebec CANADA H 3A2A5 | Herring Frozen | Security Cove |
| Denali Seafoods Box 17703 Seattle, WA. 98107 | Herring Frozen | Security Cove |
| E & J Fisheries c/o John Seager Platinum, AK. 99651 | Herring Salted | Goodnews Bay |
| Trident Seafoods 653 N.W. 41st St. Seattle, WA 98107 | Herring Frozen | Security Cove Goodnews Bay |

Table 15. Commercial herring catch data, Security Cove District, 1982.

| Fishing Period | Hours | # Deliveries | # Permit Holders | # Boats | Catch (m.t.) | | | Ave. Roe % |
|----------------------------|------------|--------------|------------------|-----------|---------------|--------------|---------------|-------------|
| | | | | | Sac Roe | Bait/ Food | Total | |
| May 25-26 (10 pm-12 pm) | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| May 27 1/ (12 pm-12 pm) | 24 | 4 | 4 | 3 | 0 | 27.27 | 27.27 | - |
| May 28 | 24 | 7 | 6 | 5 | 12.27 | 4.55 | 16.82 | 9.73 |
| May 29 | 24 | 41 | 31 | 27 | 133.10 | 13.21 | 146.31 | 9.24 |
| May 30 | 24 | 82 | 68 | 49 | 244.70 | 34.67 | 279.37 | 9.03 |
| May 31 | 24 | 45 | 42 | 41 | 111.38 | 8.82 | 120.20 | 9.23 |
| June 1 | 24 | 6 | 6 | 5 | 6.43 | 0 | 6.43 | 9.62 |
| June 2 | 24 | 6 | 6 | 5 | 9.36 | 0 | 9.36 | 10.53 |
| June 3 | 24 | 9 | 7 | 6 | 21.62 | 0 | 21.62 | 9.19 |
| June 4 | 24 | 21 | 18 | 17 | 41.75 | 5.16 | 46.91 | 9.50 |
| June 5 | 24 | 7 | 6 | 6 | 12.50 | 0 | 12.50 | 10.54 |
| June 6 | 24 | 15 | 11 | 11 | 29.66 | 4.18 | 33.84 | 10.60 |
| June 7 2/ | 24 | 6 | 6 | 6 | 16.45 | 0 | 16.45 | 10.91 |
| TOTALS | 302 | 250 | 107 | 59 | 639.22 | 97.86 | 737.08 | 9.33 |

1/ Fishing periods extended until further notice.

2/ Season closed at 12 noon, June 7.

Table 16. Security Cove District comparative herring catch (lbs.) by user group (permit holder) by period, 1982.

| Date | 1/ | Local | Non-Locals | Residents | Non-Residents |
|----------------|--------|---------|------------|-----------|---------------|
| 5/27 | Effort | 0 | 4 | 2 | 2 |
| | Catch | 0 | 60,000 | 43,000 | 17,000 |
| 5/28 | Effort | 1 | 5 | 3 | 3 |
| | Catch | 3,500 | 41,500 | 29,000 | 16,000 |
| 5/29 | Effort | 1 | 30 | 9 | 22 |
| | Catch | 8,000 | 305,890 | 95,249 | 218,641 |
| 5/30 | Effort | 5 | 63 | 30 | 38 |
| | Catch | 36,300 | 578,305 | 281,685 | 332,920 |
| 5/31 | Effort | 2 | 40 | 17 | 25 |
| | Catch | 5,200 | 259,233 | 118,594 | 145,839 |
| 6/1 | Effort | 0 | 0 | 0 | 0 |
| | Catch | 0 | 14,144 | 10,263 | 3,881 |
| 6/2 | Effort | 3 | 3 | 4 | 2 |
| | Catch | 12,500 | 8,100 | 14,400 | 6,200 |
| 6/3 | Effort | 1 | 6 | 5 | 2 |
| | Catch | 12,900 | 34,666 | 38,066 | 9,500 |
| 6/4 | Effort | 4 | 14 | 7 | 11 |
| | Catch | 12,600 | 90,600 | 21,150 | 82,050 |
| 6/5 | Effort | 0 | 6 | 1 | 5 |
| | Catch | 0 | 27,500 | 5,800 | 21,700 |
| 6/6 | Effort | 2 | 9 | 5 | 6 |
| | Catch | 9,200 | 65,250 | 29,000 | 45,450 |
| 6/7 | Effort | 0 | 6 | 3 | 3 |
| | Catch | 0 | 32,200 | 25,200 | 7,000 |
| SEASON | Effort | 8 | 99 | 47 | 60 |
| TOTAL | Catch | 100,200 | 1,517,388 | 711,407 | 906,181 |
| TOTAL % EFFORT | | 7% | 93% | 44% | 56% |
| TOTAL % CATCH | | 6% | 94% | 44% | 56% |

1/ Residents of AVCP Region.

Table 17. Commercial herring catch data (m.t.), Goodnews Bay District, 1982.

| Fishing Period | Hours | # Deliveries | #Permit Holders | #Boats | Catch (m.t.) | | | Ave. Roe % |
|-------------------------------------|------------|--------------|--------------------|-----------|---------------|--------------|---------------|---------------|
| | | | | | Sac Roe | Bait | Total | |
| 5 am-5 pm May 24 | 12 | 11 | 10 | 8 | 4.52 | 9.58 | 14.10 | 9.16 |
| 10 pm May 25 - 12 noon May 26 1/ | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12 pm May 26 - 12 noon May 27 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| May 28 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| May 29 | 24 | 20 | 20 | 17 | 23.60 | 10.51 | 34.11 | 10.00 |
| May 30 | 24 | 38 | 25 | 20 | 54.08 | 6.84 | 60.92 | 10.16 |
| May 31 | 24 | 46 | 33 | 26 | 58.68 | 15.36 | 74.04 | 8.39 |
| June 1 | 24 | 25 | 20 | 17 | 41.16 | 0 | 41.16 | 8.58 |
| June 2 | 24 | 37 | 27 | 24 | 51.43 | 0 | 51.43 | 8.35 |
| June 3 | 24 | 18 | 16 | 15 | 26.95 | 0 | 26.95 | 8.31 |
| June 4 | 24 | 20 | 19 | 17 | 26.14 | 0 | 26.14 | 7.94 |
| June 5 | 24 | 68 | 37 | 31 | 72.22 | 0 | 72.22 | 8.81 |
| June 6 | 24 | 19 | 16 | 14 | 26.32 | 0.50 | 26.82 | 9.90 |
| June 7 2/ | 24 | 8 | 7 | 7 | 13.43 | 0 | 13.43 | 9.32 |
| TOTAL | 314 | 310 | 84 | 51 | 398.53 | 42.79 | 441.32 | 9.48 |

1/ Fishing periods extended until further notice.

2/ Season closed at 12 noon, June 7.

Appendix Table 18. Subsistence Fishery Historical Summary, Kuskokwim River, 1960-1982. 1/

| Year | Fishing Families Surveyed | AVERAGE NUMBERS PER FISHING FAMILY | | | | |
|------|---------------------------|------------------------------------|------|-------------|-----------------|------------|
| | | People | Dogs | King Salmon | Other Salmon 2/ | Fishwheels |
| 1960 | 247 | 5.89 | 6.66 | 60 | 1,074 | ? |
| 1961 | 342 | 6.02 | 6.33 | 39 | 453 | .19 |
| 1962 | 349 | 6.50 | 6.30 | 79 | 470 | .18 |
| 1963 | 405 | 6.14 | 5.29 | 87 | 351 | .11 |
| 1964 | 394 | 6.33 | 5.44 | 70 | 454 | .10 |
| 1965 | 332 | 5.95 | 5.45 | 64 | 669 | .08 |
| 1966 | 492 | 5.91 | 4.49 | 91 | 320 | .06 |
| 1967 | 472 | 6.36 | 5.22 | 106 | 375 | .06 |
| 1968 | 567 | 6.23 | 5.31 | 53 | 447 | .06 |
| 1969 | 376 | 6.49 | 5.51 | 78 | 385 | .05 |
| 1970 | 514 | 6.33 | 4.65 | 108 | 384 | .02 |
| 1971 | 488 | 6.53 | 4.30 | 88 | 238 | .01 |
| 1972 | 576 | 6.78 | 3.08 | 51 | 166 | .02 |
| 1973 | 408 | 6.55 | 3.84 | 81 | 356 | .02 |
| 1974 | 596 | 6.24 | 3.61 | 45 | 466 | .02 |
| 1975 | 437 | 6.41 | 3.99 | 79 | 310 | .02 |
| 1976 | 494 | 6.53 | 3.81 | 86 | 335 | .02 |
| 1977 | 502 | 6.33 | 3.83 | 89 | 309 | .02 |
| 1978 | 613 | 6.02 | 4.29 | 53 | 190 | .01 |
| 1979 | 698 | 5.98 | 4.25 | 68 | 184 | .01 |
| 1980 | 722 | 5.84 | 4.55 | 76 | 214 | .01 |
| 1981 | 595 | 5.95 | 4.69 | 71 | 208 | .01 |
| 1982 | 659 | 6.21 | 5.23 | 59 | 205 | .02 |

1/ Unexpanded data only.

2/ Does not include coho salmon.

Table 18. Goodnews Bay District comparative herring catch (lbs.) by user group (permit holders) by period, 1982

| Date | 1/ | Locals | Non-Locals | Residents | Non-Residents |
|--------|--------|---------|------------|-----------|---------------|
| 5/24 | Effort | 6 | 4 | 9 | 1 |
| | Catch | 24,048 | 6,975 | 30,628 | 395 |
| 5/25 | Effort | 0 | 0 | 0 | 0 |
| | Catch | 0 | 0 | 0 | 0 |
| 5/26 | Effort | 0 | 0 | 0 | 0 |
| | Catch | 0 | 0 | 0 | 0 |
| 5/27 | Effort | 0 | 0 | 0 | 0 |
| | Catch | 0 | 0 | 0 | 0 |
| 5/28 | Effort | 0 | 0 | 0 | 0 |
| | Catch | 0 | 0 | 0 | 0 |
| 5/29 | Effort | 20 | 0 | 20 | 0 |
| | Catch | 75,051 | 0 | 75,051 | 0 |
| 5/30 | Effort | 24 | 2 | 26 | 0 |
| | Catch | 122,025 | 8,700 | 130,725 | 0 |
| 5/31 | Effort | 31 | 2 | 32 | 1 |
| | Catch | 154,100 | 6,800 | 156,400 | 4,500 |
| 6/1 | Effort | 19 | 1 | 20 | 0 |
| | Catch | 76,406 | 16,130 | 92,536 | 0 |
| 6/2 | Effort | 28 | 0 | 28 | 0 |
| | Catch | 113,150 | 0 | 113,150 | 0 |
| 6/3 | Effort | 16 | 0 | 16 | 0 |
| | Catch | 59,300 | 0 | 59,300 | 0 |
| 6/4 | Effort | 18 | 1 | 19 | 0 |
| | Catch | 56,500 | 1,000 | 57,500 | 0 |
| 6/5 | Effort | 37 | 0 | 37 | 0 |
| | Catch | 158,900 | 0 | 158,900 | 0 |
| 6/6 | Effort | 16 | 0 | 16 | 0 |
| | Catch | 58,998 | 0 | 58,998 | 0 |
| 6/7 | Effort | 7 | 0 | 7 | 0 |
| | Catch | 29,547 | 0 | 29,547 | 0 |
| SEASON | Effort | 75 | 9 | 82 | 2 |
| TOTAL | Catch | 928,025 | 39,605 | 962,735 | 4,895 |
| TOTAL% | Effort | 89% | 11% | 98% | 2% |
| TOTAL% | Catch | 96% | 4% | 99% | 1% |

1/ Residents of AVCP Region

Appendix Table 21. Summary of important regulation changes affecting the commercial herring fishery in Security Cove and Goodnews News Bay districts, 1977-1982.

| <u>Year</u> | <u>Action Taken</u> | <u>Explanation</u> |
|-------------|---|---|
| 1977 | Established commercial fishing districts of Security Cove and Goodnews Bay. | Security Cove district defined as all waters between the latitude of the northernmost point of Carter Spit and the latitude of Cape Newenham, excluding Goodnews Bay. The Goodnews Bay consists of the portion of Goodnews Bay inside a line between markers placed near the bay entrance and a line between markers placed near the mouth of the Ufigag River and on the opposite shore near the mouth of the Tunulik River. |
| 1977 | Specified that herring may be taken by the use of purse seines, beach seines, and gillnets in the Security Cove district. Gillnets only could be used in the Goodnews Bay district. | To identify appropriate gear types to be operated in these districts. |
| 1977 | Established purse seine and gillnet specifications. | In both districts the gillnet mesh size was restricted to not less than 2 1/8 inches and not more than 3 inches. Total of 150 fathoms of herring gillnet permitted to be operated from single licensed fishing vessel; no single herring gillnet allowed to exceed 50 fathoms. In Security Cove seines were restricted to maximum of 850 meshes in depth, no seine was permitted to be more than 150 fathoms in length. |
| 1977 | Established harvest guideline of 100 metric tons for Goodnews Bay district, and 350 metric tons for Security Cove district. | To provide for conservative development of the Security Cove and Goodnews Bay commercial herring fishery. |

Appendix Table 21 (continued).

| <u>Year</u> | <u>Action Taken</u> | <u>Explanation</u> |
|-------------|---|--|
| 1978 | Established the commercial season from May 1 through June 30 in the Security Cove district and provided for the fishing season to be opened and closed by emergency order in the Goodnews Bay district. | To provide for more discretely defined fishing seasons by regulation. Resulted in establishing primarily a sac roe fishery. |
| 1978 | Eliminate the use of purse seines in the Security Cove district. | To provide for a limited harvest by gear type and consequently allow a more even harvest from a wider segment of the herring population. |
| 1978 | Reduced the aggregate length for herring gill-nets to 100 fathoms in the Security Cove and Goodnews Bay districts. | To minimize potential gear conflicts. |
| 1978 | Closed Waters section adopted. | To restrict the fishing activities to the areas where herring has been identified. |
| 1978 | Prohibited any commercial harvest of herring spawn and herring spawn on kelp. | To protect the herring spawning grounds in areas where relatively small herring populations are present. |
| 1979 | Increase the harvest guidelines to 750 and 300 metric tons in the Security Cove and Goodnews Bay districts respectively. | To allow an increased commercial harvest in these districts. |

Appendix Table 21 (continued)

| <u>Year</u> | <u>Action Taken</u> | <u>Explanation</u> |
|-------------|---|---|
| 1979 | Establish a new section to deal with buyer reporting requirements. | Require that processors register with the Department upon arrival on the fishing grounds. Processors shall identify all tenders and establish a daily schedule to report herring purchased. Fish tickets are to be submitted prior to a buyer leaving the district or within 10 days after the closure of the commercial fishery. |
| 1980 | Establish the opening of the Security Cove herring fishery by emergency field order. | To allow for a flexible in-season management strategy. |
| 1980 | Reduced the total gear limit in the Security Cove and Goodnews Bay districts to be not more than 100 fathoms. Provide for a single gillnet to be less than 50 fathoms, providing the gill net is attached to a commercial herring fishing vessel and net is personally attended by an interim use or permit holder. | To minimize the gear congestion present in this district and to allow for test or sample fishing. This test fish would allow fishermen to evaluate the quality of a school of herring, leading to overall decrease in wastage of unmarketable herring. |

Appendix Table 22. Estimated herring biomass and commercial harvest data for Security Cove and Goodnews Bay districts, 1978-1982.

| District | Estimated Biomass (m.t.) | Harvest (m.t.) | Biomass % Harvest | Roe % | Estimated Value (dollars) |
|---------------|-----------------------------|----------------|----------------------|-----------|------------------------------|
| | | | 1978 | | |
| Security Cove | 1,200 | 259 | 21.6 | 2/ | - |
| Goodnews Bay | 400 | 0 | - | (40 lbs.) | - |
| | | | 1979 | | |
| Security Cove | 19,500 | 385 | 2.0 | 8.5 | 327,000 |
| Goodnews Bay | 6,700 | 82 | 1.2 | 4.7 | 38,500 |
| | | | 1980 | | |
| Security Cove | 1,100 1/ | 632 | 57.4 | 8.2 | 151,000 |
| Goodnews Bay | 1,100 1/ | 406 | 36.9 | 9.5 | 97,000 |
| | | | 1981 | | |
| Security Cove | 7,500 | 1,064 | 14.2 | 8.1 | 347,070 |
| Goodnews Bay | 3,900 | 596 | 15.3 | 7.7 | 196,170 |
| | | | 1982 | | |
| Security Cove | 4,600 | 737 | 15.9 | 9.3 | 283,800 |
| Goodnews Bay | 2,400 | 441 | 18.3 | 9.5 | 166,600 |

1/ Minimum estimates.

2/ Not available.

Appendix Table 23. Numbers of buyers and fishermen participating in commercial herring fisheries in Security Cove and Goodnews Bay districts, 1978-1982.

| District | Number of Buyers | Number of Fishermen | |
|---------------|------------------|---------------------|----------------|
| | | Gillnet | Purse Seine 1/ |
| | | 1978 | |
| Security Cove | 3 | - | 7 |
| Goodnews Bay | 0 | 1 | 0 |
| | | 1979 | |
| Security Cove | 2 | 61 | 1/ |
| Goodnews Bay | 1 | 41 | 1/ |
| | | 1980 | |
| Security Cove | 8 | 175 | 1/ |
| Goodnews Bay | 4 | 165 | 1/ |
| | | 1981 | |
| Security Cove | 7 | 113 | 1/ |
| Goodnews Bay | 5 | 175 | 1/ |
| | | 1982 | |
| Security Cove | 3 | 107 | 1/ |
| Goodnews Bay | 3 | 84 | 1/ |

1/ Purse seine gear prohibited after 1978.

Appendix Table 24. Subsistence herring catch (in metric tons) and effort data for selected villages, eastern Bering Sea, Alaska, 1975-1982. 1/

| Village | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 |
|--------------------------------------|------|------|------|------|------|-------|------|---------|
| <u>Nelson Island</u> | | | | | | | | |
| Tununak | 19.8 | 13.9 | 51.9 | 34.6 | 31.0 | 59.2 | 36.0 | 43.8 |
| Unkumiut | 30.0 | 8.5 | 2.8 | 10.4 | 7.5 | 3.1 | 9.0 | 0 |
| Toksook Bay | 31.0 | 31.8 | 19.3 | 33.5 | 46.5 | 26.6 | 13.0 | 31.6 |
| Total | 80.8 | 61.2 | 74.0 | 78.5 | 85.0 | 88.9 | 58.0 | 75.4 |
| Number of Fishing Families | 109 | 42 | 90 | 83 | 54 | 70 | 93 | 65 |
| <u>Other Kuskokwim Area Villages</u> | | | | | | | | |
| Kwigillingok | - | 9.6 | 0.9 | - | 7.2 | 12.0 | - | 12.0 2/ |
| Total Catch | 80.8 | 70.8 | 74.9 | 78.5 | 92.2 | 100.9 | 58.0 | 87.4 |

1/ Other areas with small catches have been surveyed irregularly (1975-1978 estimated total coastal yearly subsistence catch averaged 100 m.t.)

2/ Estimate based on post-season observations rather than survey.

WHITEFISH AND OTHER MISCELLANEOUS FRESHWATER SPECIES

Introduction

Several species other than salmon and herring that are utilized for commercial, subsistence and recreational purposes in the Kuskokwim Area include inconnu or sheefish (Stenodus leucichthys), whitefish (Coregonus sp., Prosopium sp.), Arctic char (Salvelinus alpinus), rainbow trout (Salmo gairdneri), burbot (Lota lota), Arctic grayling (Thymallus arcticus) and pike (Esox lucius) (Appendix Table 2).

These fish are taken by set gillnets, fish traps, "jigging" through the ice and rod-and-reel. Subsistence catches taken during the spring and summer months are generally sun-dried, while catches made during the winter are stored frozen. Many of these fish are used for human consumption, but a significant percentage are fed to dogs. Fish taken for commercial purposes are mainly sold locally, although a small portion are shipped from the area frozen.

Subsistence harvests of these miscellaneous species are not limited by regulation. Commercial harvests may be prohibited in some freshwater areas, but limited commercial endeavors are allowed in many areas under terms of a permit.

Whitefish

Members of the whitefish family Coregonidea are among the most important fish in the area. Five species are found on the tundra of the Kuskokwim Delta. The very numerous remains of the Eskimo sod houses found along many waterways of the tundra bears witness to the great historic importance of the whitefish on the tundra.

Various methods are used for the subsistence harvesting of these fish. These include gillnets, fish traps, and jigging through the ice. Annual village subsistence harvest has not been closely monitored by the Division of Commercial Fisheries in recent years; however, annual harvests of approximately 200 pounds per family in some villages have been documented. With a heavy subsistence dependence on whitefish, the commercial harvest has been kept low. The majority of the commercial catch is taken incidentally in the district 1 (lower Kuskokwim) during the fall coho salmon fishery.

The commercial harvest of whitefish is primarily aimed at the broad whitefish. These are harvested by gillnets, which have been restricted by regulation to a minimum 5 inch mesh size or larger. This mesh size allows escapement of the smaller, fast growing fish and generally allows the whitefish to spawn once before being harvested.

Only a few commercial whitefish buyers' permits have been issued for the Kuskokwim area since 1977. Six permits were issued during 1982 with three permits actively used to purchase fish (Appendix Table 25). Documented catches have remained fairly stable since 1977 with an average 1,497 fish harvested annually. The 1982 whitefish catch was entirely marketed within the Kuskokwim area.

Whitefish escapements have not been monitored in the past, but there have been no indications from limited Department observations or fishermen interviews of declining populations in recent years.

Appendix Table 25 . Commercial whitefish catch data,
Kuskokwim River 1977-1982.

| Year | Number of Fishermen | Catch | Value | Pounds |
|---------|------------------------|-------|-------|--------|
| 1977 | 3 | 718 | \$952 | 2/ |
| 1978 | 2/ | 1,735 | 2/ | 6,017 |
| 1979 | 2/ | 3,219 | 2/ | 11,211 |
| 1980 1/ | 4 | 603 | 830 | 2,173 |
| 1981 1/ | 4 | 1,197 | 2,310 | 4,620 |
| 1982 | 5 | 1,512 | 2,856 | 6,219 |

1/ Does not include catches incidental to coho salmon fishery.

2/ Data not available.

HALIBUT

Pacific Halibut (Hippoglossus stenolepis) are found in the marine waters off the coasts of Nelson and Nunivak Islands. Annual village subsistence harvests have not been monitored by the Division of Commercial Fisheries however periodic contact with these areas have shown that halibut is used for subsistence purposes in Mekoryuk and Tununak. Subsistence harvests of this species is not limited by state regulation. There are two primary methods of harvesting these fish, jigging and longlining. The majority of the commercial catch is taken by longline.

A pilot halibut commercial fishery at Mekoryuk was conducted in 1966 by the Bureau of Indian Affairs. All the fishing took place in an area west of Cape Etolin. Ten fishermen took part in this study landing 533 halibut for a total of 8,799 pounds. This fishery was worth approximately \$1,760 to the fishermen. Leonard Revet and Jeffrey Keahon authored a report on this pilot fishery and concluded that the people of Mekoryuk did not seem interested in commercial halibut fishing at this time.

No further commercial activity took place by local residents until June 1982. Bering Sea Fishermen's Association worked as advisors in initiating a commercial halibut project, together with Nunam Kitlutsisti and the Nelson Island villages. Thirty-two fishermen landed 409 halibut for a total of 8,148 pounds. This fishery was worth approximately \$6,730 to the fishermen. The majority of the fish were marketed in Bethel (approximately 6,000 lbs.) with the remainder sent to Fairbanks. All fish were headed and marketed as a fresh product.

This fishery proceeded fairly smoothly, however, one area of concern was the use of locally caught herring as bait in the commercial halibut fishery. Technically this was illegal as the area is closed to commercial herring fishing. Fishermen have expressed an interest in purchasing bait herring from the spring commercial herring fishery that takes place in Cape Romanzof for future years.