3A88-30

ALASKA DEPARTMENT OF FISH AND GAME

DIVISION OF COMMERCIAL FISHERIES

ANNUAL MANAGEMENT REPORT

1987

YUKON AREA

Regional Information Report[1] No. 3A88-30

ANCHORAGE AREA OFFICE — 333 Raspberry Road, 99518
Craig Whitmore (Lower Yukon Area Management Biologist)
Daniel J. Bergstrom (Assistant Area Management Biologist)
Lawrence S. Buklis (Lower Yukon Research Project Leader)
Margaret Merritt (Chinook Salmon Stock Biology Project Leader)

FAIRBANKS AREA OFFICE — 1300 College Road, 99701
Frederick M. Andersen (Upper Yukon Area Management Biologist)
Louis H. Barton (Upper Yukon Research Project Leader)

---

[1]The Regional Information Report Series was established in 1987 to provide an information access system for all unpublished divisional reports. These reports frequently serve diverse and ad hoc informational purposes or archive basic uninterpreted data. To accommodate needs for up-to-date information, reports in this series may contain preliminary data.

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

LIST OF FIGURES

LIST OF TABLES

LIST OF TABLES (Continued)

APPENDIX TABLES

APPENDIX TABLES (Continued)

APPENDIX TABLES (Continued)

APPENDIX TABLES (Continued)

ATTACHMENTS

PREFACE

This report presents current and historical information concerning the management of commercial and subsistence fisheries in the Yukon area. Data from a number of 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. The report is organized into the following major sections:

1. Area Introduction. This section presents a detailed description of the area, inhabitants, fishery resources, fisheries and management practices.

2. Area Report, 1987. This section presents a comprehensive report of the current year and makes comparisons with previous years.

In order to facilitate use of this report, tabular data has been separated into current year tables and appendix tables where annual comparisons are made. Upper Yukon area commercial chum salmon catches in current year and appendix tables report salmon sales in the round (whole fish) or as pounds of roe sold, as documented by fish tickets. Roe directed harvests of summer chum salmon through 1979 and fall chum salmon through 1987 were at levels which resulted in total carcass utilization by subsistence. Total utilization tables (commercial plus subsistence) were prepared by totaling commercial harvests of chum salmon in the round and subsistence chum salmon harvests for these years. Total utilization estimates of summer chum salmon from 1980 through 1987 were expanded from harvest information including commercial fish ticket information for pounds roe and numbers of fish in the round, subsistence harvest information, and sex ratio information from a Department operated fishwheel near Kaltag (1983-1985). The sex ratio information was used to expand commercial roe harvest receipts to account for males taken incidental to the roe directed commercial fishery.

The following is an explanation of how commercial fishing effort and catch per unit effort data, presented throughout this report, have been derived:

Boat (or fisherman) hours have been computed, arbitrarily assuming that if a fishing boat delivers in any fishing period, it fished the entire period for as many hours as were open to commercial fishing.

Catch per fisherman (or boat) hour is obtained by dividing the total fishermen hours into the catch for the corresponding period of time.

Total fishermen (or boats) is the total number of fishermen making deliveries, irrespective of how many deliveries were made or 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.

Historic catch trends of total utilization are documented in Appendix Table 1. Annual Management reports prior to 1987 identify the catch as being taken for commercial or subsistence use, as well as to total utilization.

AREA INTRODUCTION

Description of Area

The Yukon management area includes all waters of the Yukon River and its tributary streams in Alaska and all coastal waters from Canal Point light near Cape Stephens southward to Naskonat Peninsula (Figure 7). The Yukon River is the largest river in Alaska, draining approximately 35 percent of the state, and is the fifth largest drainage in North America (Figure 1). The river originates in British Columbia, Canada, within 30 miles of the Gulf of Alaska and flows over 2,300 miles to its mouth on the Bering Sea draining an area of approximately 330,000 square miles. With the possible exception of a few fish taken at the mouth or adjacent coastal villages, only salmon of Yukon River origin are harvested in this area.

Fishery Resources

All five species of Pacific salmon are found in the Yukon River drainage (Figure 1) with chum salmon (Oncorhynchus keta) being the most abundant. It is estimated that chinook (Oncorhynchus tshawytsha), coho (Oncorhynchus kisutch, pink (Oncorhynchus gorbuscha), and sockeye (Onchorynchus nerka) salmon follow in order of abundance.

Chum salmon are found throughout the Yukon River drainage. Summer and fall chum salmon are two distinct runs of chum salmon which enter the Yukon River. Summer chum salmon are chiefly characterized by: earlier run timing (early June-mid July), rapid maturation in freshwater, smaller size (average 6-7 pounds), and larger population. Summer chum salmon spawn primarily in run-off streams in the lower 500 miles of the drainage and in the Tanana River system (Figures 2, 3 and 4). Fall chum salmon are mainly distinguished by: later run timing (mid July-early September), robust body shape and bright silvery appearance, larger size (average 7-8 pounds) and smaller population. Fall chum salmon spawn in the upper portion of the drainage in streams which are spring fed, usually remaining ice- free during the winter. Major fall chum salmon spawning areas include the Tanana, Chandalar and Porcupine River systems and also various streams in the Yukon Territory including the main stem Yukon River (Figures 4, 5 and 6).

Chinook salmon of the Yukon River are the largest species ranging from 2-90 pounds and averaging 20-25 pounds (sampled from the commercial fishery, large mesh gill nets). Spawning populations of chinook salmon have been documented in the Archuelinguk River located approximately 80 miles from the mouth of the Yukon River and as far upstream as the headwaters of the drainage in the Yukon Territory of Canada, nearly 2,000 miles from the mouth (Figures 2-6). Chinook salmon enter the mouth of the Yukon River soon after breakup during late May-early June and continue through mid-July.

Coho salmon enter the Yukon River during late July through mid- September, average about seven pounds in weight and spawn discontinuously throughout the

drainage. The major coho salmon spawning concentrations documented to date occur in tributaries of the upper Tanana River drainage (Figure 4).

Pink salmon enter the lower river during late June-mid July, average approximately 3 pounds in weight and essentially spawn in the lower portion of the drainage (downstream of the village of Grayling) (Figure 2). Pink salmon have been caught in the main stem Yukon River upstream as far as Ruby (river mile 601). In recent years large runs of pink salmon have occurred during even numbered years (1982, 1984, and 1986).

Sockeye salmon are uncommon in the Yukon River and only a few individual salmon are caught each year. Sockeye salmon have been reported in the main Yukon River upstream to Rampart (mile 763). There have been reports of sockeye salmon spawning areas being located along the Innoko River drainage.

Herring (Clupea pallasii) are found in Hooper Bay, Kokechik Bay and Scammon Bay (Figure 21). Spawning populations occur primarily in the Cape Romanzof area (Kokechik Bay and Scammon Bay) where suitable spawning habitat is available (rocky beaches, kelp (Fucus). Spawning usually occurs from mid-May through mid-June.

Other species common to the freshwater and or coastal marine habitats are listed in Table 1.

Water Quality

Water quality and spawning habitats in the area have been largely preserved in their original condition. Pollution, logging, dam construction and mining activities, except in a few locations, have been to date minimal or nonexistent. It remains to be seen what impact recent oil development activity will have on water quality and fishery resources in the area.

District Boundaries

Commercial salmon fishing is allowed along 1,200 miles of the mainstem Yukon River and the lower 200 miles of the Tanana River. The present district boundaries were established in 1961 and redefined in 1962, 1974 and 1978. The commercial fishing area is divided into six districts for management and regulatory purposes (Figure 7). The lower Yukon area includes the coastal waters of the area and that portion of the drainage from the mouth to Old Paradise Village, river mile 301 (lower three districts). The upper Yukon area is that portion of the drainage upstream of Old Paradise Village to the U.S./Canada Border including the Tanana River (upper three districts). The districts are further subdivided into 10 subdistricts and 25 statistical areas for management purposes. Figures 8, 9, and 10 show the lower three districts statistical area charts. Figures 11, 12, 13, and 14 show the upper three districts statistical area charts. Yukon River mileages are listed in Table 2.

Commercial Salmon Fishery History and Description

U.S./Canada-Treaty Negotiations

In the spring of 1985, the governments of the United States and Canada ratified the Pacific Salmon Treaty; although Yukon River fishery issues are not specifically addressed in this document, one provision of the treaty required the two countries to begin negotiations regarding salmon stocks which originate in Canada.

Since that time, United States (U.S.) and Canadian delegations have met in briefing sessions and in five formal negotiation sessions. The U.S. delegation is composed of a Department of State attorney acting as Chief Negotiator or his alternate, representatives of the Department of Fish and Game, United States Fish and Wildlife Service (USFWS), and National Marine Fisheries Service (NMFS), and 14 members of the public who represent subsistence and commercial fishing interests on the Yukon River.

Little progress has been made in these negotiations because of sharp differences on questions whether a Yukon River agreement should be part of the Pacific Salmon Treaty and, more specifically, on questions of salmon allocation between the two countries.

One benefit of these negotiations is the formation of a Joint Technical Committee composed of fishery scientists from both nations. The work of this committee is resulting in the development and exchange of important fishery data and a better understanding of salmon conservation requirements.

The schedule and agenda for further negotiations have not yet been established.

Historical Catch Trends and Status of Stocks

The first recorded commercial salmon harvest in the drainage dates back to 1903 when 70,000 pounds of chinook and chum salmon were taken in the Yukon Territory, Canada. A commercial fishery for these species still exists in Yukon Territory, primarily downstream of Dawson.

The first recorded commercial salmon harvest in Alaska was in 1918 when Carlisle Packing Company operated a floating cannery at Andreafsky (now St. Marys). Relatively large catches of chinook, coho and chum salmon were made during the first four years of this fishery. Since restrictions were placed only on commercial fishing inside the river's mouth, a majority of the catch was made in "outside" waters. Because of the existence of a large upriver subsistence fishery, the early commercial fishery met opposition and was closed completely during 1925-1931. Commercial fishing for chinook salmon was resumed at a much lower level in 1932, and this species has been taken commercially each year since then. Only chinook salmon were harvested on a sustained basis prior to statehood (1959). During the period 1918-1959 chinook salmon commercial catches averaged approximately 30,000 fish annually. Since 1921, commercial catches of chum and/or coho salmon have been made during 1952-54, 1956 and since 1961.

Since the 1950's commercial salmon fishing has been permitted only upstream from the mouth of the Yukon River and in the vicinity of Black River. During the 1954-1960 period, a 65,000 chinook salmon quota was in effect for the river. Of this total, not more than 50,000 could be taken below the mouth of the Anuk River, 10,000 in the area between the mouths of the Anuk and Anvik Rivers and 5,000 upstream from the Anvik River. During these years, fishing was allowed for five and one-half days a week until specific quotas were obtained.

Under new regulations established by the Department in 1961, the annual chinook salmon commercial harvest for the entire area averaged 104,280 for the period 1961-1970 (Appendix Table 2). This average compared to 63,023 for the previous period, 1952- 1960, represents an increase of 66 percent. During the period 1971-1976 catches declined, averaging 88,067 fish annually because of below average runs (except 1971) and regulatory restrictions. In 1975 the chinook salmon commercial catch of 63,838 was the smallest since 1960. Restrictions placed on the commercial fishery during the 1970's generally resulted in improved escapements. Above average escapements occurred in most streams during 1977-1981. In 1980 and 1981 record escapements were observed in the majority of the major index areas. During 1982-1987 chinook salmon escapements were below desired levels in upper Yukon (Yukon Territories) spawning areas and during most years (1982-1984) in middle Yukon (Tanana and Koyukuk River systems) spawning areas.

To optimally harvest all stocks it is necessary to know the total return drainage wide as well as the timing of various stocks which make up the total return and the contribution of these stocks to the various fisheries. Knowledge has recently become available in determining some of these factors through sharing of data from projects conducted by the Department and by the Canadian Department of Fisheries and Oceans (DFO) as established through the U.S./Canada negotiations.

Stock composition modeling, utilizing analysis of chinook salmon scale patterns collected from fishery and spawning ground samples since 1982, has provided for allocation of the catch to three general areas of origin. These

areas of origin include: 1) lower - tributary streams which drain the Andreafsky hills, and Kaltag Mountains, 2) middle - tributary streams of the Tanana and upper Koyukuk Rivers, and 3) upper - mainstem Yukon River and tributary streams that drain the Canadian portion of the system.

D.F.O. conducts a chinook salmon tagging program capturing fish for tag application by fishwheel just upstream of the U.S./Canada border. Recapture is made upriver by the Canadian commercial fishery. A population estimate is made based on the ratio of tagged to untagged fish in the commercial catch. Escapement into Canada is the difference between the estimated number of fish crossing the border and all known harvests. The Department has conducted a data review of this project and to date no major problems have been detected with the chinook salmon escapement estimates. Recommendations regarding methods to improve the reliability of the tagging estimates were made to the Canadians by the Department in 1987.

Scale pattern analysis information, collected from fishery catches and spawning areas, provide for an estimate of stock specific total return and exploitation rates of Canadian origin chinook salmon. In order to maintain run size at current levels it is necessary to maintain an exploitation rate at or below 67%. This would allow at least 33% of the run to spawn. The estimates of exploitation rates of Canadian origin stocks has ranged between 67% and 91% during 1982 to 1987. These levels of exploitation are excessive, and if not reduced will lead to a decline in the abundance of Canadian origin chinook salmon stocks.

Exploitation rates of lower and middle river origin chinook salmon have been calculated. Due to the number of assumptions that were required to achieve these estimates, the findings for some years are questionable. In general, it is thought that middle river origin chinook salmon have been over-exploited during some years, with exploitation rates of lower river stocks below the 67% level.

Since 1977, due to increased efficiency of commercial fishermen and in some years due to above-average run strength, chinook salmon commercial catches

ranged from 99,168 to 158,018 fish during 1978-1987, averaging 127,321 fish annually. The greatest commercial catch ever made in the area was in 1981.

Chinook salmon of western Alaska origin have been intercepted yearly by the Japanese mothership and landbased gill net fisheries (Appendix Table 39). Revised estimates indicate an average of 141,000 chinook salmon were taken during 1975-1983. Yukon River chinook salmon comprised the majority of western Alaska stocks taken in the Bering Sea mothership catches. In 1980 a total of 438,000 western Alaska chinook salmon was estimated to have been taken in these fisheries which exceeded the domestic commercial catch in western Alaska that year.

Although reported foreign catches have decreased in recent years, it is believed that high seas fishing mortality including gill net dropouts (estimated to be 30% of the reported catch in one study) and possible underreporting of catches result in continued losses of western Alaska fish.

The catch of chinook salmon by the Japanese land based gill net fisheries has not been available since 1983. The reported chinook salmon catch made by the Japanese mothership fishery in 1987 was 20,000 fish. This was below the recent five and ten year catches of 32,000 and 77,000, respectively.

The incidental harvest of chinook salmon in foreign and joint venture trawl fisheries has decreased in recent years. A domestic factory trawl fishery has been recently initiated in the southeastern Bering Sea, however, the incidental salmon catch is unknown.

Since statehood the Yukon River commercial chum salmon fishery has steadily developed especially during the 1970's. During the period 1961-1965 commercial catches averaged 25,448 while during the same period subsistence chum salmon catches averaged 416,585. During the period 1966-1970 subsistence catches decreased, averaging 217,951 chum salmon. As the subsistence fishery declined and regulations were relaxed, coupled with the expansion of the fall chum salmon commercial fishery, the commercial catches increased, averaging 145,505 during 1966-1970. The development of the summer

chum fishery and expansion of the upriver commercial fishery resulted in commercial chum catches averaging 644,320 during the period 1971-1977. In response to chum salmon market conditions a roe directed commercial fishery was initiated during 1978 (primarily for summer chum salmon) in conjunction with the previously established fishery with total commercial harvests averaging 1,033,205 fish in the round and 160,133 pounds roe during the period of 1978 to 1987. The largest chum salmon catch in the history of the Yukon River commercial fishery occurred in 1981 when 1,473,389 fish and 200,353 pounds roe were taken (Appendix Tables 3 and 4).

Prior to the mid-1960's summer chum salmon were used primarily for subsistence, mostly for sled dog food. As the snow machine replaced the dog sled, subsistence fishing for summer chum salmon declined. Beginning in 1967, commercial fishing restrictions regarding summer chum salmon have been liberalized as the dependence for subsistence declined. The Yukon River summer chum salmon commercial harvest has increased sharply as a result of regulation changes (e.g. mesh size specifications and earlier openings of the fishing season), increased fishing effort (including expansion of the upper Yukon fishery), the availability of processing and tendering facilities, higher prices paid to fishermen, the development of Japanese markets, and the occurrence of very large runs during most recent years. In 1967 only 10,935 summer chums were taken commercially while in 1981 a record 1,006,938 fish and 189,068 pounds roe were taken (Appendix Table 3 and Appendix Table 6). Since the recent development of the fishery, catches have averaged 755,604 fish and 153,834 pounds roe annually (1978- 1987). The majority of the harvest takes place in Districts 1, 2 (fish in the round only) and 4 (primarily roe).

The major summer chum salmon spawning tributaries include the Andreafsky and Anvik Rivers and several others upstream to and including those of the Koyukuk River drainage. Department tag and recovery population estimates indicated total runs of 3.2 and 1.6 million fish in 1970 and 1971, respectively. In 1975 the total Yukon River run was estimated in excess of 3.5 million fish based on documentation of commercial and subsistence catches and aerial survey estimates. In 1981, the Yukon River summer run was

estimated in excess of 5.6 million fish. In the Anvik River, escapements of over 1 million summer chum salmon were estimated in 1975, 1981, 1985, and 1987. Yukon River summer chum salmon escapements have been good in recent years, with the exception of 1987.

The commercial fishery for fall chum salmon in the Yukon River began in the early 1960's. During the 1961-1968 period, catches averaged 36,185 fish annually and since 1969 (1969-1987) catches have averaged 244,018 fish. Roe sales were initiated in 1978 and have averaged 6,300 pounds annually (1978-1987), (Appendix Table 4). Fall chum salmon are in great demand and are harvested in all fishing districts because of their good quality (bright, silvery appearance, large size, robust body shape and high oil content), which is related to their destination to spawning areas in the upper portion of the drainage. The majority of the fall chum salmon commercial catches are taken in the lower two districts (Appendix Table 4). The largest fall chum catch occurred in 1981 when 466,451 fish and 11,285 pounds roe were taken.

In that portion of the Yukon River drainage upstream of the mouth of the Koyukuk River, fall chum salmon are of more importance for subsistence than summer chums. It is estimated that fall chums comprise 60-75% of the total subsistence harvest in this area.

Tagging studies conducted from 1977 to 1979, and run timing information provides evidence which suggests that the early run (late July-early August) of fall chum salmon are bound for the Porcupine River system and Yukon Territory streams. The late run of fall chum salmon (mid- August-early September) are thought to be primarily destined for the Tanana River.

Run magnitudes, based on comparative catch data and limited escapement data, have fluctuated sharply depending on the brood year strength. Large runs were generally experienced in 1971, 1975, 1979, 1981, and 1985 while small runs occurred in 1973, 1976, 1980, 1982-1984 and 1987. Upper Tanana River drainage escapements in general appear more stable and experience less fluctuation than the Porcupine River and Toklat River systems. For example, aerial survey escapement estimates in the Fishing Branch River (Porcupine

River drainage) have ranged from 78,600 (1975) to 5,600 (1984) and the Toklat River (upper area) have ranged from 96,600 (1979) to 3,300 (1982).

In order to obtain a better understanding of fluctuations in fall chum salmon abundance, trends have been monitored in harvests and escapements for Yukon River fall chum salmon for the years 1974 through 1987 (Appendix Table 36). In order to establish a base for escapement information, an index has been established. The escapement index is defined as the escapement population estimated for the Sheenjek, Fishing Branch, upper Toklat and Delta Rivers combined. While each of these four components is a total season population estimate and not just a survey count, the combined estimate is still just an escapement index for the overall Yukon River drainage since many known fall chum salmon spawning populations are not included. Lack of a historical data base prohibits including such spawning areas as the Chandalar, Kluane, mainstem upper Yukon, mainstem upper Tanana Rivers, and several sloughs off of the Tanana River. Additional fall chum salmon spawning populations have been documented, and several areas are suspected.

During the 1987 season an overall fall chum salmon commercial guideline harvest range from 0 - 160,250 was in effect as implemented by the Alaska Board of Fisheries during their December, 1985 meeting and re-established during the April, 1987 meeting. This guideline harvest range reduction from the 145,500 - 320,500 range, which was in effect from 1979 to 1985, was made in anticipation of poor returns of fall chum salmon through the 1988 season. Regulations affecting fall chum salmon harvest levels were initially introduced in 1974 when the Alaska Board of Fish and Game established quotas of 200,000 chum salmon for the lower three districts (combined) and 50,000 combined chum and coho salmon for the upper three districts.

Yukon River chum salmon, in addition to other western Alaska stocks, are intercepted by the U.S. South Unimak - Shumagin Islands commercial fishery in June as demonstrated by tagging studies. Annual (1970-1979) catches of this interception fishery average 277,000 chum salmon (all stocks combined). However in recent years catches have increased sharply: 1980 (528,000 fish), 1981 (575,000 fish), 1982 (1,094,000 fish), 1983 (784,000 fish), 1984

(337,000 fish), and 1985 (479,000 fish), 1987 (344,000 fish), 1987 (443,000 fish).

Coho salmon runs of the Yukon River are of lesser magnitude than fall chum salmon and are taken incidental to the commercial fishery for fall chums. Coho catches have averaged 35,197 fish during the period 1977-1987 (Appendix Table 5).

Commercial salmon catches by district and/or statistical area since 1961 are presented in Appendix Tables 2-6,9,10, and 16-18.

The relatively recent development and expansion of the commercial salmon fishery has enabled many area residents to obtain a cash income. In recent years (1978-1987) fishermen have received approximately 6.7 million dollars annually (Appendix Table 24). The majority of commercial fishermen are Eskimo and Athabascan Indian residents of the Yukon River drainage (Table 5).

Most fishermen operate small outboard powered skiffs of 18 to 20 feet in length and do not use gill net rollers, power reels, etc. of any type. In the Yukon area set gill nets, drift gill nets and fishwheels are legal forms of commercial salmon fishing gear.

The majority of the salmon catch is presently processed as a fresh/frozen product in contrast to earlier years when canning and salting were of greater importance (Appendix Table 23). Salmon are processed at shore-based or floating operations with a portion of the catch transported via aircraft outside the area for processing. In the upper Yukon area production of salmon roe (purchased directly from fishermen) has increased in recent years (Appendix Tables 3 and 4).

Lower Yukon Area

The lower Yukon area consists of three districts: District 1 (mouth to Anuk River including Black River), District 2 (Anuk River to Toklik), and District 3 (Toklik to Old Paradise Village) (Figures 8-10).

Since the onset of the commercial salmon fishing in 1918, the majority of the Yukon River harvest has occurred in the lower river area (primarily Districts 1 and 2) where fishing and processing effort is concentrated and fish quality is optimal. Although the summer chum fishery has developed in recent years, the lower river fishery during June is still primarily managed for the chinook salmon run.

Beginning in 1961, when chinook salmon catch quotas were eliminated for Districts 1 and 2, and continuing through 1981, these fisheries were regulated by scheduled weekly fishing periods with the season opened by date. Fishing time during the chinook salmon season was allowed for four days a week during 1961-1967, but was reduced to 3-1/2 days a week beginning in 1968, to 3 days a week in 1974 and to 2-1/2 days a week in 1977. Beginning in 1981 a 60,000 to 120,000 chinook salmon guideline harvest range was established for Districts 1 and 2 (Appendix Table 15). Effective for 1982, fishing periods during the chinook salmon season in Districts 1 and 2 were established by emergency order. This was done to provide for adequate chinook salmon escapements in response to increasing fishing effort and efficiency. The "chinook salmon season" (unrestricted mesh size) in these districts usually opens by emergency order between June 5- 15 and is closed by emergency order during late June or early July depending on run timing and magnitude. Fishing periods of 24 hours duration during 1982-1986 generally occurred twice weekly. During some years District 2 received less fishing time than District 1.

Commercial fishing effort increased sharply during 1961-1975 with license registration for set gill nets more than doubling while drift gill net gear tripled. Set gill nets are commonly used near the river mouth, but drift gill nets are the predominant gear type elsewhere. The best measurement of effort is the number of units of commercial fishing gear operated each year since fishermen have commonly used more than one type of gear during the season (Appendix Tables 7 and 8). With the advent of the Limited Entry program in 1976, fishing effort in terms of the number of participants

stabilized, but efficiency increased. In 1987 a total of 711 CFEC gill net permits was issued (Appendix Table 7).

During 1975-1980, prior to establishment of the 60,000-120,000 guideline harvest range, chinook salmon harvests in Districts 1 and 2 averaged 119,200 fish. For the period 1981-1986, District 1 and 2 chinook salmon harvests have averaged 126,600 fish.

In District 3, a 1,800-2,200 chinook salmon guideline harvest range was established in 1979. The commercial salmon fishing season in District 3 opens by emergency order. Fishing is allowed under a schedule similar to Districts 1 and 2. Since 1979 the District 3 catch has averaged 3,400 fish annually (1979-1986).

Sale of other species of salmon captured during the chinook salmon season, excluding the 1920's, has been allowed only since 1967 in the area of the present lower two districts. The incidental catch of summer chum salmon was limited during the chinook salmon season as fishermen could use only gill nets of eight inch minimum stretched mesh. However, beginning in 1970, each fisherman could substitute up to 50 fathoms of gill net of any mesh size in Districts 1 and 2. In 1973 all mesh size restrictions were lifted during the chinook salmon season (from June 1 through early July) in order to allow greater opportunity to use small mesh nets which are selective toward the more abundant summer chum salmon. The majority of fishermen continue to fish the larger mesh chinook salmon nets during the chinook salmon directed periods (unrestricted mesh size). Comparative lower Yukon area chinook and summer chum salmon catches by mesh size are presented in Appendix Table 11.

Since 1961 the commercial fishing season in the lower Yukon districts, except during the 1987 season, has been reopened following the closure of the chinook salmon season to allow harvest of fall chum and coho salmon. Prior to 1973, the closure between the chinook salmon (summer) and the fall chum - coho salmon (fall) seasons (often during late June and most of July) was primarily for the purpose of insuring an adequate supply of summer chum

salmon for upriver subsistence fishermen. This closure also provided protection for the late stages of the chinook salmon run.

Subsistence fishing for summer chum salmon declined following the 1966 season. Harvests prior to 1966 were over 300,000 fish annually, while during the period from 1966-1980 harvests were generally under 200,000 fish annually. Documented subsistence catches since 1981 suggest a trend of increasing utilization (Appendix Table 29).

The Alaska Board of Fisheries liberalized regulations to provide for harvest of summer chum salmon surplus to subsistence and escapement requirements. A regulation was promulgated in 1973 specifying gill nets of only 6-inch mesh or less may be fished after a specified date in early July in Districts 1 and 2 concurrent with continuation of the summer season to increase harvest of summer chum salmon. Use of small mesh gill nets in early July allowed a greater harvest of summer chums and also minimized the chinook salmon catch (Appendix Table 11). Beginning with the 1976 fishing season a regulation was promulgated which established a flexible range of dates from June 27 to July 5 in Districts 1 and 2 (and July 5-15 in District 3) after which only gill nets of six inch maximum mesh size may be used. Effective for the 1985 fishing season, a regulation was promulgated which eliminated specific dates and implemented emergency order authority in establishing restricted mesh size periods (six inch maximum) in Districts 1, 2, and 3. Additionally, the Board of Fisheries issued a directive to the Department to provide for special summer chum salmon directed fishing periods (6 inch maximum mesh size) prior to the end of the chinook salmon season if the summer chum salmon run is average or better in strength.

In recent years (1977-87) the lower Yukon area commercial summer chum salmon catch has averaged 562,842 fish annually (Appendix Table 3).

Fall chum salmon have been harvested in the lower Yukon area beginning in 1961. Since expansion of the fishery in 1969 lower Yukon area fall chum catches have averaged 194,751 fish annually (1969-86) (Appendix Table 4).

In 1974 a 200,000 fall chum salmon quota (after mid-July) was implemented for the combined lower three districts. Also, fishing time was reduced from four to three days a week in Districts 1 and 2. These actions were necessary to stabilize the catch in view of increased fishing effort and improved efficiency and to provide for a harvest in the newly established upper Yukon area fishery. In 1979, fishing time was reduced further to two days a week and the 200,000 quota was replaced by a flexible guideline harvest range of 120,000 - 220,000 fall chum salmon.

Effective for the 1983-1985 seasons, fishing time was regulated by emergency order in Districts 1, 2 and 3. Two-12 hour fishing periods per week were established by emergency order in Districts 1 and 2, except that fishing time remained at two days a week for set net fishermen in the coastal area of District 1 (Figure 15). Fishing time in District 3 was reduced from 3 to 2 days a week. Also a one week season closure in Districts 1, 2 and 3 during late July was established. Fishing regulations were further restricted for the 1986 and 1987 season by regulation through establishment of the Yukon River Fall Chum Salmon Management Plan in anticipation of very poor returns of fall chum salmon. A season closure of July 15 was established to protect the early portion of the fall chum salmon run and to provide the Department an opportunity to evaluate run strength. Additionally, the guideline harvest range was reduced to 0 - 110,000 fall chum salmon for Districts 1,2 and 3. The commercial fishery was to be implemented by emergency order authority. Under this management plan there is a possibility of no commercial fall chum fishery. If a fishery is initiated, based on the assessment of in-season run strength, fishing period duration will be restricted from that of previous years.

The harvest of coho salmon in the lower Yukon area is incidental to the harvest of fall chum salmon, with the season ending on achievement of the appropriate harvest of fall chum salmon. The coho salmon run peaks during mid to late August in the lower river. Lower Yukon coho salmon catches since 1971 have averaged 35,197 fish annually (1978-1987) (Appendix Table 5).

Nearly all of the lower Yukon River salmon catch is destined for markets as a fresh-frozen product. Freezer ships and barges are located in the vicinity of Emmonak and Mountain Village. Fresh salmon is transported by aircraft from St. Marys and Marshall annually, and from Russian Mission and the Paimuit-Holy Cross area during some seasons for further processing. A hard salting operation is located at Black River.

Upper Yukon Area

For regulatory and administrative purposes, the upper Yukon area is divided into three districts: District 4 extends from Old Paradise Village upstream approximately 360 miles to the mouth of Illinois Creek near Kallands; District 5, from the mouth of Illinois Creek upstream to the U.S./Canadian border (approximately 550 miles), and District 6, the Tanana River drainage, of which the lower 225 miles is open to commercial fishing (Figures 11-14).

Prior to 1974, the upper Yukon area (above the confluence of the Koyukuk River) was designated as a single district (District 4). By regulation, commercial fishing was allowed 7 days per week until the quotas of 2,000 chinook salmon and 2,000 chum and coho salmon (combined) were taken. These quotas were established for the purpose of allowing a very limited commercial utilization which had occurred for many years.

In recent years, however, the upriver commercial fishery has expanded. Fishing effort nearly doubled from 1972 to 1973, and processors developed outside markets, due in part to the steadily increasing price of salmon the market was experiencing. In recognition of the developing upriver commercial fishery and the desire of fishermen in the upper portion of the drainage for increased participation, the Board of Fish and Game adopted several major regulation changes prior to the 1974 fishing season. These new regulations provided for substantial increases in the upriver catches, reduced gear conflicts and, at the same time; made provisions for allowing escapement needs to be met:

1. District 4 was reduced in size and redefined as that portion of the Yukon River drainage from the mouth of the Bonasila River to the mouth of Illinois Creek at Kallands.

2. Two new districts were added: Districts 5 and 6.

3. Salmon catch quotas were established for the upper Yukon area as follows:

   a. District 4: 1,000 chinook salmon and after August 15, 10,000 chum and coho salmon combined for the area.

   b. District 5: 3,000 chinook salmon and after August 15, 25,000 chum and coho salmon combined for the area.

   c. District 6: 1,000 chinook salmon and after August 15, 15,000 chum and coho salmon combined for the area.

4. In Districts 4, 5, and 6 the weekly commercial fishing period was reduced from 7 to 5 days per week.

Since that time the Board of Fisheries has enacted a number of major regulation changes in the upper Yukon area:

1. Weekly fishing periods were reduced in all districts (except the upper portion of district 5) from 5 to 4 days per week, and split-period fishing schedules were established. In District 4, the commercial fishing season opens by emergency order between June 10 and June 25.

2. Chinook salmon and fall chum and coho salmon quotas were replaced by flexible guideline harvest ranges: District 4: 2,250-2,850 chinook salmon and 0-20,000 fall chum and coho salmon; District 5: 2,700-3,300 chinook salmon and 0-20,000 fall chum and coho salmon; and District 6: 600-800 chinook salmon and 0-10,250 fall chum and coho salmon.

3. District 4 boundaries were redefined and new subdistricts created to allow for stock-specific management of fall chum and coho salmon.

4. New subdistricts within District 5 were created to achieve better balanced harvests and escapements.

Because of the common origin of salmon stocks which are harvested throughout the length of the Yukon River, the commercial and subsistence fisheries in the middle and upper river districts cannot be considered separate or distinct from those in the lower portion of the drainage. They do, however, differ in several important respects.

For reasons of relative abundance, flesh quality, and the existing regulation structure, the fall chum salmon run is the target species of the commercial fishery in Districts 5 and 6.

The summer chum salmon run is of paramount importance in District 4 and comprises the majority of the total upriver commercial harvest (78% of fish sold in the round, 98% of roe sales). Unlike the lower river fisheries, relatively few summer chum salmon are taken commercially in Districts 5 and 6. Summer chum salmon flesh is difficult to market because of their low abundance, advanced state of sexual maturity, and consequent poor quality; however, roe quality of summer chums is judged by the industry to be excellent.

Fishwheels are the primary type of gear for harvesting summer chum salmon because of local fishing conditions, efficiency, and relative ease of operation. Fishwheels account for roughly 95% of the commercial harvest of that species in the upper Yukon area. In contrast, local river conditions and regulations dictate the exclusive use of set and drift gill nets in the lower Yukon area.

The last major difference between the lower and upper Yukon area fisheries is their relative size, both in numbers of fishermen and catch. Because of the nature of the commercial fishery in Districts 4, 5 and 6 and the absence of

major summer chum salmon producing streams in the upper portion of the drainage, the commercial salmon harvest has averaged approximately 12% of the total area harvest of fish sold in the round and 100% of the roe sales (1982-1987). During the same time period, the upper Yukon districts have had an average of 152 participating fishermen or approximately 19% of the Yukon area total (Appendix Table 7). Chinook salmon are of lesser importance to the commercial fisheries in the three upper districts; the total harvest guideline range allocated by the Board of Fisheries is 5,550 to 6,950 chinook salmon (Appendix Table 15). In most years the guideline harvest range is not met in District 4, as most fishermen choose to retain chinook salmon for subsistence use. In the Tanana River (District 6), the upper end of the chinook salmon guideline harvest range is normally taken by late July, and in most years the season remains closed until early to mid- September. A relatively intense fishery for chinook salmon has developed in the lower portion of District 5, and considerable (gill net) effort occurs during July.

The majority of commercially caught chinook salmon are transported to Fairbanks and other population centers for primary processing and sold to wholesalers outside the state as a fresh- frozen product. The balance of the chinook salmon catch is sold to local supermarkets and restaurants. Most fall chum salmon harvested in these districts are tendered by boat or single-engine aircraft from collection points along the river and are then trucked or flown to processing plants in Manley, Galena, or Nenana for processing. A portion of the fall chum harvest is marketed as a fresh-frozen product, and small quantities of chinook and fall chum salmon are smoke-cured and sold as "strips", a local specialty product. In addition, limited quantities of chum and coho salmon taken commercially are dried and sold as dog food.

The upper Yukon commercial fishery developed at a time (mid to late 1970's) when salmon runs on the west coast were generally depressed. For this reason, processors were able to overcome quality problems and transportation costs and find ready markets for their product. In recent years, however, salmon runs throughout Alaska have rebounded, and processors are now having to compete with higher quality sockeye and chum salmon. Prices paid for upriver chum salmon (primarily summer chum salmon) have not kept pace with

inflation resulting in development of roe directed fisheries initiated in 1978 in some areas (particularly Subdistrict 4-A).

To varying degrees between years and districts, markets for chum salmon in the round remain available for higher quality male summer chum salmon and fall chum salmon (Appendix Tables 3,4, and 6). Carcasses resulting from roe directed fisheries appear to be fully utilized for subsistence purposes except for District 4 summer chum harvests since 1980. Total utilization of District 4 summer chum salmon harvest have been estimated since 1980 based on fish ticket sales (either in the round or as roe), estimated numbers of males taken incidental to the roe directed fishery as documented by the Department operated fishwheel located near Kaltag from 1983 to 1985, and subsistence survey results. It is estimated that approximately 336,000 summer chum salmon have been harvested annually (1982-1987) from District 4 in association with the commercial fishery. It was estimated that the harvest of summer chum salmon in District 4 in 1987 was 209,800 (Appendix Table 6). A portion of the carcasses of this catch is utilized for subsistence, however, significant waste has been documented.

Subsistence Utilization

There are approximately 10,000-15,000 rural residents in the area, the majority of whom reside in excess of 45 small villages scattered along the coast and major river systems. Nearly all of these native people are dependent to varying degrees on fish and game resources for their livelihood.

Subsistence fishermen operate gill nets largely in the main rivers and, to a lesser extent, in the coastal marine waters, capturing mainly salmon, whitefish and sheefish. Fishwheels take considerable numbers of salmon in the upper Yukon and Tanana Rivers. Beach seines are occasionally used near spawning grounds to catch schooling or spawning salmon or other species of fish. Traps and fish weirs of various designs are also used, mainly in the fall and winter months, to capture whitefish, blackfish and burbot. Sheefish, pike, char and "tomcod" (saffron cod) are frequently taken through the ice by hand lines. Dip nets are used in late May-early June to take

smelt in the delta area and in late October-early November to take lamprey in the main Yukon River downstream of Grayling.

There is usually little intentional wastage of the fish taken for subsistence purposes. The major portion is sun dried or smoked for later consumption while the head and viscera may be fed to sled dogs.

Comprehensive annual surveys of the Yukon River subsistence salmon fishery were initiated by the Department in 1961. Data obtained cannot be easily compared with that of earlier years which was often incomplete. Methods and coverage of these earlier surveys were not documented and their accuracy cannot be determined. However, there are records indicating that in excess of one million salmon (mainly chums) were taken for subsistence in some years during the early 1900's and even as late as 1940. These fish were used to feed sled dogs used for transportation.

The Department's subsistence fishery surveys (personal interview, catch calendar, and/or catch questionnaires) obtain catch, effort and other associated data from villages and fish camps along the main river in Alaska, including portions of the Tanana River and Chandalar River. Survey methodology and technique has varied from year to year which influences subsistence harvest estimates, however, it is felt that estimates accurately reflect harvest trends. In recent years, the Department has conducted surveys of Koyukuk River villages. Catch data from the Canadian portion of the drainage has been supplied by personnel of Government of Canada - Department of Fisheries and Oceans (Whitehorse office) since 1962.

About 1930 the airplane began replacing the sled dog as mail and supply carrier, starting the gradual decline of the subsistence salmon fishery. Subsistence catches declined through the 1970's as increased welfare payments and employment opportunities, including commercial fishing activities, have become available to rural residents. Declines in subsistence catch levels have varied by species. The reduction in subsistence fishing is not necessarily related to fish abundance, but mainly reflects decreases in effort and dependence due to a changing way of life.

To illustrate changes in effort, there were 393 fishwheels operated on the Yukon River in 1918. Fishwheels are very effective if fished properly. A single wheel is capable of taking up to 20,000 or more chum salmon annually. The number of fishwheels recorded during the 1970 survey was an all-time low of 56, a 67% decrease since 1961. However, because of the expansion of the upper Yukon commercial fishery, beginning in 1973, the amount of fishwheel gear used for subsistence has sharply increased (207 units in 1981).

Another very important factor tending to affect subsistence fishing effort during recent years is the increasing use of snow vehicles which may be replacing sled dogs at a faster rate than did the airplane. Since considerable numbers of salmon and other fish are fed to sled dogs, fewer fish are required for subsistence purposes as the canine population declines. In 1961 each fishing family kept an average of 7.7 sled dogs while in 1972 this figure was down to 3.8 sled dogs. However, due to the renewed interest in sled dog racing, the number of dogs per family increased to 6.8 in 1981. The number of snow machines owned by fishing families was documented beginning with the 1967 season, when the average number of snow machines per family was 0.4. By 1973 the number of snow machines had increased to 1.1 per family and increased to 1.4 per family by 1977. The number of snow machines per family remained within that range through 1982, after which time no records were maintained.

Reflecting the above changes in effort and dependency, the subsistence salmon catch has substantially decreased since the early 1960's. The harvest of salmon other than chinook (primarily chum salmon) averaged 416,585 fish during 1961-1965. During the period 1966-1973 catches averaged 209,636 fish, a decrease of 50 percent. However, during 1974-1983, subsistence catches increased, with the catch being utilized mainly for dog food, averaging 364,721 fish during this time period. This increase can be attributed to above-average size runs, especially summer chum salmon, reported and unreported subsistence roe sales (legal 1974- 1977) and increasing numbers of recreational sled dog teams.

Subsistence catches of chinook salmon, which are utilized mainly for human consumption, remained relatively constant during the period 1961-1977, generally averaging 15,000-25,000 per year. During 1977 - 1987 chinook salmon catches have increased substantially, averaging approximately 38,600 fish per year (Appendix Table 28).

The upper Yukon and Tanana River subsistence fishery has differed from that in the lower Yukon due to the limited nature of the upper Yukon area commercial fishery and the subsistence use of resources by urban residents. Easy road and river access increases harvest levels of these areas. Additionally, the total number of subsistence users in the upper Yukon area is slightly more than twice that of the Lower Yukon area. The majority of the subsistence salmon catches are taken in the upper Yukon River area which is illustrated by the catch data presented in Appendix Tables 27-31.

It should be noted that the practice of keeping sled dogs is much more common in the upper Yukon than in the delta area and is considered a major factor affecting fishing effort. It is also likely that the sale of subsistence-caught salmon roe (legal from 1974-1977) increased subsistence chum salmon catches above normal food and domestic use requirements during that period. Subsistence roe sales were not considered a significant factor affecting domestic use harvests in the twelve major villages in the lower Yukon River area.

Subsistence fisheries which target on non-salmon species such as pike, sheefish and whitefish are inadequately documented and their overall significance is not well known. It is thought, however, that residents of the upper Yukon area are much less dependent on these miscellaneous species than are their downriver counterparts.

Escapement Enumeration

A vital link in responsible management of the Yukon River salmon fisheries includes determination of annual salmon spawning escapements. Knowledge of

escapements is needed for several management applications for the following reasons:

- provides information for determining optimum escapement levels or goals for selected spawning areas or management units.

- provides annual escapement trends for evaluation of the effectiveness of the management program and, in turn, the basis for proposing regulatory changes and management strategies.

- provides information for use in projecting returns.

The Yukon River drainage is too extensive for complete comprehensive escapement coverage during any given season. Consequently, low-level aerial surveys from single-engine, fixed- wing aircraft are the primary method used to obtain escapement information. However, comprehensive enumeration studies, by intensified ground surveys, counting towers, weirs, and hydroacoustic projects are also conducted. Regardless of the method utilized, the overall objective of escapement enumeration in the Yukon Management Area is to determine abundance (or often indices of relative abundance), timing, and distribution of spawning salmon populations throughout the drainage; specific objectives may vary by individual project.

There are both advantages and disadvantages related to each type of enumeration method. The more comprehensive studies tend to provide estimates of total salmon escapements and are often less dependent upon weather and water conditions. However, due to costs associated with manning and operating more sophisticated enumeration projects, relatively few have been initiated and have been restricted primarily to selected spawning streams, e.g., the Andreafsky, Anvik, Sheenjek, Salcha, and Delta rivers in Alaska and the Big Salmon, Fishing Branch River and Whitehorse fishway in Canada.

Perhaps the greatest advantage of aerial surveys, as it pertains to the Yukon River drainage (330,000 square miles), is the cost- effectiveness of obtaining escapement information throughout an extremely vast area, most of

which is remote. Another advantage to aerial surveillance is that real or potential habitat-related problems arising from natural or man-induced causes can be readily identified. Among the disadvantages are that results may be highly variable if non-standardized procedures are used.

Variability in aerial survey accuracy is dependent upon a number of factors such as weather and water conditions (turbidity), timing of surveys with respect to peak spawning, type of aircraft, survey altitude, experience of both pilot and observer, and species of salmon being enumerated. It is generally recognized that aerial estimates are lower than actual stream abundance due to these factors. Further, peak spawning abundance measured by aerial survey methods is significantly lower than total season abundance due to the die-off of early spawners and arrival of late fish. Also, aerial estimates in a given stream may demonstrate a wide range in the proportion of fish being enumerated from year to year. Peak aerial counts, however, can serve either as indices of relative abundance for examination of annual trends in escapement or estimation of total escapement from base year data or established expansion factors, or they may be used to apportion tributary spawning distribution to a mainstem total escapement estimate obtained from sonar or tower counts.

Aerial escapement estimates are made of as many spawning streams as possible within the confines of fiscal, manpower, and weather restraints. Representative selected spawning streams or "index areas" have been identified and receive highest priority. Index areas have been designated due to their importance as spawning areas and for use in annual comparison with other unsurveyed streams in the general area. Escapement estimates of index streams not only provide yearly escapement trends but also allow for post-season evaluation of management strategies. Preliminary escapement objectives have been established for some tributary systems which represent the number of spawners considered necessary to maintain the reproductive potential of each stock (Table 17).

Management

The overall objective of the Yukon Area research and management programs is to manage the various salmon runs on an optimum sustained yield basis. Subsistence fishing has been designated by the Alaska State Legislature and the Board of Fisheries as the highest priority use, although, where the dependence upon subsistence fishing has declined, the Department has liberalized regulations to allow development of commercial fisheries.

Management is made difficult by the complexity of the salmon runs and fisheries in addition to the huge size of the drainage. Since most of the fisheries have only developed or expanded in recent years, there is a lack of adequate comparative catch and return data on which to evaluate the long term effects of increased commercial harvests. In contrast to other management areas in the state where intensive research studies have been conducted for many years, forecasts of actual numbers of salmon returning to the Yukon River system are not available. Effective management of the fisheries is difficult due to the character of the fishery (e.g. allocation problems within and between upriver and downriver fishermen), the complexity of multi stock, multi species salmon runs and the immense size of the Yukon River itself. For example, fisheries distributed over 1,400 river miles are harvesting mixed stocks usually several weeks and hundreds of miles from their spawning grounds. The Yukon River commercial fishery is essentially a mixed stock fishery and as a result some tributary populations may be under or overharvested in relation to their actual abundance. Based on current knowledge, it is impossible to manage stocks separately, and there is concern that small spawning populations may be reduced to very low levels.

Due to the turbid water conditions of the main river (and some of its tributaries) and the vast size of the Yukon River drainage, accurate in-season assessments of escapements immediately past the intensive downriver fishery are very difficult with the present available technology and funding. Also, in-season management of individual runs (often mixed species) and analysis of catch data are hampered by variable run timing and entry patterns into the lower river fishery. The usefulness of commercial catch data

analysis is also limited by recent changes in the commercial fishery. For example, some fishermen use small mesh gill nets (5 1/2 - 6 inch) during the chinook salmon season to harvest the larger run of summer chum salmon. This is in contrast to earlier years when 8-8 1/2 inch mesh gill nets were exclusively used. In addition, the fishery has become more efficient (e.g. increased mobility, more fishermen operating drift gill nets, improved communications, increased number of tendering vessels, improved equipment, etc.). Also the commercial fishery has changed due to regulatory restrictions (delayed season openings, reduced fishing time and maximum mesh size regulations). Greater dependence has been placed on Department test fishing projects in recent years for assessing run timing and abundance.

It has been a policy of the Alaska Department of Fish and Game to maintain current levels of commercial utilization in order to define trends in subsistence utilization and to obtain more information on the relationship between the salmon catch and escapement. Increased efficiency in commercial fishing requires that current regulations be maintained or even made more restrictive. Such action is essential to maintain the subsistence priority and to provide for spawning area escapements required to sustain yield of the resource. As a result of the above factors the management of the Yukon River salmon fisheries must take a conservative approach.

The basic regulations that govern the commercial salmon harvest in the area is emergency order (management order) authority to provide for fishing season openings or closures, fishing periods, mesh size restrictions and/or guideline harvest ranges. Commercial fishing is normally allowed for a total of from one to four days a week during the open season which depends on the district and species involved. Season guideline harvest ranges are utilized for chinook and fall chum salmon fisheries throughout the area. Fishing effort usually occurs during the entire run and not just during any particular segment of the run.

During the fishing season, if it becomes apparent that the run is substantially smaller or larger (based on analysis of comparative commercial and/or test fishing data, hydroacoustic evaluation, and preliminary

escapement data) than needed for escapement and subsistence requirements, then the commercial harvest rates can be adjusted through the use of the emergency orders. A list of emergency orders dealing with changes in fishing time and other regulations issued for the Yukon Area in 1987 is presented in Attachments 1 and 2. Also presented are 1987 regulation changes promulgated by the Board of Fisheries during its December 1988 meeting (Attachment 3).

Research and management projects have been initiated and other programs are planned, contingent on additional funding, for obtaining the biological information necessary for better management of salmon runs. During 1987, the following projects were conducted:

1. Test Fishing. Program at Middle and North Mouths (set gill nets for all salmon) in the delta area and a fishwheel site near Ruby (fall chums and cohos) to determine run timing and to provide an index of abundance for comparisons between years.

2. Side Scan Sonar. Projects to enumerate escapements in Anvik River (summer chums) and Sheenjek River (fall chums). In addition, the U.S.F.W.S. operated a project on the Chandalar River (fall chum salmon).

3. Counting Tower. Project to enumerate escapements in East Fork Andreafsky River (chinook and summer chum salmon).

4. Main River Sonar. BioSonics hydroacoustic equipment operated in the main Yukon River near Pilot Station to determine the feasibility of enumerating salmon in order to obtain in-season estimates of abundance.

5. Stock Separation Biology. Catch and escapement scale and electrophoretic samples of chinook and fall chum salmon were collected throughout the drainage for the purpose of identifying major stocks by scale analysis techniques. This project provides for allocating the catch to areas of origin.

6. Data Processing of Commercial Fishery Statistics. Lower Yukon River commercial catch and effort data analysis from fish tickets, obtained by microcomputer at the Emmonak field office, was utilized for in-season management purposes.

7. Aerial Surveys of Salmon Spawning Streams. Aerial surveys to maintain index of escapements of primary streams and to develop additional escapement index areas. Additionally, fall chum salmon foot surveys were conducted in the Tanana River drainage.

8. Tagging Project. To estimate harvest rates and total escapement to upper Yukon River (Yukon Territories, Canada) a salmon tagging project was conducted (chinook and fall chum salmon) by D.F.O. Additionally, mark and recapture programs were conducted on the Chena and Salcha Rivers to determine total escapement estimates.

The Division of Commercial Fisheries of the Alaska Department of Fish and Game is responsible for the management of commercial and subsistence fisheries in the state. The permanent staff assigned (full time) to the Yukon area includes seven positions - two area management biologists, one assistant area management biologist and three research biologists. In addition approximately 30 seasonal employees are hired each season to assist the permanent staff in conducting various management and research studies. Also, the staff aids in the enforcement of regulations in cooperation with the Division of Fish and Wildlife Protection (Department of Public Safety).

Operating funds allocated by the State of Alaska for the Yukon area salmon management and research program from July 1, 1987 through June 30, 1987 were $767,900 and an additional $250,000 was allocated from the Federal Government to address research issues associated with U.S.-Canada salmon negotiations. An additional $16,600 State funds were allocated to conduct herring studies at Cape Romanzof.

In addition to the salmon and herring management and research programs, the staff works to obtain information to determine the potential for commercial fisheries on under-utilized species such as whitefish.

A unique problem in the lower river area is the language/communication barrier. Many of the older native people cannot read or speak English. Therefore, the staff often uses translators when conducting the many public meetings that are annually held throughout the area. To assist in education and information, special field announcements are broadcast during the fishing season over radio stations KNOM and KICY in Nome and various radio stations in the Fairbanks area.

Special Studies

Attachment 4 lists special studies undertaken during 1987 and includes a summary of objectives, procedures and results for each.

AREA SALMON REPORT, 1987

Area Season Summary, 1987

In 1987, the Yukon River salmon runs were judged overall poor to above average in magnitude, based on comparable catch and escapement data.

In 1987 there were 131,971 chinook, and 442,238 summer chum salmon, totaling 574,209 salmon taken for commercial sales (Table 4). An additional 121,968 pounds of roe was commercially delivered. No commercial harvest of fall chum or coho salmon was allowed. The U.S. commercial harvest for all species combined was 43% below the previous 1982-1987 average of 1,010,106 fish and roe production was 39% below the 1982-1987 average of 200,332 pounds (1982-1987 average) (Appendix Tables 2-6). Commercial fishing period catch data by district is presented in Tables 6 through 11. Canadian commercial fishermen in the Yukon Territory harvested an additional 10,704 chinook and 40,341 fall chum salmon.

In 1987 the U.S. commercial chinook salmon catch was 3% above 1982-1986 average of 127,523 fish (Appendix Table 2). The 1987 commercial summer chum salmon catch sold in the round was approximately 27% below the 1982-1986 average of 606,669 fish (Appendix Table 3). Summer chum salmon roe sales were the lowest on record since 1979 and were below the 1982-1986 average of 198,072 pounds by 38%. The 1987 season marked the first year of no commercial harvest of fall chum or coho salmon since initiation of the fishery in 1961.

Subsistence harvests during 1987 in the Yukon Area (excluding Yukon Territory) were estimated at 53,124 chinook and 275,914 summer chum, 245,834 fall chum and 48,603 coho salmon (Table 14). Chinook salmon harvests were approximately 29% above the 1982-1986 averages (41,023 fish), while summer chum salmon harvests were 7% above the average for the same time period (257,564 fish). Fall chum (245,834 fish) and coho (34,631 fish) salmon harvests were 30% and 38% above 1982-1986 averages, respectively (Appendix Tables 28-31).

In 1987 a total of 785 Commercial Fisheries Entry Commission (CFEC) gill net permits and 161 fishwheel permits (not including transfers) were issued in the area (Appendix Table 7). Table 5 shows the residency of all persons issued CFEC permits for 1987. The actual number of commercial fishing vessels (fishermen) that made at least one salmon delivery by district during the season are shown in Appendix Table 8.

The vast majority of the salmon catch was processed primarily as a fresh/frozen product. Production of salmon roe in upper Yukon area fisheries totaled 121,968 pounds from commercial fishermen. Commercial salmon production data is presented in Appendix Table 23. All buyers and processors operating in the Yukon area during 1987 are listed in Table 3.

Yukon area commercial fishermen received $7,164,300 for their catches in 1987. The first wholesale value of the 1987 pack was estimated at $17,910,750 (Appendix Table 24).

Average prices paid to fishermen and average salmon weights are presented in Appendix Tables 25 and 26, respectively.

Commercial Fishery, 1987

Lower Yukon Area

The 1987 lower Yukon area (Districts 1, 2 and 3) commercial salmon catch totaled 166,415 fish which was comprised of 126,140 chinook and 40,275 summer chum salmon (Appendix Tables 2 - 5).

Fishing effort, in terms of the actual number of participating fishermen (gear permit holders), is presented in Appendix Table 8. In 1987 a total of 711 CFEC gill net permits were issued for the lower Yukon area (Appendix Table 7). A total of 659 permit holders fished at least once in the lower three districts during 1987.

A total of 10 processors operated in the lower Yukon Area in 1987. Six processors bought fish in more than one district. Nearly all of the commercial salmon catch was shipped to fresh or fresh- frozen markets. One processor in District 1 hard-salted 21,826 lbs. of salmon. For the third time in the history of the fishery, there was no canning of salmon in the Yukon area.

Chinook Salmon. Chinook salmon migratory timing into the lower river appeared to be average. The mean April Nome air temperature was 19°F. (2° warmer than the 1961-86 average)(Appendix Table 38). The lower river was generally free of ice by 30 May. The first chinook salmon was reported caught on 31 May in at Alakanuk by a subsistence fisherman.

The first chinook salmon caught in Department test fishing nets occurred on 2 June at south mouth, 5 June at middle mouth, and 10 June at north mouth. The characteristics of the return were similar to those of early run timing as test net catch rates increased steadily to a moderate level and remained

relatively stable during an extended period of time. The chinook salmon return was primarily through the south mouth as anticipated by northerly winds during May and extensive sea ice off middle and north mouths into June. Significant test net catches did not occur in middle or north mouths until 20 June while south mouth catches increased beginning 7 June.

The commercial fishery was opened by emergency order after approximately 9 days of increasing subsistence and test net catches in the lower river. The fishing season was opened on a staggered basis: 15 June in District 1, 17 June in District 2, and 21 June in District 3. A fishing schedule of two-24 hour periods per week was established (District 1 - Mondays and Thursdays, District 2 Sundays and Wednesdays).

Following the initial commercial fishing periods in Districts 1 and 2, the combined harvest was less than 25,000 chinook salmon. This relatively low catch indicated a significant number of fish, as documented by cumulative test net catch data, had passed through the lower two districts prior to initiation of the commercial fishery. Therefore, it was not warranted to reduce fishing time during the next fishing periods scheduled to begin 18 and 22 June in Districts 1 and 2, respectively. The first three periods in Districts 1 and 2 were allowed to occur as initially scheduled, after which the combined harvest for the two districts was approximately 83,000 chinook salmon (Tables 6 and 7). At that time, based primarily on comparative test net catch data, it was determined that the chinook salmon return was above average in magnitude and estimated that approximately half the return had passed the lower end of District 1 about 20 June. Although the midpoint of the guideline harvest range had not been reached it was warranted to reduce the next fishing periods in Districts 1 and 2 from 24 hours in duration to 12 hours. This action was taken in consideration of the guideline harvest range, the harvest to date, the anticipated harvest from scheduled fishing periods, and the anticipated incidental harvest of chinook salmon during subsequent restricted mesh size fishing periods. Following this fourth unrestricted mesh size fishing period in Districts 1 and 2 the combined chinook salmon harvest was 102,274 fish.

Restrictions were then implemented to allow for the use of gill nets of six inch maximum mesh size to direct harvest toward summer chum salmon. Three additional commercial fishing periods were allowed in both Districts 1 and 2. These fishing periods were of 6-24 hours duration and occurred between 29 June and 10 July. An additional 21,827 chinooks salmon were harvested during these periods. The harvest of chinook salmon during restricted mesh size fishing periods was twice the prior five year average (1982-1986) for the same time period.

The total District 1 and 2 chinook salmon harvest was 124,101 fish, 3% above the upper end of the guideline harvest range and 4% above the recent 5-year average (1982-1986). Primary areas of catch in District 1 included Black River, south mouth, and the Head of Passes-Ten Mile Area. Catches from middle and north mouths were generally poor. Other primary areas of catch included the upper and lower ends of District 2.

In District 3 a total of 3 unrestricted mesh size fishing periods (two-24-hour periods, one-12-hour period) and one restricted mesh size fishing period (24-hour period) was allowed 21 June - 2 July. Fishing periods were established to occur simultaneously with District 2 commercial fishing periods to provide fishermen in the lower end of District 3 the convenience of selling fish to District 2 buyers. The initial delay in opening District 3 allowed the first segment of the chinook salmon return to pass through the district prior to commercial fishing. A total of 2,039 chinook salmon was harvested from District 3, which was approximately the mid-point of the guideline harvest range, and 23% below 1982-1986 average (Table 8).

Comparative test net catch data indicated that the 1987 chinook salmon return was most similar to the 1981 return from which 145,287 fish were commercially harvested from Districts 1 and 2 and 4,023 fish were harvested from District 3. During 1981 good spawning escapements were documented throughout the Yukon River drainage. Although the 1987 return of chinook salmon was of later run timing than the 1981 return, during both years the returns were primarily through the south mouth and of longer duration than returns of other years. Approximately 50% of the 1987 chinook salmon return had entered

the lower river by 24 June. Commercial catch age composition information from Districts 1 and 2 indicated the harvest was made up of primarily 6-year-old fish (76.5) while age 5, and age 7 fish composed 7%, and 13% of the catch, respectively. The average weight of chinook salmon in the commercial catch was 21.7 lbs. per fish.

Summer Chum Salmon. Summer chum salmon migratory timing into the lower river initially appeared to be average in 1987. The first recorded summer chum salmon was caught near Alakanuk by a subsistence fisherman 4 June. The first Department test net catches of summer chum salmon in south, middle, and north mouths occurred on 6, 7, and 12 June, respectively. Significant catches of summer chum salmon did not occur until 12 June after which catches remained at moderate levels.

Through 27 June, the return appeared similar to returns of 1982 and 1983 from which approximately 432,000 and 699,000 summer chum salmon were harvested, respectively, in Districts 1 and 2 combined. During 1982 and 1983, spawning ground escapement objectives were not achieved in the Anvik River, however, they were achieved in the Andreafsky River. On termination of the 1987 unrestricted mesh size chinook salmon directed commercial season (29 June) 128,017 summer chum salmon had been harvested in Districts 1 and 2. This was the second lowest harvest of summer chum salmon in Districts 1 and 2 through this date in recent years, and 47% below the recent 5-year average (1982-1986). It was apparent by this time that summer chum salmon run timing was late, with run strength average at best.

On 4 July after two-24-hour restricted mesh size (6-inch maximum mesh size) fishing periods in District 1, and one-24-hour restricted mesh size period in District 2 the summer chum harvest was only 302,659 fish. It was apparent that the summer chum salmon return was below average in magnitude based on lower river test net catch indices, commercial harvest rates, and initial summer chum salmon spawning area assessments from the Anvik and East Fork Andreafsky Rivers. Therefore, it was warranted to reduce commercial fishing time in order to provide increased likelihood of achieving spawning area escapement objectives. Action taken included elimination of one fishing

period and reduction of scheduled fishing time in District 1 and reduction of scheduled fishing time in District 2. The commercial fishing season was then closed effective 10 July in District 1, and 9 July in District 2. Reduced fishing time provided for increased summer chum salmon spawning escapements. The District 1 and 2 summer chum salmon harvest was 397,774 fish, 28% below the recent 5-year average (1982-1986), and the lowest since 1977. Commercial summer chum salmon catch and effort data are presented in Appendix Tables 3 and 19.

The District 3 commercial fishery allowed for a single 24-hour restricted mesh size period in addition to those periods implemented during the unrestricted mesh size season. The commercial fishing season closed 2 July, not as a conservation action, but similar to prior years with achievement of a chinook salmon harvest within the guideline harvest range. Additionally, an opportunity was provided to commercial fishermen to gain a harvest of summer chum salmon prior to deterioration of summer chum salmon flesh quality. The closure additionally provided subsistence fishermen an increased opportunity to harvest salmon. The District 3 summer chum salmon harvest was 3,501 fish, 20% below the recent 5-year average (1982-1986), however, it was the largest harvest since 1983.

Comparative test net indices indicated the 1987 summer chum salmon return was most similar to the 1982 return. During 1982, spawning area escapement objectives were achieved in the East Fork Andreafsky and the Salcha Rivers. Escapement into the Anvik River was 9% below the objective and the Chena River escapement was about average. During 1987, approximately 50% of the 1987 summer chum salmon return had entered the lower river by 22 June, slightly later than recent years with the exception of 1985. Preliminary age composition information from Districts 1 and 2 indicated the commercial catch was composed of 54% age 4, 38% age 5, and 8% age 6 summer chum salmon. The average weight of summer chum salmon in the commercial catch was 6.8 pounds per fish.

Fall Chum Salmon. The commercial fishing season was closed 10 July in the lower Yukon area due to conservation measures taken during the summer chum

salmon directed commercial fishery. The first fall chum salmon captured by Department test nets, based on morphological characteristics, occurred at middle mouth on 7 July. Summer chum salmon catches predominated in test nets through 15 July (90%). Fall chum salmon catches increased to 70% of the total chum salmon catch 16-26 July, after which few summer chum salmon were present in test net catches.

Based on test gill net and subsistence catch rates, fall chum salmon abundance remained low during the last two weeks of July indicating late run timing and suggesting a poor return. The first major pulse of fall chum salmon entered the river from 30 July to 1 August. By this time it was becoming apparent, based on test net catch rates and sonar enumeration of fish passage, that the fall chum salmon return was below average in magnitude as indicated by the pre-season projection.

Evaluation of prior year test net catch data indicated that during recent years 40-60% of the fall chum salmon return had entered the lower river by 3 August. An in-season total return projection was made on 4 August indicting the 1987 return was most similar to returns during which escapement objectives were not met. Although the 3 August test net catch was relatively good, catches dropped off 4 August and remained at low levels through 7 August. It was determined on 7 August, based on a projection of the Main River Sonar fish passage estimate, that the total Yukon River fall chum salmon return would be between 444,000 - 667,000 fish. A total fall chum salmon return toward the lower end of the projection was considered to be the best estimate based on relative run timing information and the pre-season projection. A return of this magnitude would provide for achievement of spawning area escapement objectives and subsistence harvest levels similar to recent year averages. Therefore, the decision was made and announced on 7 August that no further commercial salmon fishing would be allowed in the lower Yukon Area during the 1987 season.

Historic commercial fall chum salmon catch and effort data are presented in Appendix Tables 4 and 20.

Lower Yukon River test fishing projects were terminated on 28 August. The fall chum salmon cumulative season test fish catch index was similar to those of 1984 and 1985. Prior to 1987, commercial fishing harvests reduced daily test fishing catches by an unknown amount. This suggests the 1987 test fishing index may indicate a somewhat larger run than the actual size in comparison with prior years.

Coho Salmon. Department test net catches indicated a steady increase in coho salmon abundance between 8 and 18 August. No commercial fishing was allowed since fall chum salmon run strength was determined to be at a level which would not allow for an incidental harvest. The latter portion of the fall chum salmon run, which would be impacted by a fishery during late August, has been identified to be primarily bound for the Tanana River. To provide for adequate escapement of fall chum salmon to all major spawning areas, it was determined that commercial exploitation of late run salmon was not warranted.

Coho salmon test fishing data indicated that the run was late. On termination of the test fishing projects, there was no indication of diminishing run strength. Since the coho salmon run continues into September, the Department is evaluating program priorities to determine the feasibility of funding a program to monitor the return of this species through the middle of September.

Historic commercial coho salmon catch and effort data are shown in Appendix Tables 5 and 20.

Upper Yukon Area

During the 1987 season the combined upper Yukon commercial salmon harvest totaled 5,831 chinook, and 40,693 summer chum salmon. An additional 121,968 pounds of roe was commercially delivered. No commercial fishery occurred for fall chum or coho salmon. Salmon production data is expressed as number of fish sold in the round and pounds of unprocessed roe which were sold. On average, female chum salmon from the middle and upriver districts produce approximately one pound of roe per individual. Table 6 presents total

estimated commercial related salmon catch by district during 1987. These catch figures reflect the incidental catch of male summer chum salmon taken incidental to the roe directed fishery in the upper Yukon area which were not sold.

Upper Yukon commercial fishermen received an estimated (per round weight pound) average of $0.79 for chinook salmon, $0.19 for summer chum salmon, and $2.22 for salmon roe (Appendix Table 25). The approximate (ex-vessel) value of the 1987 harvest was $419,000 which includes an estimated $270,800 (65%) paid to fishermen for salmon roe sales. During the course of the season, 141 upper Yukon fishermen participated in the commercial fishery, (making at least one delivery) and average per-fisherman earnings were approximately $3,000.

A total of 17 buyer/processors and 6 catcher-sellers reported deliveries during 1987.

Chinook Salmon. As judged by cumulative commercial harvests and by reported subsistence catches in Districts 4 and 5, the 1987 chinook salmon run appeared to have been strong.

The commercial harvest in District 4 of 1,542 chinook salmon was the largest reported harvest since 1979. Although the commercial catch in District 5 of 3,105 chinook salmon was 17% below the 1982-1986 average, the run in that portion of the drainage was judged to have been stronger than in recent years. Reports from subsistence fishermen received after the close of the commercial season (on 11 July) suggested large numbers of chinook salmon present in the lower portion of that district throughout the month of July and into early August.

In the Tanana River (District 6) the commercial fishing season was closed on 21 July; at that time the commercial catch of chinook salmon was reported to be slightly in excess of 800 fish. The commercial guideline harvest range established by the Board of Fisheries for this district is 600-800 chinook salmon. Late catch reports and incidental catches of chinook salmon made

when the chum salmon fishery was re-opened brought the season total to 1,202 chinook salmon. Although in-season assessment of run strength in the lower Yukon area had indicated a run of above-average magnitude, escapement data from major Tanana River tributaries were not yet available to confirm that judgement.

Aerial surveys conducted on the Salcha River on 24 and 27 July indicated unexpectedly low numbers of spawning chinook salmon. Catch data from ADF&G gill nets in the lower Salcha River suggest a poor return of both chinook and chum salmon; in addition, creel census data from the lower Salcha River sport fishery indicated the 1987 chinook salmon run to be the poorest return in recent years. Available catch data from the sport fishery during late July suggested that the harvest to date was approximately 130 chinook and that the normal take was 700-900 fish. Because these indicators suggested unacceptably low escapements to this important spawning stream, a closure of the subsistence salmon fishery on the Tanana River between the mouth of the Chena and the mouth of the Salcha Rivers was imposed on July 31. The closure was rescinded on 7 August at which time the chinook salmon run was judged to be essentially over.

Summer Chum Salmon. The 1987 harvest of summer chum salmon taken during open commercial fishing periods in the upper Yukon area was estimated at 221,266 fish (Table 13). Fishery sales receipts (fish tickets) accounted for the sale of 40,963 fish in the round and 121,968 pounds of roe. These harvests of fish in the round and pounds roe sold were 17% and 38% below the recent 1982- 1986 averages, respectively (Appendix Table 6).

Since 1980, buyers and processors operating in District 4 have had very limited markets for summer run chum salmon; as a result, salmon roe has become the primary fisheries product exported from the area. During 1987, an approximate total of 121,474 pounds of summer chum salmon roe was produced in District 4, roughly 91% of which originated in Subdistrict 4-A. A total of 29,991 summer chums (in the round) was sold in this district, the greatest number since 1981. In response to below average summer chum salmon run strength, commercial fishing restrictions were implemented in District 4.

Fishing time was reduced from two-48-hour periods per week to a single 48-hour period per week beginning 7 July and continuing through the season.

A total of 87 commercial fishermen made landings in District 4 during the 1987 summer season which is in excess of the 1982-1986 average (71) (Table 9 and Appendix Table 8).

In District 5, summer chum salmon are sold only incidentally to the directed chinook salmon harvest; a total of 362 summer chum salmon in the round and 44 pounds roe were was commercially harvested during the 1987 season.

The District 6 summer chum salmon harvest was composed of 10,610 fish in the round and 450 pounds roe (Table 11). The harvest of summer chum salmon in the round was 25% above the 1982-1986 average. The roe harvest was 60% below the 1982-1986 average. The carcasses of female and the males taken incidental to the roe directed fishery are thought to be fully utilized to meet subsistence needs. This fishery is located on the road system and buyers in this area do not have the high freight costs associated with shipping fish from more remote locations such as Galena or Grayling. Primarily for this reason, a higher percentage of Tanana River summer chum salmon are marketed in the round than in District 4.

The first deliveries of summer chum salmon in District 6 occurred 6-8 July. Due to achievement of the chinook salmon harvest guideline, the season closed 21 July. Approximately 60% of the summer chum salmon harvest was taken during the second season. In response to below average summer chum salmon run strength, the commercial fishing closure in District 6 following achievement of the chinook salmon commercial harvest guideline was extended in duration from recent years to afford additional protection to summer chum salmon.

Fall Chum and Coho Salmon. During the 1987 season no commercial fall chum or coho salmon commercial fishery occurred in the upper Yukon area. Ruby (river mile 594) north bank test fishwheel catch data supported and reinforced the assessment of fall chum salmon run size obtained from the lower river.

However, subsistence catch reports from District 5 fishermen indicated the run was of greater strength than determined by Department programs. Given the Department's demonstrated tendency to overestimate run strength and the overriding need to satisfy spawning ground escapement requirements, a decision was made to allow no commercial harvest in District 4 and 6.

Subsistence Fishery, 1987

Subsistence salmon catch data have been collected through the use of personal interviews and/or catch calendars (on which fishermen record daily catches) since 1961. Additionally, in recent years subsistence fishing permit catch information has been available for three sections of the upper Yukon area. Due to funding limitations the Department was unable to send survey crews to all villages in 1983 and 1984 to interview fishermen, however, in 1985 personal interviews were conducted in most villages. During 1986 and 1987, in response to funding provided for US/Canada negotiation support, the most comprehensive subsistence fishery harvest surveys on record took place. In the lower Yukon Area during 1987, interviews with fishermen were conducted in all villages (11), while in the upper Yukon Area interviews were conducted in the majority of communities along the mainstem Yukon River (16) and communities along significant tributaries of the Yukon River (9). During 1987 subsistence surveys were additionally conducted of coastal communities (Scammon Bay and Hooper Bay) which harvest salmon bound primarily for the Yukon River. During both 1986 and 1987, subsistence harvest information was collected by the Department of Fisheries and Oceans (DFO)in Canada.

During 1987 a regulation was in effect that prohibited non-rural residents from participation in subsistence fall chum salmon harvests. Non-rural residents harvested fall chum salmon under personal-use fishing regulations. Personal-use harvests are included with the subsistence harvests (Appendix Table 14).

While conducting personal interviews the subsistence survey participation list was updated and participants not home during the interviews were mailed questionnaires. The catch by fishermen, who were known to have fished for

subsistence purposes but who were not interviewed and did not return the questionnaire, was derived by averaging the total known catch (by species) for that village and assigning those values to households not contacted. Information regarding numbers of dogs and type and amount of fishing gear was determined in a similar manner.

Potential problems with expansion of data in the manner described above should be explained. In some cases, a single fisherman may take several thousand chums for the purpose of feeding large numbers of sled dogs. When data for a village which include atypical catches like these, the final expanded value may exceed what could reasonably be expected to have been caught. Conversely, expanded data which does not include a fisherman who made extremely large catches, may understate the actual harvest for that village.

Table 14 presents 1987 catch estimates by village and Appendix Tables 27-32 show long-term comparative catch data.

The estimated total chinook salmon subsistence harvest for the entire Yukon River drainage of 59,450 fish is the highest on record (Appendix Table 28). The estimated (combined) chum and coho salmon harvest of 574,253 fish was the second largest recorded since 1940 and is 22% above the recent 5-year average and 34% above the recent ten-year average.

Lower Yukon Area

During 1987, an estimated 21,805 chinook, 68,055 summer chum; 34,774 fall chum and 13,972 coho salmon were harvested by fishermen representing 534 households for subsistence purposed in the lower Yukon Area (Table 14). Catches of chinook and summer chum salmon were 55% and 15% above the recent 5-year averages, respectively. Catches of fall chum salmon catches were 49% above the recent 5-year average while coho catches were similar to the 5-year average. Historical subsistence catch and effort data indicate a trend of increasing subsistence catches. Fall chum and coho salmon catches were

probably slightly higher than reported because some fishing occurred after the interviews were completed.

In all villages, most of the chinook and summer chum salmon were caught prior to the opening of commercial fishing. A significant portion of the summer chum harvest was taken during open commercial fishing periods. Fall chum salmon were caught during the entire migration of the run.

Upper Yukon Area

The 1987 upper Yukon area (excluding Canada) subsistence salmon catch was estimated to be 404,869 fish. Of these were an estimated 31,319 chinook, 207,859 summer chum, 211,060 fall chum, and 34,631 coho salmon. Catches of chinook, summer chum, fall chum, and coho salmon were 16%, 5%, 40% and 60% above the recent 5-year average, respectively.

The possibility of overestimating the summer chum salmon subsistence harvest in District 4 has been discussed in previous annual management reports. As was discussed in a previous section of this report, commercial fishermen in District 4 have only a very limited market for summer chum salmon. As a result, fishermen extract and sell roe from their catch and retain the carcasses for subsistence use. During the 1980-1985 period, it is likely that many fishermen have reported this portion of their commercial harvest as subsistence fish. In fact, it is probable that the unmarketable commercial product have simply replaced a large portion of the subsistence harvest in this area. During 1985, Division of Subsistence personnel conducted the subsistence catch surveys in Kaltag and Nulato. Questions regarding summer chum harvest were posed in such a way as to eliminate reporting of "surplus" commercially caught fish as subsistence. For this reason, summer chum catches from these villages during 1985 was much lower than in previous years or the current year. The 1986 and 1987 subsistence surveys and personal interviews were conducted in such a manner to estimate the number of summer chum salmon taken by commercial related activities and those taken by standard subsistence fishing means. An estimated total of 157,406 summer chum salmon were taken for subsistence utilization within the District 4

watershed during 1987, with 84% being taken in association with commercial fishing related activities.

Subsistence fishing permits are required in three areas within the upper Yukon drainage: (1) the Tanana River drainage upstream of the Wood River confluence; (2) the Yukon River between Hess Creek and Dall River; and (3) the Yukon River between the upstream mouth of Twenty-two Mile Slough and the U.S./Canada border (Table 14 and Appendix Table 32).

Escapement, 1987

Comprehensive salmon escapement enumeration studies were conducted in 1987 on the East Fork Andreafsky, Anvik, Chena, Salcha, Chandalar, Sheenjek, and Delta Rivers in the Alaskan portion of the drainage and on the Fishing Branch River, Big Salmon River, and at the Whitehorse fishway in Yukon Territory, Canada. Studies at each of these locations were designed to enumerate or estimate more completely the total population of spawners by a variety of methods.

A counting tower was operated on the East Fork Andreafsky River while hydroacoustic techniques were employed to monitor escapements to the Anvik, Sheenjek, and Chandalar Rivers. Mark-and-recapture methods were used to generate a population estimate for chinook salmon spawners in both the Chena and Salcha Rivers, with the Sport Fish Division conducting the Salcha River study. A fall chum salmon population estimate for the Delta River was made using replicate ground survey observations and salmon stream life data. The Canadian Department of Fisheries and Oceans (DFO) operated a weir on the Fishing Branch and Big Salmon Rivers while an enumeration window and passage gate was operated at the Whitehorse fishway.

In addition to the studies mentioned above, the Department attempted to enumerate salmon abundance by species in the mainstem Yukon River near Pilot Station (river mile 122) by hydroacoustic methods. Similarly, DFO generated population estimates for both chinook and fall chum salmon entering Yukon Territory using mark-and-recapture techniques. Remaining escapement

information throughout the Yukon River drainage was obtained primarily by aerial surveillance and occasional ground surveys.

Survey conditions in 1987 varied dramatically throughout the Yukon River drainage during the survey periods of mid July through August and late September through early November. The most favorable conditions for aerial assessment of primary index streams for chinook and summer chum salmon prevailed in the lower river, downstream of Galena. Heavy rains in late July created turbidity problems in many index streams in the upper Koyukuk and Tanana River drainages. The worst survey conditions were encountered in mid-August in Yukon Territory where only four or five days during the peak of chinook salmon spawning provided good survey conditions. Lack of survey aircraft together with inclement weather often hindered aerial assessment of fall chum and coho salmon escapements.

Escapement estimates obtained in 1987 are shown in Table 16 while Figures 2 through 6 show major Yukon River tributary systems.

Chinook Salmon. Appendix Table 33 presents historic chinook salmon escapement data for selected streams during the period 1972-1987. Minimum and optimum chinook salmon escapement goals have been established for eight streams in the Alaskan portion of the drainage: East (1,100-1,600) and West Fork (700-1,000) Andreafsky, Anvik (300-500), North (500) and South Fork (500) Nulato, Gisasa (650), Chena (1,000-1,700), and Salcha (1,500-3,500) Rivers (Table 17). These escapement goals are based upon aerial survey counts which do not represent total escapement, but do reflect annual spawner abundance trends when using standard survey methods under acceptable survey conditions. The high end of the escapement goal was achieved in each of the three lower rivers (East and West Fork Andreafsky and Anvik Rivers) as well as being met in the Nulato and Gisasa Rivers. Chinook salmon escapements in the Chena and Salcha rivers fell more near the mid-range goal for each of these streams. The mark-and-recapture population estimates for chinook salmon spawners in the Chena and Salcha rivers were 6,404 and 4,771 fish, respectively.

In Yukon Territory, chinook salmon escapements were extremely poor to the Teslin River drainage as well as through the Whitehorse Fishway. Survey counts in the two index areas of the mainstem Nisutlin River and that of Wolf River were the lowest observed in the past eight years. Comparatively, escapements to the Big and Little Salmon Rivers appeared much better. Unfortunately, the Ross River was high and turbid, but based upon limited observations made there and in the Hoole River, chinook salmon escapements to the Pelly River drainage may also have been comparatively better than those upstream of the Big Salmon River.

A population estimate of chinook salmon entering the Canadian portion of the drainage made by DFO was 30,823 fish in 1987. Subtracting the Canadian commercial, domestic and subsistence harvest (17,330 fish) from this population estimate results in a total escapement estimate to Yukon Territory (excluding the Porcupine River drainage) of approximately 13,493 chinook salmon.

Summer Chum Salmon. Appendix Table 34 presents historic summer chum salmon escapement data for selected streams during the period 1974-1987. Minimum and maximum escapement goals have been established for six major summer chum salmon spawning streams in the lower Yukon River drainage: East (76,000-109,000) and West Fork (62,000-116,000) Andreafsky, Anvik (209,000-356,000), and North Fork (37,000-53,000) Nulato Rivers. In addition to the minimum and maximum aerial escapement objectives identified for the Anvik River, an optimum level has been set for estimated total escapement to that stream (487,000 fish). Escapement goals are 5,000-8,000 summer chum salmon for Clear Creek and 5,000-9,000 for Caribou Creek (Hogatza River drainage). Although aerial counts of summer chum salmon in the latter two streams in 1987 were below established goals, it is not known with certainty if the goals were not actually achieved as surveys were flown well after the peak spawning period.

Summer chum salmon escapements to the Andreafsky and Nulato rivers in 1987 were well below the minimum escapement goals established for each of these streams. In the Anvik River, the escapement goal was not achieved based upon

aerial surveys. However, the peak survey count was made under less than favorable survey conditions. Based upon the sonar-estimated escapement of summer chum salmon to this stream, the optimum level of spawners was achieved in 1987.

Summer chum salmon escapement to the Tanana River drainage was apparently average based upon escapement observations made in the Salcha River; the only stream in this drainage where an aerial suvey escapement objective has been established (3,500 fish). A total of 3,657 chum salmon were observed on a peak survey of this stream on 10 August.

Fall Chum Salmon. Appendix Tables 35 and 36 present historic fall chum salmon escapement data for selected streams since the early 1970's. Escapement objectives have been established for three major fall chum salmon spawning streams in the Alaskan portion of the drainage: Sheenjek (62,000), Toklat (33,000), and Delta (11,000) rivers. These are total abundance escapement goals for each of these streams based upon expansion of in-season point estimates. No commercial harvest of fall chum salmon was permitted in the Alaskan portion of the Yukon River drainage in 1987 due to the in-season assessment of weak run strength. As a result, fall chum salmon escapements were generally good, particularly in the Sheenjek and Delta rivers. The sonar-estimated escapement of 140,086 chum salmon in the Sheenjek River exceeded the escapement goal by more than 78,000. The total escapement estimate for the Delta River (21,180) was nearly double the goal for that stream. Only in the Toklat River did the estimated number of spawners (22,141) fall below the escapement goal.

An interim fall chum salmon escapement objective range was established for the Fishing Branch River in October 1987 by the Joint Canada/United States Yukon River Technical Committee. The lower end of the range was 50,000 and the upper end 120,000 fish. The 1987 weir count on the Fishing Branch River (48,956) fell just short of the lower end of the escapement objective range.

Comprehensive escapement enumeration of fall chum salmon on the Chandalar River was undertaken for the second year in 1987 by the USFWS. The sonar-

estimated escapement was 52,416 fish; very similar to the 1986 escapement estimate of 59,313 fish.

A population estimate of fall chum salmon entering the Canadian portion of the mainstem Yukon River made by DFO was 125,121 fish in 1987, being approximately 25,000 more than estimated in either 1986 or 1985. A record Canadian commercial harvest of 40,341 fall chum salmon was experienced in 1987. This harvest, together with the domestic and Indian Food fisheries, resulted in a total escapement estimate of 80,876 fall chum salmon. The aerial estimate of spawners in the Kluane River was 12,000 while 6,115 were estimated in the mainstem Yukon River spawning areas from Fort Selkirk to Tatchun Creek.

Coho Salmon. Escapements of coho salmon to index areas examined in the Tanana River in 1987 were among the highest ever observed (Appendix Table 37).

Enforcement, 1987

Lower Yukon Area

During the fishing season Fish and Wildlife Protection officers made several boat patrols and periodic float plane patrols in the lower Yukon area. More effective enforcement is needed in view of reported violations (e.g. fishing without permits, fishing large mesh gill nets after 6 inch maximum mesh size regulation become effective, and fishing closed water areas). It is recommended that two man FWP crews be stationed at St. Marys and Emmonak to conduct regular boat patrols throughout the fishing season and to provide wider coverage.

Upper Yukon Area

In portions of the upper Yukon districts, compliance with commercial and subsistence fishing regulations was good. Violations of regulations dealing with the sale of subsistence- caught salmon and roe from those salmon,

however, occur with regularity in certain areas. In addition, wastage of commercially caught salmon in those areas where markets exist only for salmon roe, may be more common than was initially thought. Enforcement of these regulations is difficult and has been largely ineffective during most years.

During 1987 Fish and Wildlife Protection identified and is investigating the possible illegal harvest of significant numbers of fall chum and coho salmon from Districts 5 and 6. The majority of the fishermen under investigation are commercial fishermen that also fished for subsistence salmon and continued to fish during commercial closures. Additional information associated with these allegations of illegal activity will be made when the cases have been dealt with by the court system.

OUTLOOK FOR 1988

Chinook Salmon

The majority of chinook salmon returning to the Yukon River are 6-year-old fish; however 5- and 7-year-old fish make a significant contribution to the run. The 1982 brood year (6-year-olds in 1988) was average to below average in abundance as judged by comparative escapement information. Survival and production by the 1982 brood year is apparently below average based on findings of lower than average contribution of 5-year-old fish to the 1987 return. It is expected that the 1988 return of 5-year-olds (1983 brood year) will be near average based on 1983 run strength and escapements. The return of 7-year-old fish (1981 year class) is expected to be above average as the return of this year class in 1986 as 5-year-olds and 1987 as 6-year-olds was above average. Overall, the 1988 chinook salmon run is anticipated to be below average in strength, similar in abundance and age structure to the 1986 return. The commercial harvest in Alaska is expected to total 70,000 to 100,000 fish.

Summer Chum Salmon

Yukon River summer chum salmon return primarily as 4-year-old fish, although substantial 5-year-old returns often result from good brood survival years. The return of 4-year-old fish in 1988 will be dependent on production from the 1984 brood year and survival of the resulting cohort. Based on available catch and limited escapement data, the magnitude of the 1984 summer chum run was judged to be above average in abundance. The return of 5-year-olds in 1988 is expected to be below average in strength based on the poor return of 4-year-old fish in 1987. In summary, based on evaluation of brood year run size data and assuming average survival, it is expected that the Yukon River summer chum salmon return in 1988 will be average to above average in magnitude. The commercial harvest is expected to be similar to the recent 5-year average (600,000 fish and 190,000 pound of roe).

Fall Chum Salmon

Similar to the summer run, fall chum salmon return primarily as 4-year-old fish. Escapements in 1984 (which will produce 4-year-olds in 1988) were below average. The return of 5-year-olds (1983 brood year) is expected to be average to below average based on the number of 4-year-olds in 1987. In summary, based on evaluation of brood year escapements and assuming average survival, a below-average return of fall chum salmon is expected in 1988. A projection of the fall chum salmon return based on an estimate of total parent-year escapements, the average maturity schedule, and expected returns per spawner indicates that a limited commercial fishery may be allowed during 1988. Commercial harvest is expected to range from between 0-80,000 fish.

Coho Salmon

Coho salmon return primarily as 4-year-old fish. Comprehensive escapement information for coho salmon is lacking, but escapement surveys in the Tanana River systems indicated above-average run strength in 1984. The proportion of 3-year-old fish in 1987 test-fish catch samples further suggests the 1988

return of coho salmon will be above average in magnitude. The commercial harvest in Alaska will be dependent on the timing and frequency of fishing periods allowed for fall chum salmon, but is expected to be 0-50,000 fish.

CAPE ROMANZOF DISTRICT HERRING FISHERY

Commercial Fishery, 1987

Commercial Pacific herring fishing periods were established by emergency during 23-27 May 1987 for a total fishing time of 8 hours (Table 40). The second largest harvest of 1,342 short tons (st) was made during the shortest ever fishing season by 157 fishermen. The entire harvest was taken from Kokechik Bay (Figure 21).

Over 98% of the harvest was taken as sac roe. Average roe recovery was 8.9%. Wastage of Pacific herring was not a problem although some gill nets were abandoned at the close of the season.

Estimated value of the total harvest to fishermen was $1.0 million. Average price for sac roe Pacific herring was $824 per st at 10% roe recovery - $55 a percentage point. Average price for bait quality Pacific herring (less than 7% roe recovery) was $125 per short ton. Several companies classified bait quality Pacific herring as being less than 6% sac roe recovery, however, no bait sales were made under this classification. Nine processors purchased herring in the Cape Romanzof District, four more than during 1985 (Table 3). Fishing effort was at an all time record with Alaska resident fishermen accounting for 87% of the effort and 70% of the harvest. Local fishermen (residents of Chevak, Hooper Bay. and Scammon Bay) accounted for 53% of the effort and 33% of the harvest.

The overall exploitation rate of Pacific herring was estimated to be 18.6% of the available biomass. Age composition information indicated age 8 and older Pacific herring comprised approximately 76% of the total harvest. Age 4 and 5 Pacific herring were not observed in the catch.

Fishing effort and processor/tender support was 62% and 80% greater than that of 1986, respectively. This provided increased fleet efficiency which resulted in a significant decrease in commercial fishing time from prior years. Catch efficiency was significantly increased by non-local fishing vessels using power rollers and shakers. Fishing periods 75-85% shorter in duration than during previous years resulted in gill nets being left in the water on period closures, primarily after the first two periods.

Four Fish and Wildlife Protection officers were present on the Cape Romanzof District fishing grounds during the 1987 Pacific herring commercial fishing season. These officers were supported by the protection vessel TROOPER, two skiffs and a Super Cub fixed wing aircraft. In total, 74 commercial fishing citations were issued. The citations were issued for fishing during closed periods (57), violations of superexclusive use regulations (9), failure to have crewmember licenses (3), failure to display vessel numbers (4), and failure to submit fish tickets prior to departing district (1). Other than briefly during 1981, this was the first season FWP participated in the Cape Romanzof District commercial fishery.

Subsistence Fishery, 1987

In 1987, a subsistence harvest of 3.1 st was reported taken by 34 fishing families from Hooper Bay, Chevak, and Scammon Bay (Table 4). The subsistence harvest survey was conducted through the mail by catch questionnaire. Approximately 20% of the questionnaires were returned. The catch figure represents only a minimum estimate since not all families were mailed questionnaires and not all families which received questionnaires returned them.

Herring Abundance

Aerial surveys were flown during the 1987 season on 19 and 24 May. During both surveys turbid water prevailed within Kokechik Bay hindering survey effort, however, on 24 May weather conditions allowed for a fair survey of Kokechik Bay adjacent to Cape Romanzof, and Scammon Bay.

Test fishing was conducted during 15 May - 3 June. A total of 868 Pacific herring was sampled from these catches. Pacific herring comprised approximately 96% of the total catch of schooling species. The commercial harvest was sampled 29-31 May. A total of 410 Pacific herring was sampled from this harvest.

The in-season Pacific herring spawning biomass, based on the 24 May aerial survey was 6,100 st. Analysis of data from aerial surveys, spawn deposition surveys, test fishing and commercial harvests resulted in a post-season Pacific herring biomass estimate of 7,200 st. Approximately 635 of the total biomass was composed of age 8 and older Pacific herring. Age 5 Pacific herring accounted for 7%, age 6 accounted for 12%, and age 7 accounted for 18% of the biomass. Newly recruited age 4 Pacific herring represented less than 1% of the total observed spawning biomass.

Ground surveys indicated primary spawn deposition occurred from 20 May - 4 June, of longer duration than most previous years. No single day's spawn was of exceptional magnitude, however deposition occurred on each tide and was well distributed throughout the district. Due to the extended duration of spawning, it was difficult to evaluate overall spawn intensity due to desiccation, erosion, and predation of eggs. On 26 May 4 inches of snow covered Pacific herring spawning areas causing high egg mortality.

Regulations

New regulations regarding the Cape Romanzof herring fishery were adopted by the Alaska Board of Fisheries during their December 1987 meeting. A regulation now provides the Department the authority to restrict gear to 50 fathoms during period established by emergency order. Additionally, these regulations prohibit gear other than the legal limit to be on board fishing vessels during open commercial fishing periods, other than unhung gear sufficient for mending purposes. A regulation was also adopted which prohibits mechanical shakers; no vessel used to take herring may have on

board any mechanical device designed to shake or dislodge herring from a gill net.

Outlook

Emergency order authority will be used to adjust the occurrence and length of fishing periods. It is very likely that gear will be restricted to 50 fathoms per vessel. A minimum level of biomass cannot be used to determine the timing and duration of commercial fishing periods since turbid water conditions usually preclude aerial biomass assessments. Therefore, test and commercial catch rates and spawn deposition observations will be used to determine timing and duration of commercial fishing periods. Average harvest for the period 1980-1987 was 1,061 st. Projected return for 1988, based upon the 1987 biomass estimate is 4,400 st which at a 20% exploitation rate would result in a 880 st harvest.

COMMERCIAL FRESHWATER FISHERIES

Regulations adopted by the Board of Fisheries allow the Department of Fish and Game to issue permits for the commercial harvest of miscellaneous species of fish such as whitefish, sheefish, char, trout pike, blackfish and lamprey. Permit authorization is not required for the sale of these species when taken incidentally in conjunction with commercial salmon fishing.

Commercial fisheries for species other than salmon have been allowed in widely scattered locations throughout the Yukon and Tanana River drainages and in the Colville River on the North Slope; most of these fisheries are limited, experimental-type operations and occur only sporadically.

A commercial fishery for whitefish has existed in the Colville River delta (located approximately 60 miles west of Prudhoe Bay) since 1964. Fishing generally takes place during late June and July for broad and humpback whitefish, and October through early December for arctic and least cisco.

Set gill nets (of 3-and 5- inch stretch measure) are used as capture gear, and fishing during fall months occurs under the ice (Appendix Table 42).

In the upper Yukon area set net fisheries targeting on whitefish have been permitted in recent years in Lake Minchumina and Healy Lake. Catch data are presented in Appendix Table 43.

Numerous other permits allowing limited harvests of whitefish, primarily for the upper Yukon area, have been issued; for reasons unknown, these fisheries did not occur.

Permits for the taking of non-salmon species have been issued for various locations in the lower Yukon area. Reported harvests for those fisheries are presented in Appendix Table 44. Set gill nets are primarily used for taking whitefish and sheefish and the catch is marketed in local village stores or Bethel.

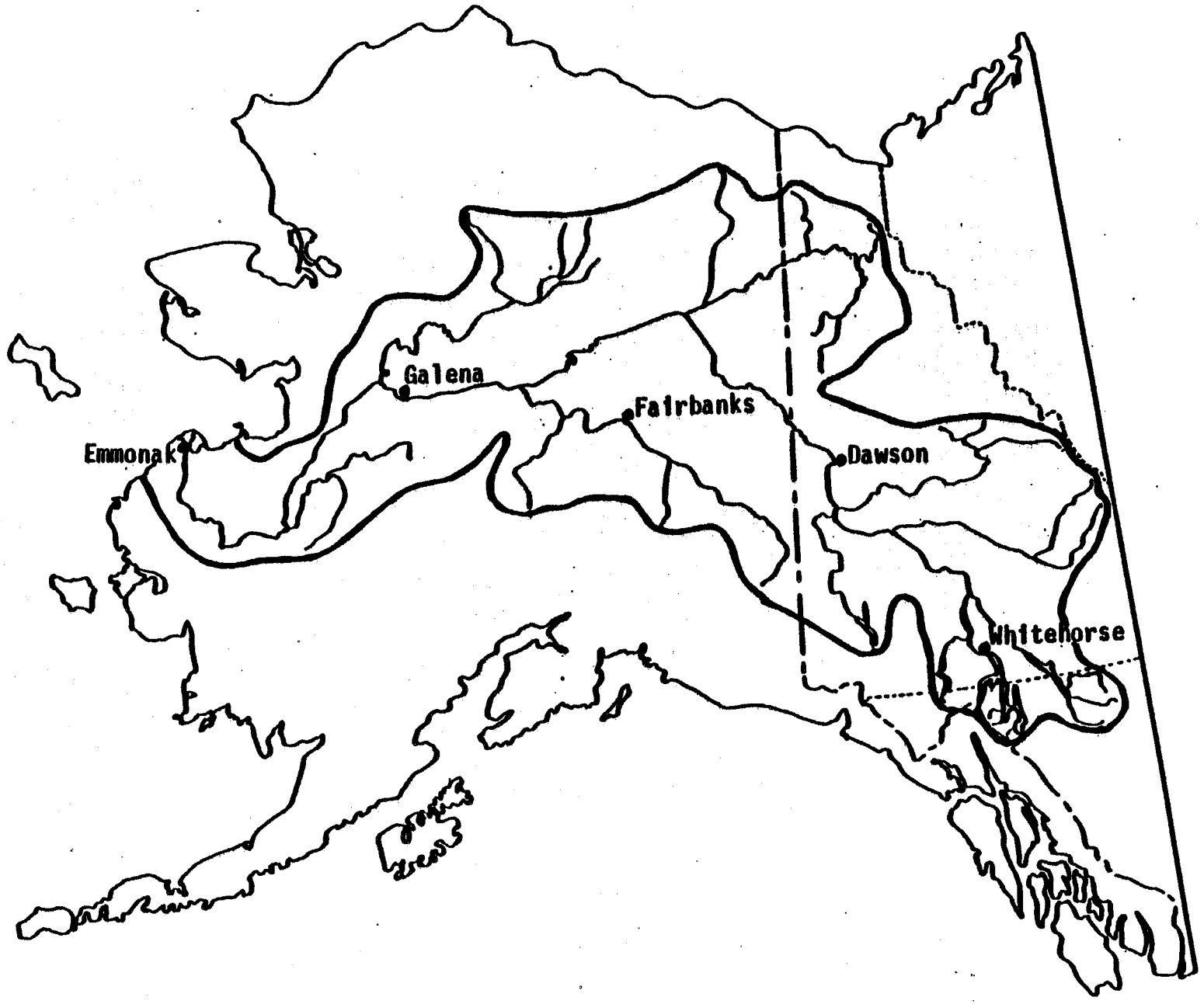


Figure 1. The Yukon River drainage, 330,000 square miles.

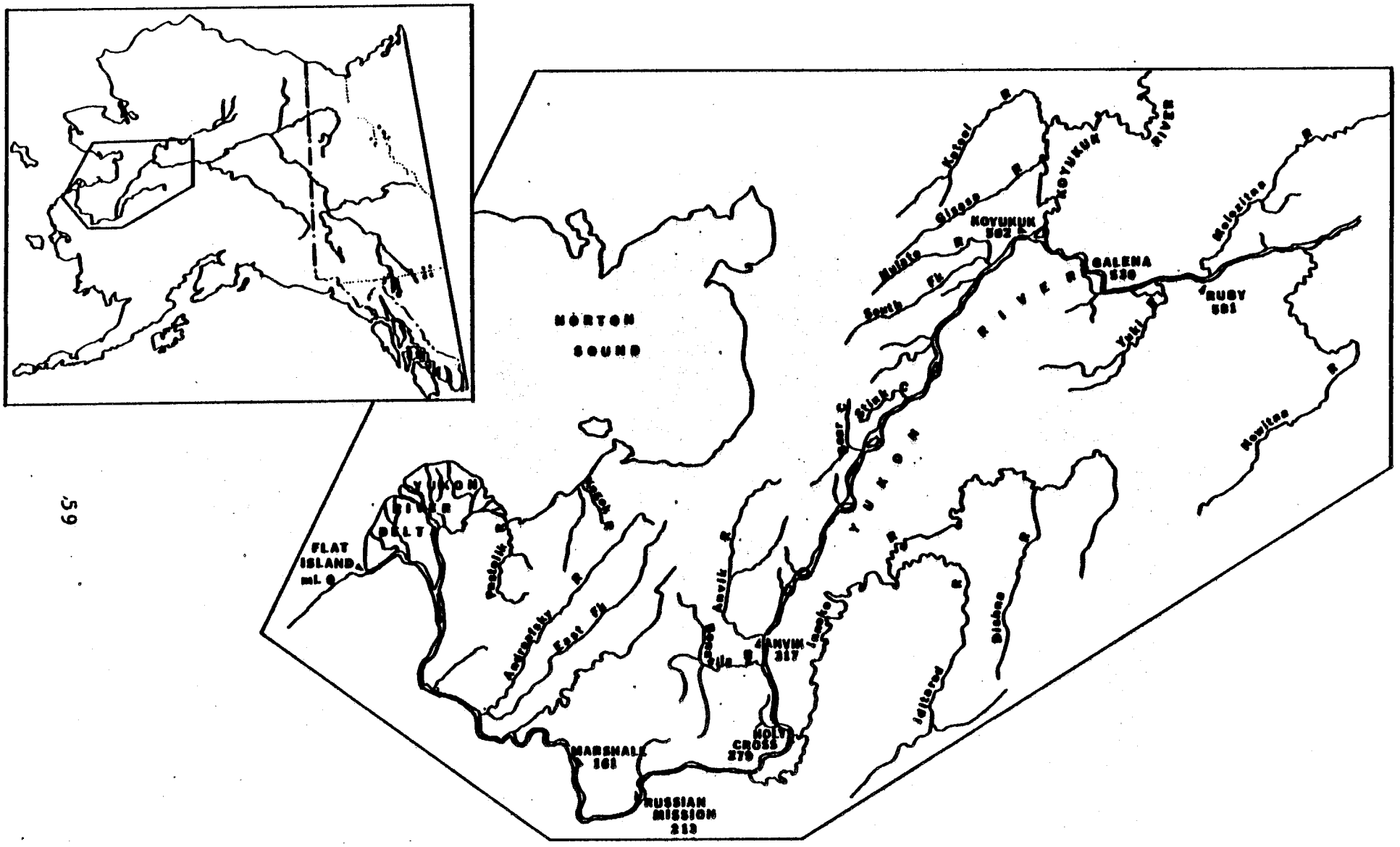


Figure 2. The lower Yukon River drainage.

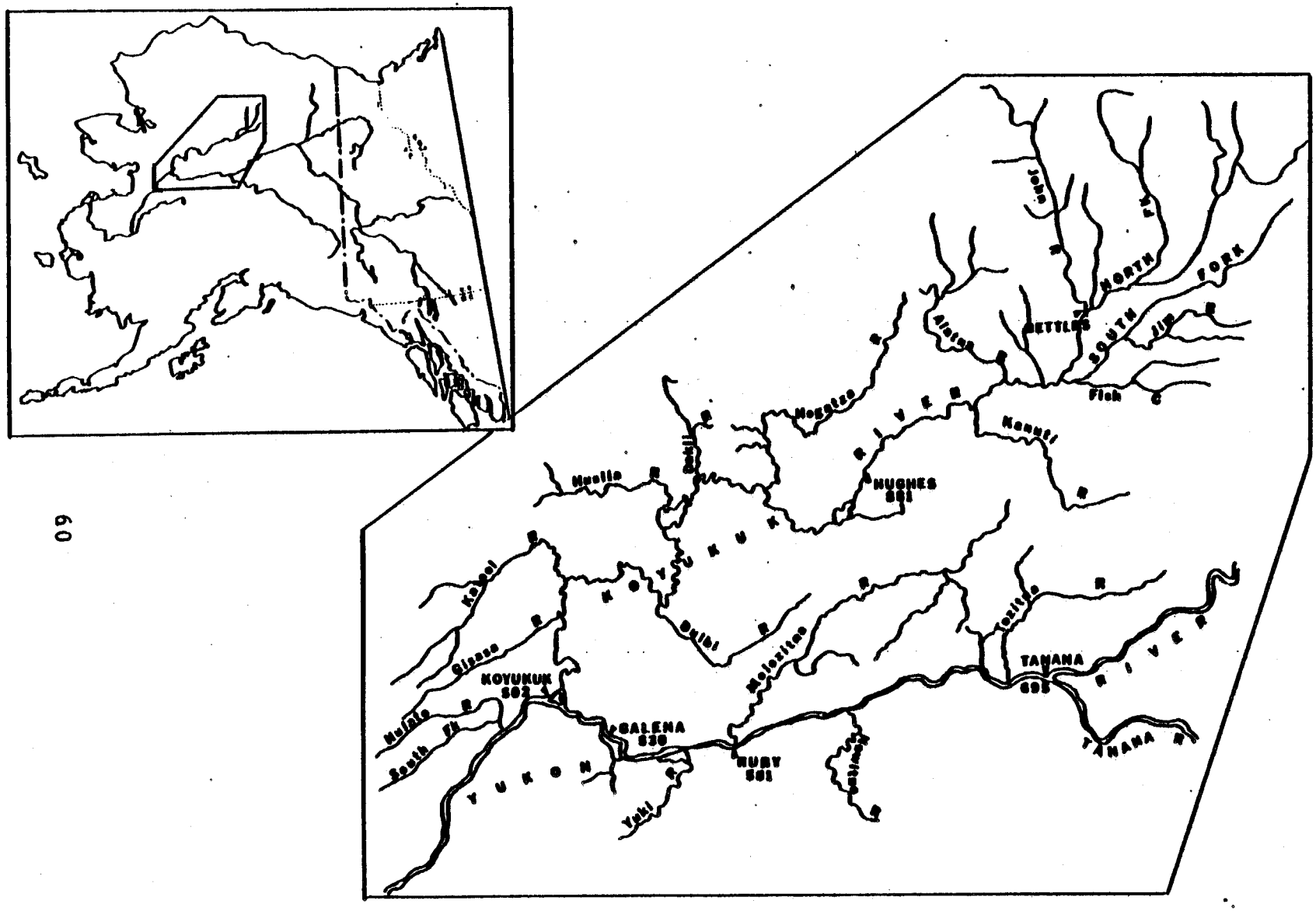


Figure 3. The Koyukuk River drainage.

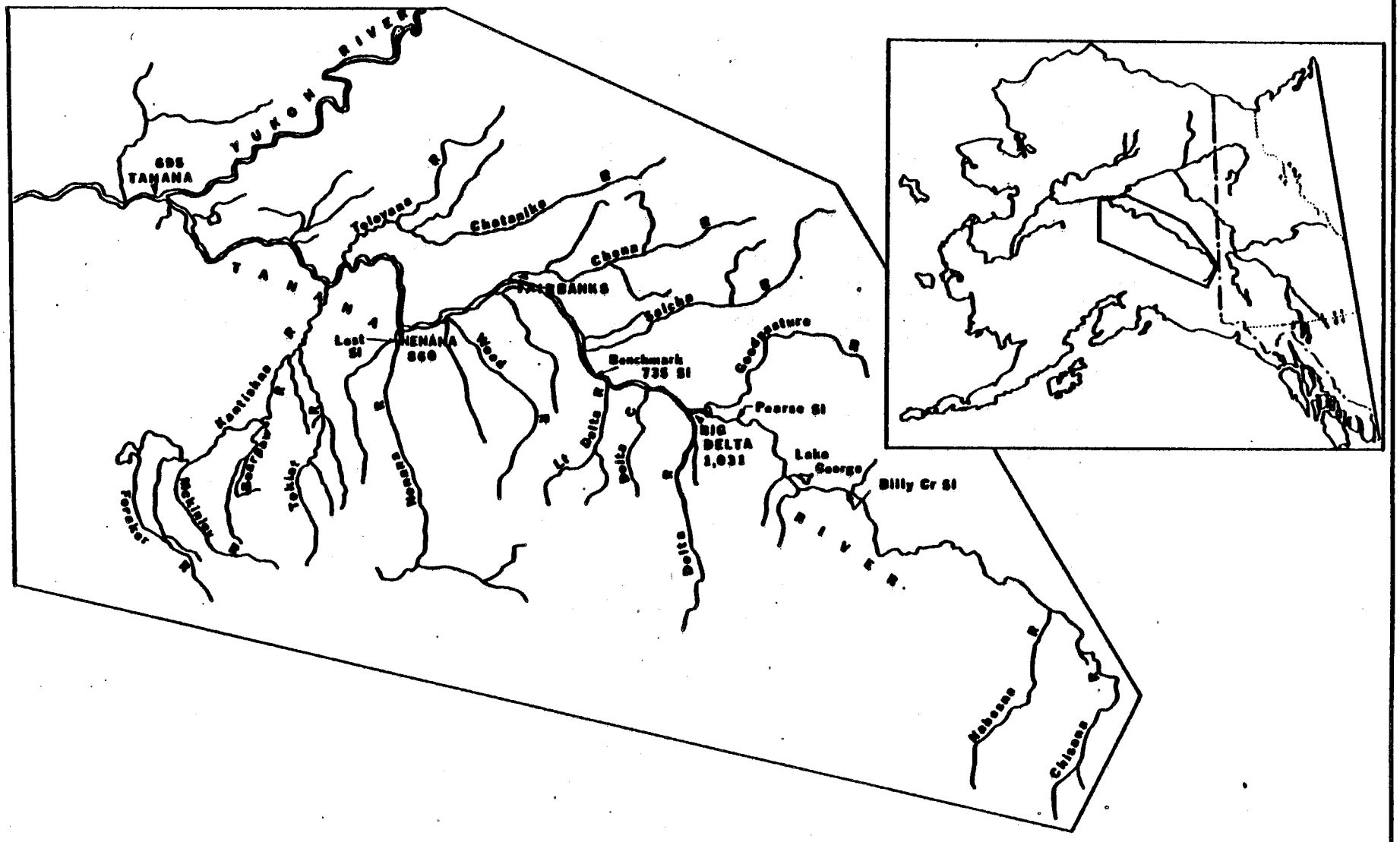


Figure 4. The Tanana River drainage.

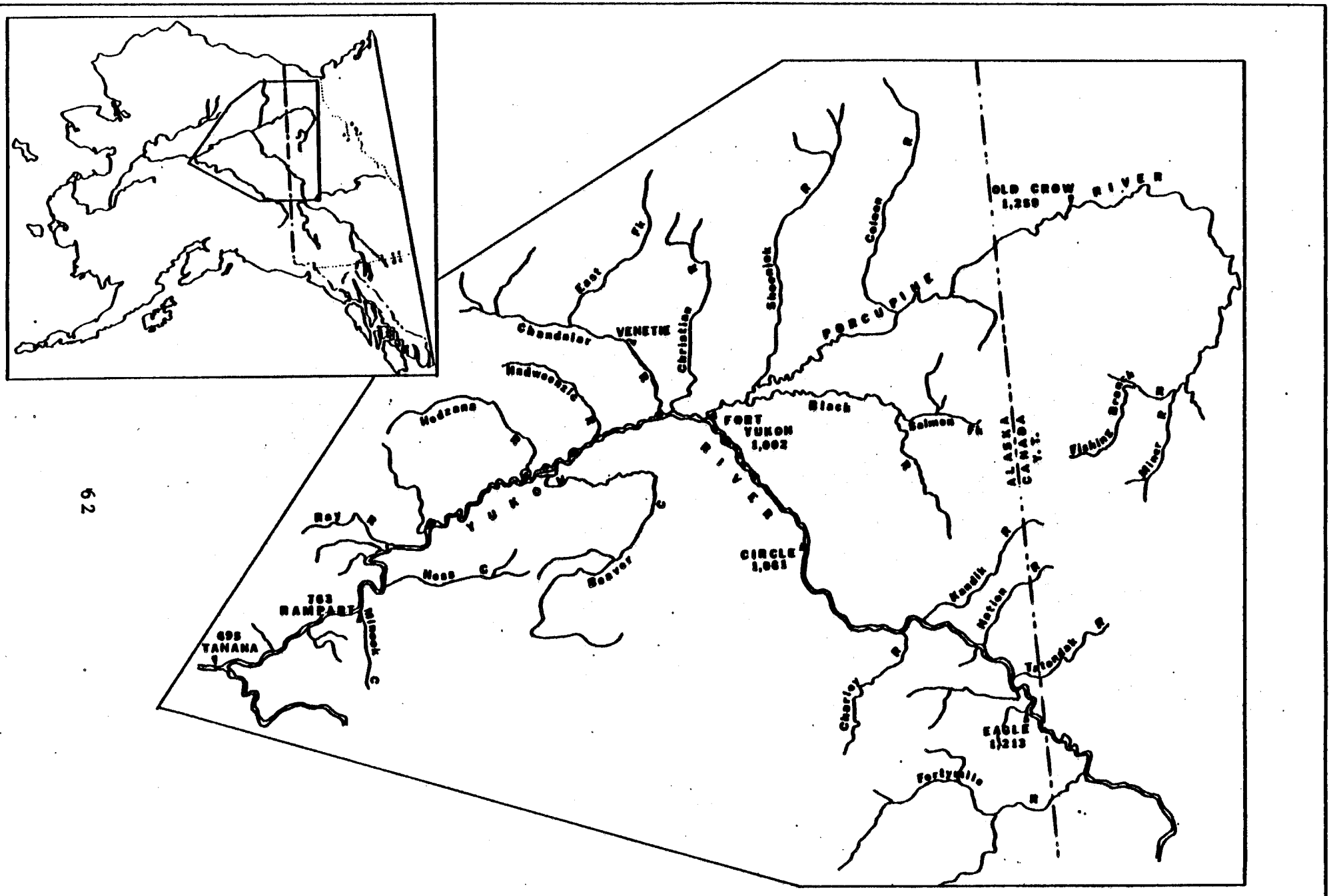


Figure 5. The middle Yukon River and Porcupine River drainage.

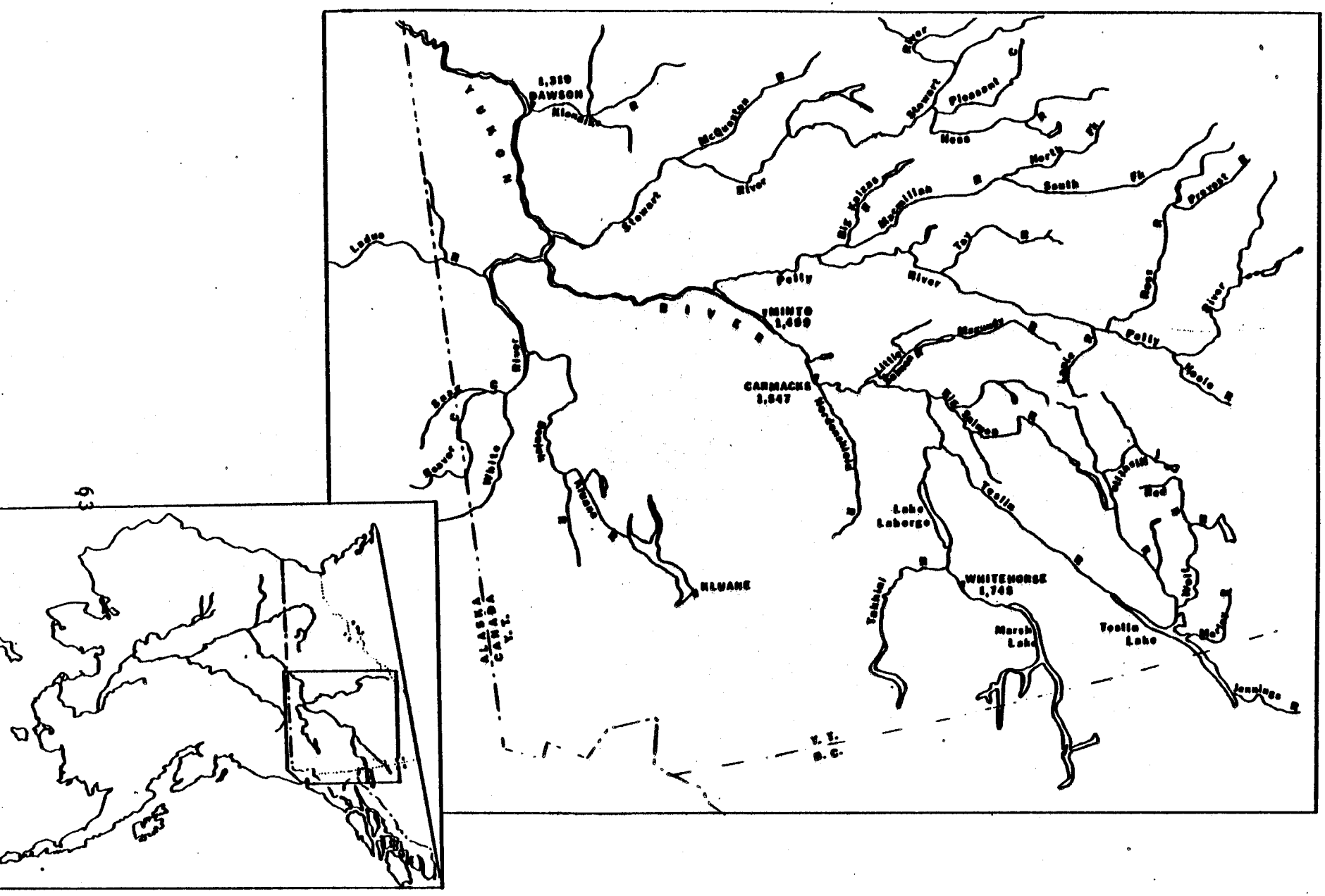


Figure 6. The upper Yukon River drainage.

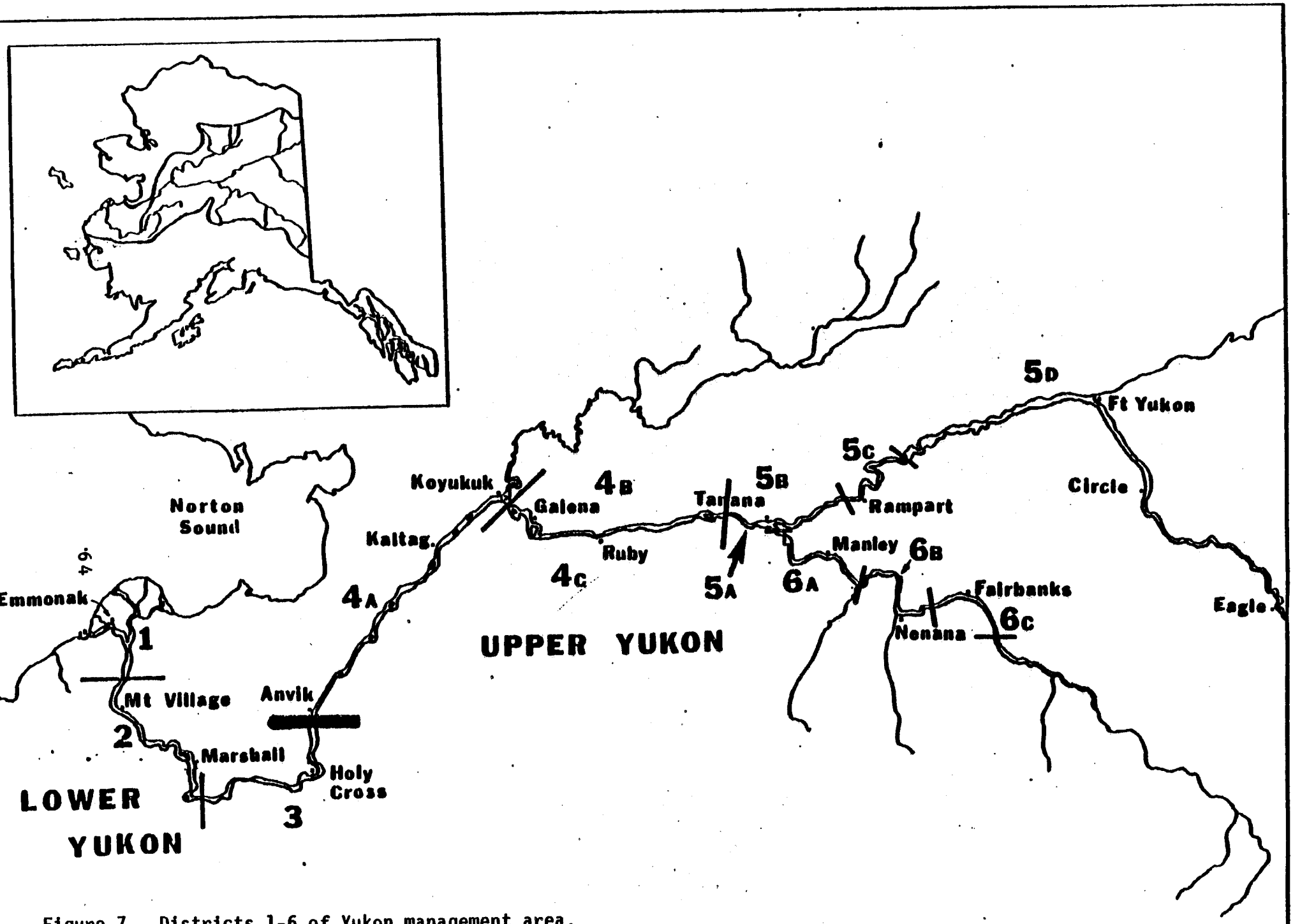


Figure 7. Districts 1-6 of Yukon management area.

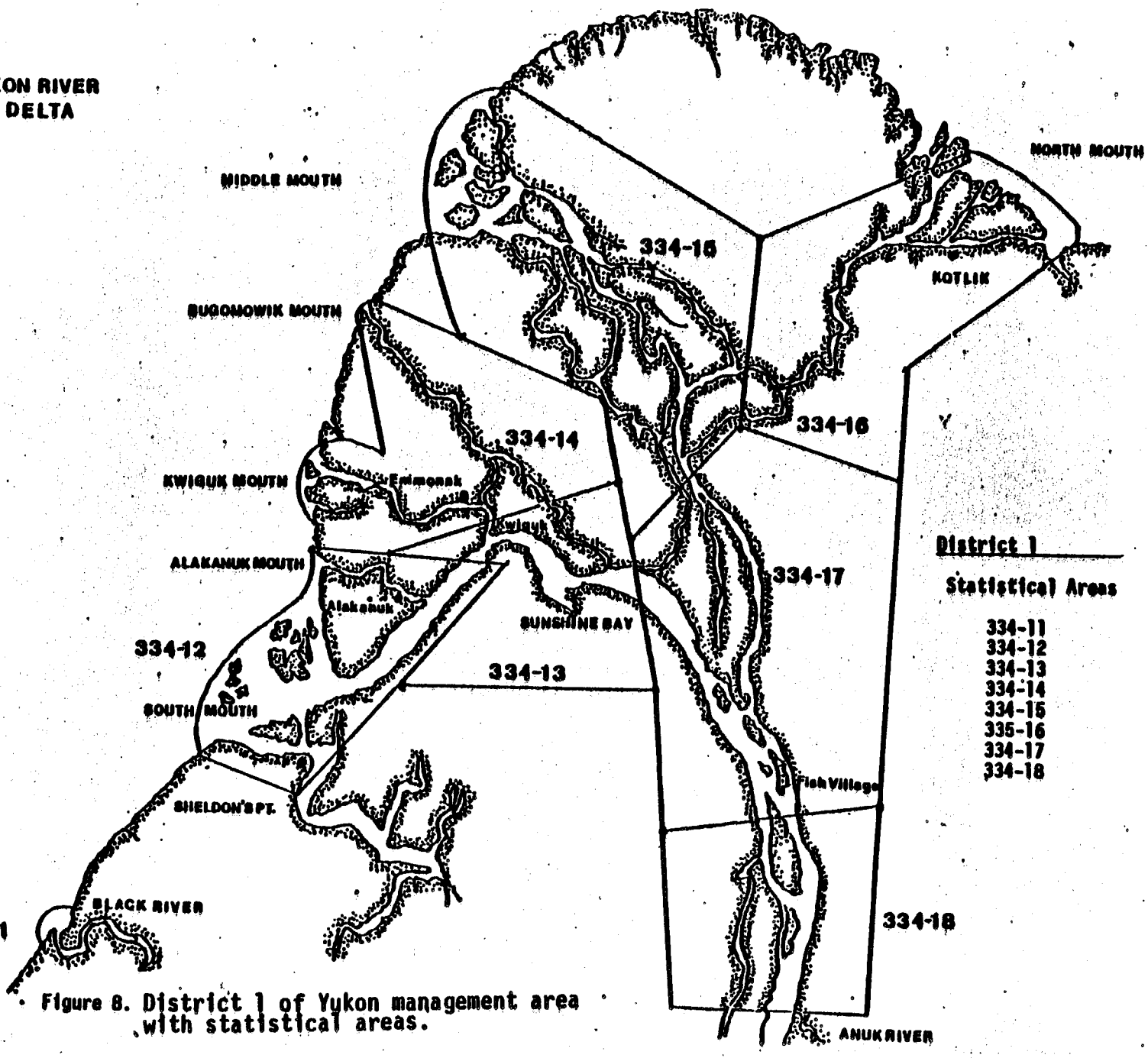


Figure 8. District 1 of Yukon management area with statistical areas.

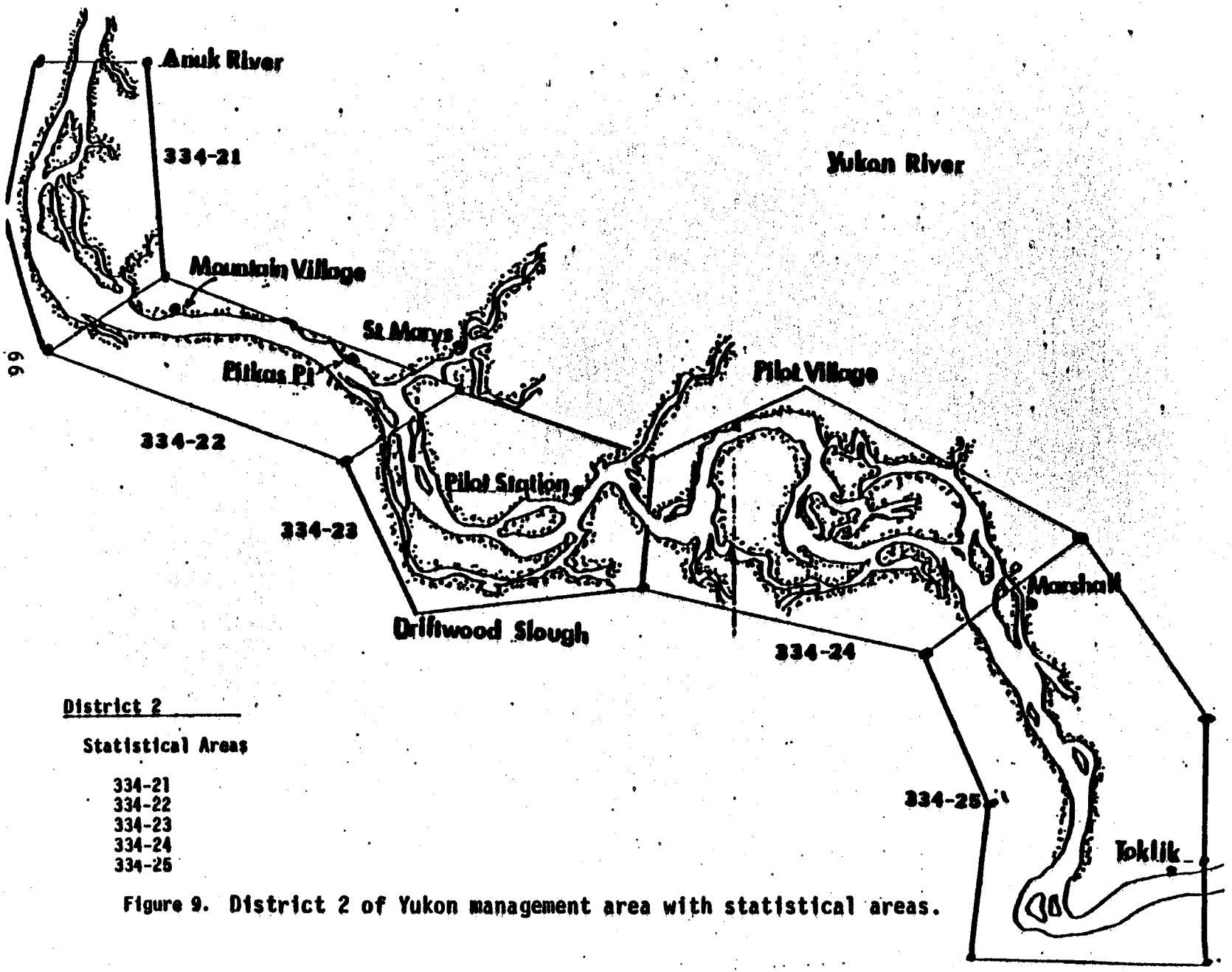


Figure 9. District 2 of Yukon management area with statistical areas.

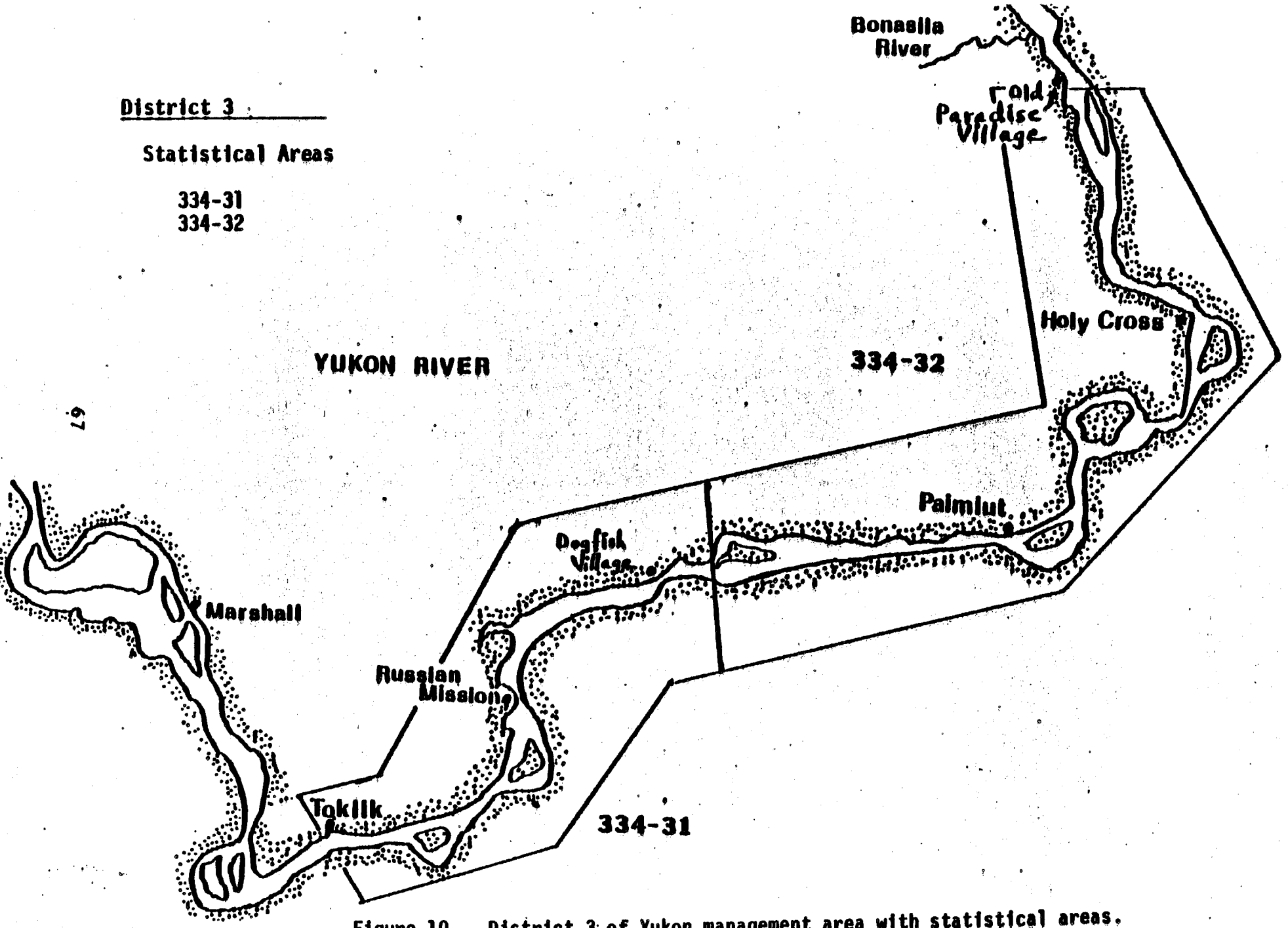


Figure 10. District 3 of Yukon management area with statistical areas.

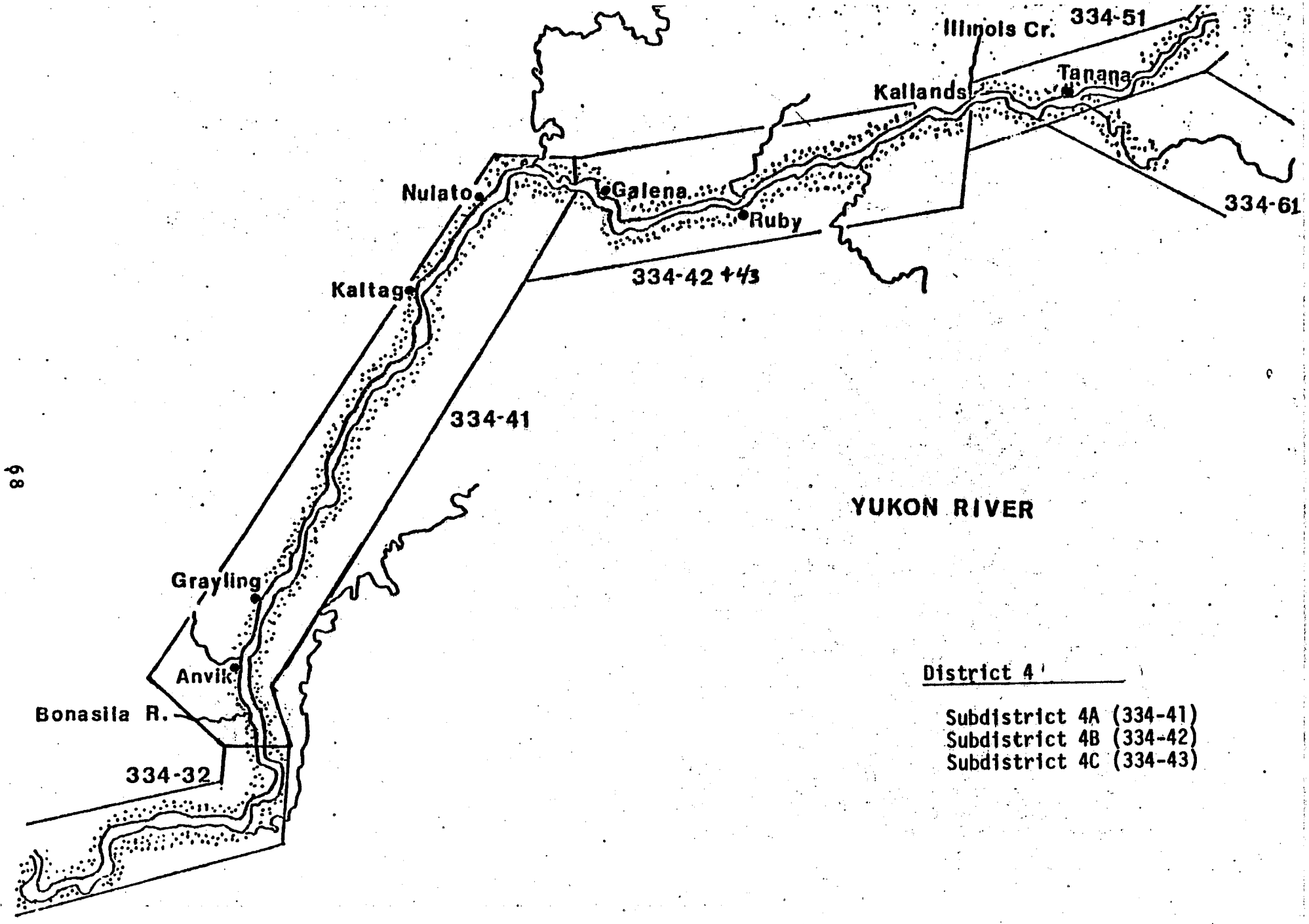


Figure 11. District 4 of Yukon management area with statistical areas.

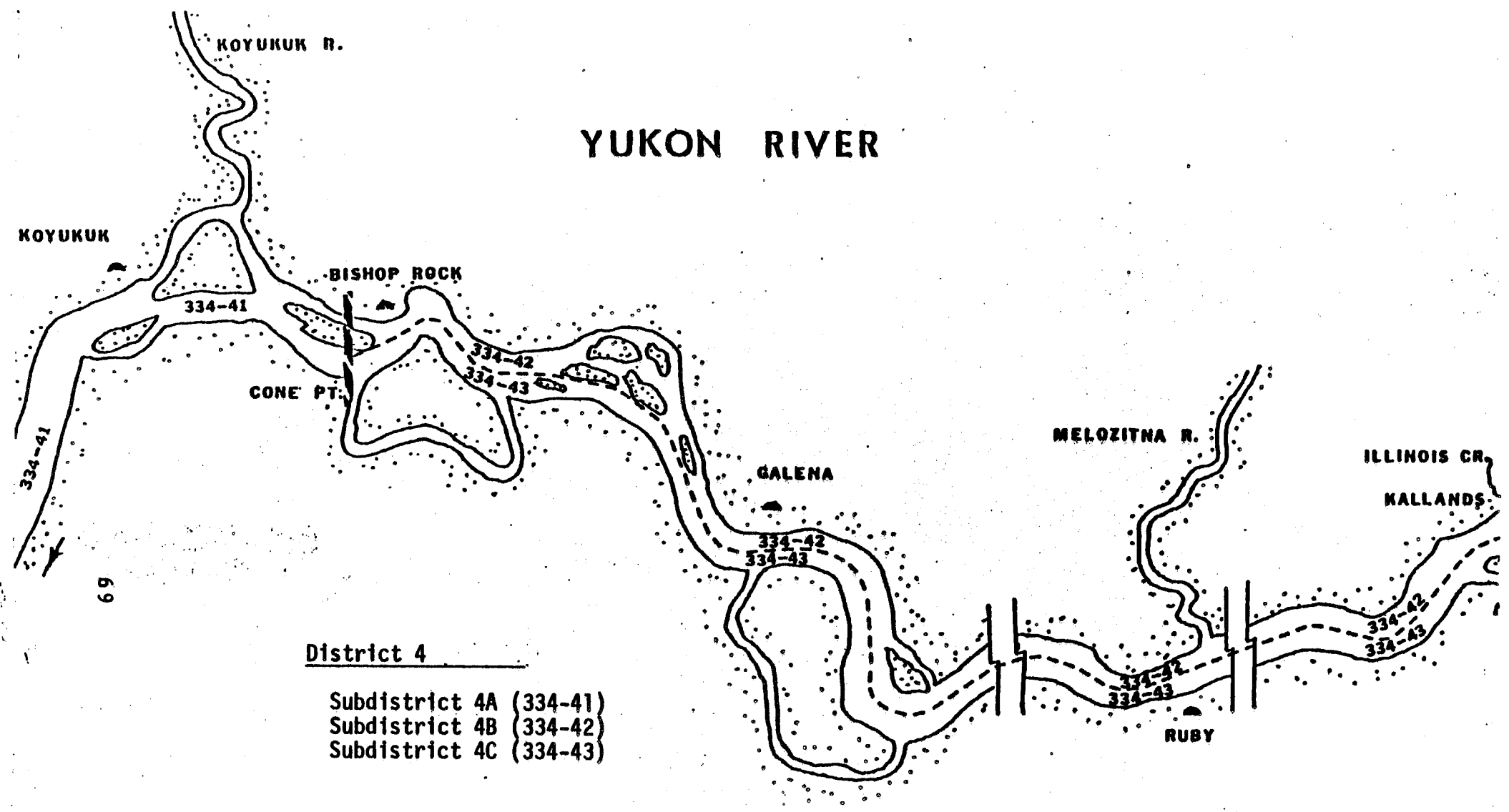


Figure 12. District 4 of Yukon management area with statistical areas.

District 5:

Subdistrict 5A (334-51)
Subdistrict 5B (334-52)
Subdistrict 5C (334-53)
Subdistrict 5D (334-54)

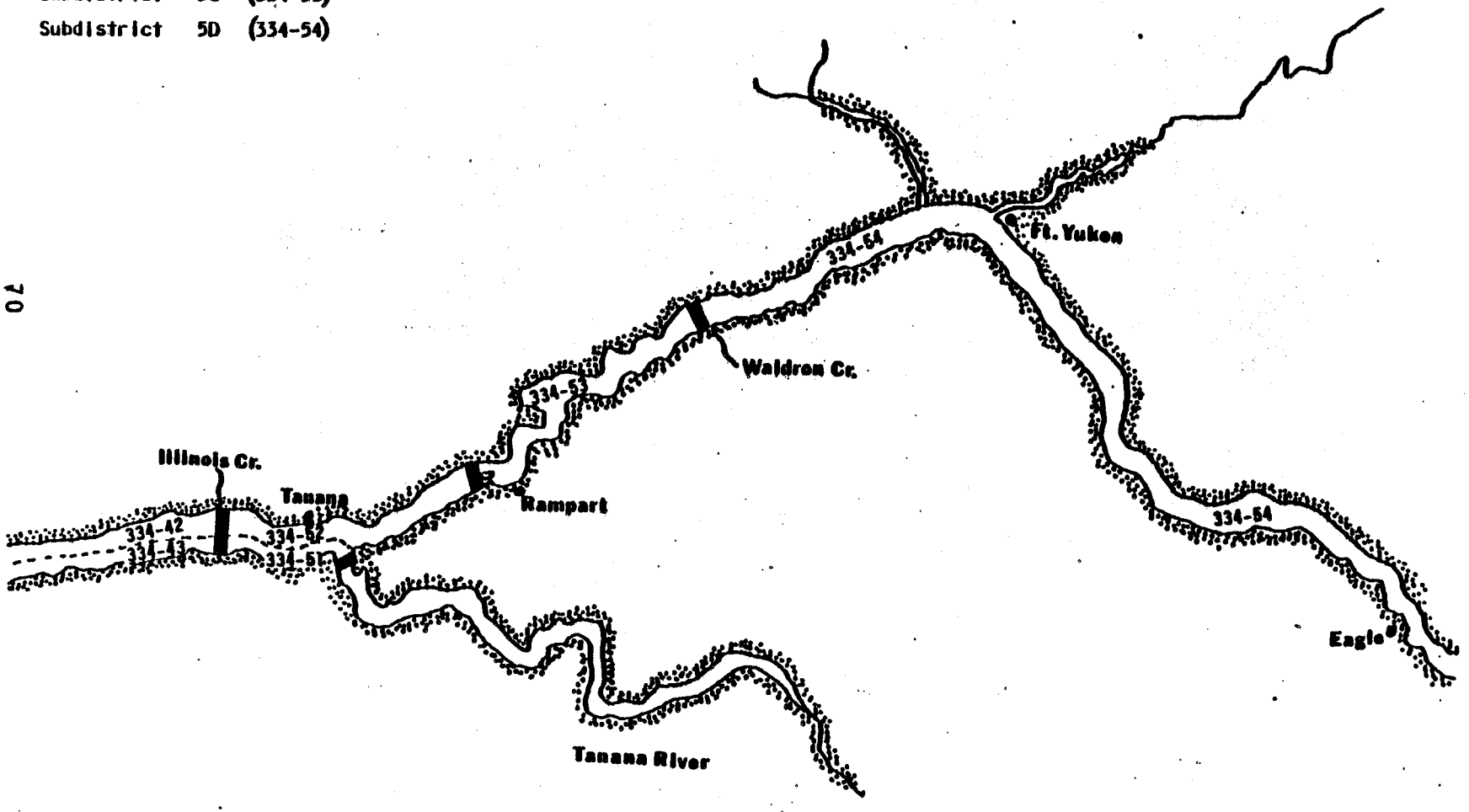
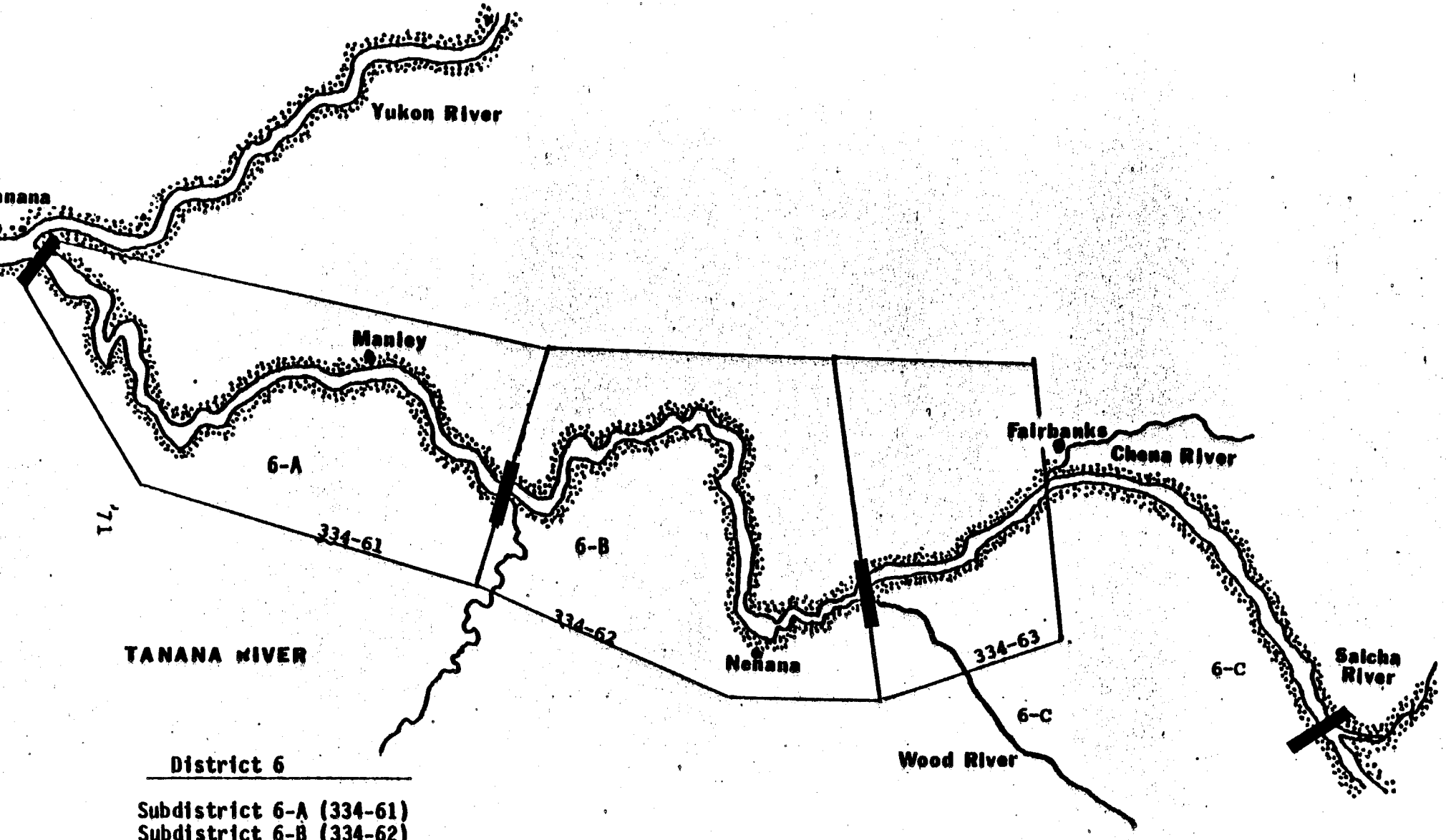


Figure 13. District 5 of Yukon management area with statistical areas.



District 6

Subdistrict 6-A (334-61)
Subdistrict 6-B (334-62)
Subdistrict 6-C
Wood River to Chena R. (334-63)

Figure 14. District 6 of Yukon management area with statistical areas.

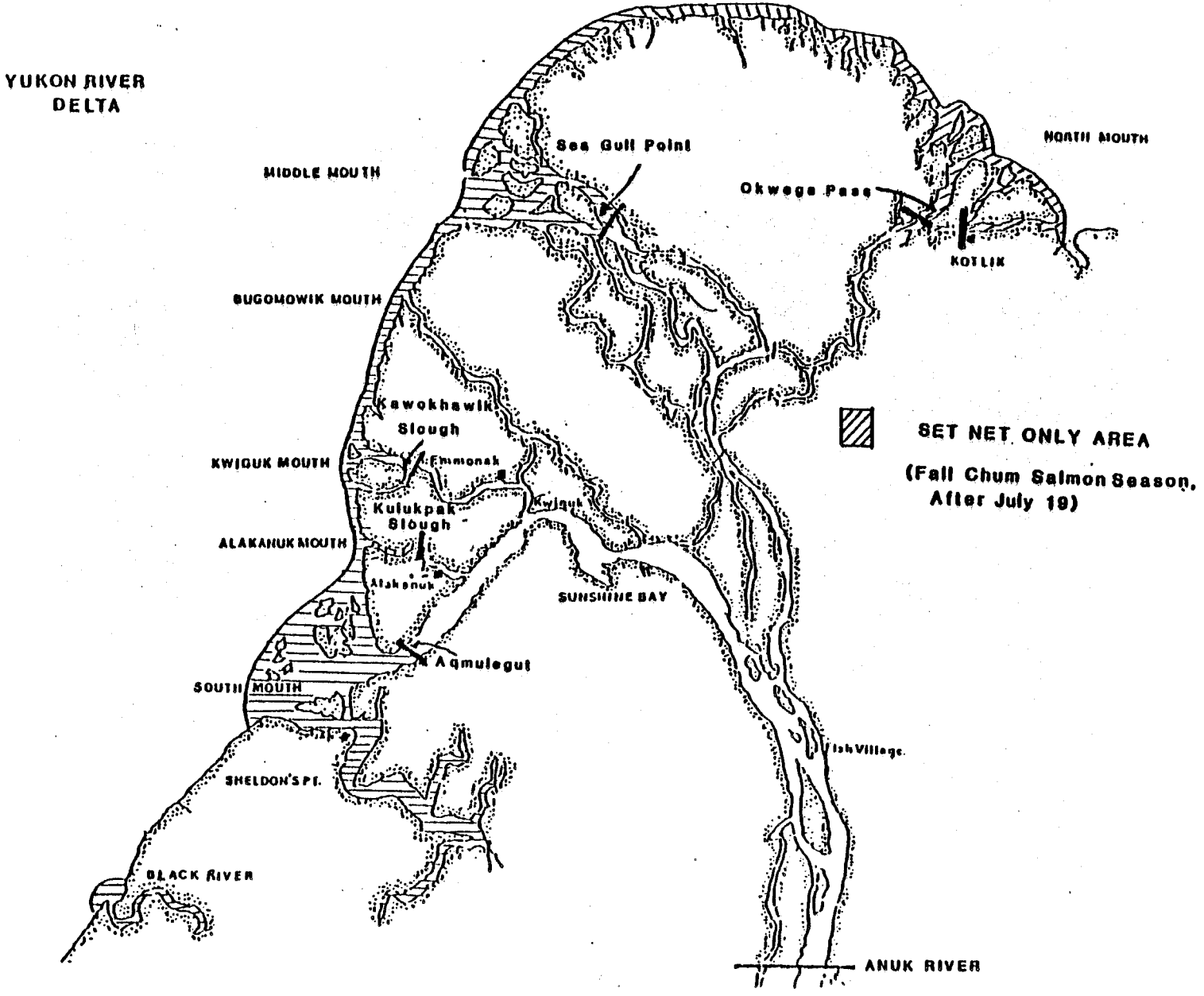


Figure 15. Set Net only Area, District 1 of the Yukon Management Area.

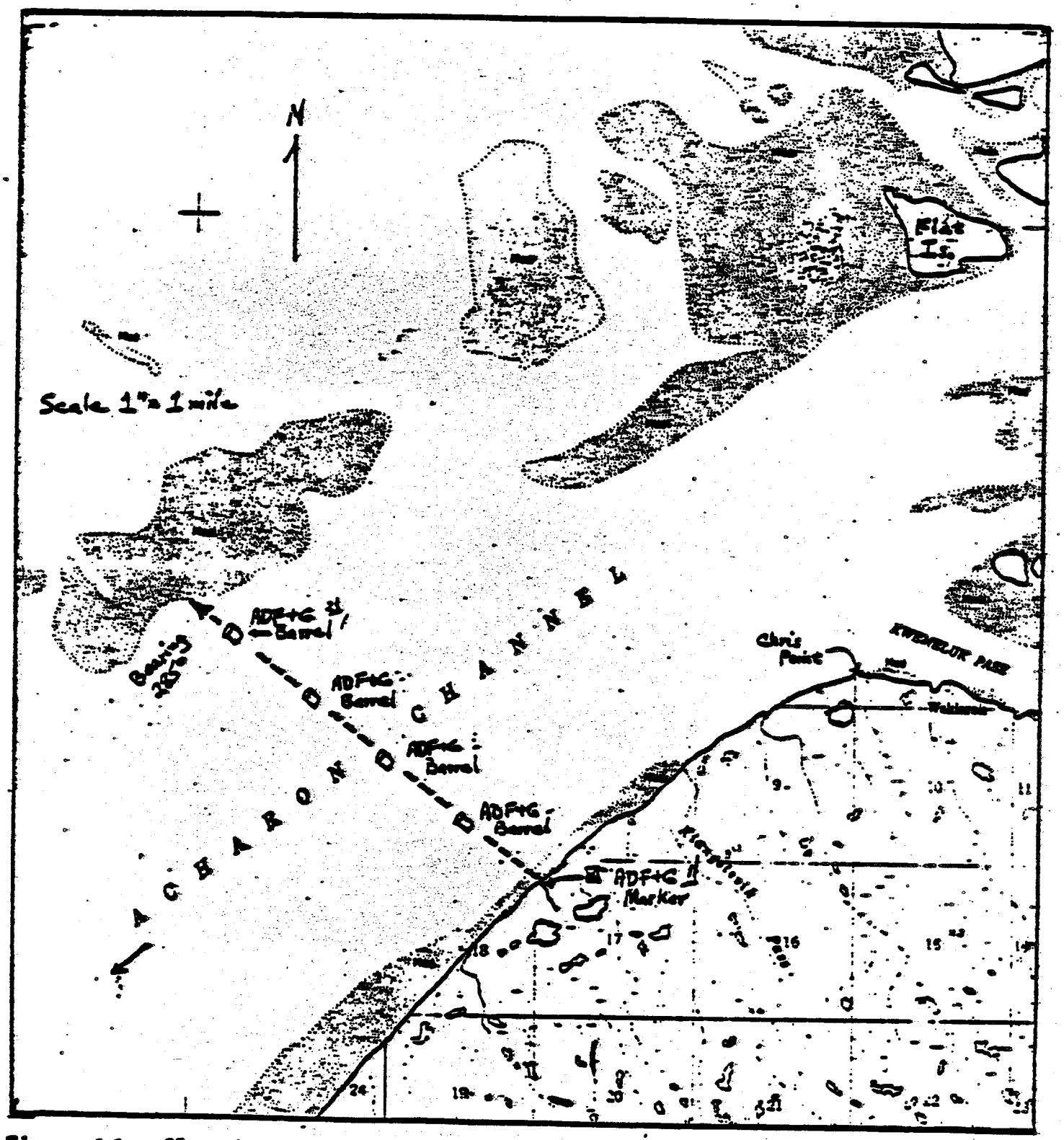


Figure 16. Closed waters Acharon Channel, south mouth Yukon River. (5AAC 05.350. CLOSED WATERS. (1) Acharon Channel of the south mouth area of the Yukon River west of a 2-1/2 nautical mile long line bearing 285° from an ADF&G regulatory marker located below Chris Point to the opposite side of the channel; the line may be marked by a series of yellow and green barrels placed by the Department between shore markers).

1/ ADF&G Regulatory Marker Sign, erected 5' height with driftwood logs, located on river bank at terminus of rivulet between two lakes approximately 2-1/2 miles below Chris Point.

2/ ADF&G yellow and green 55 gal. barrels anchored offshore.

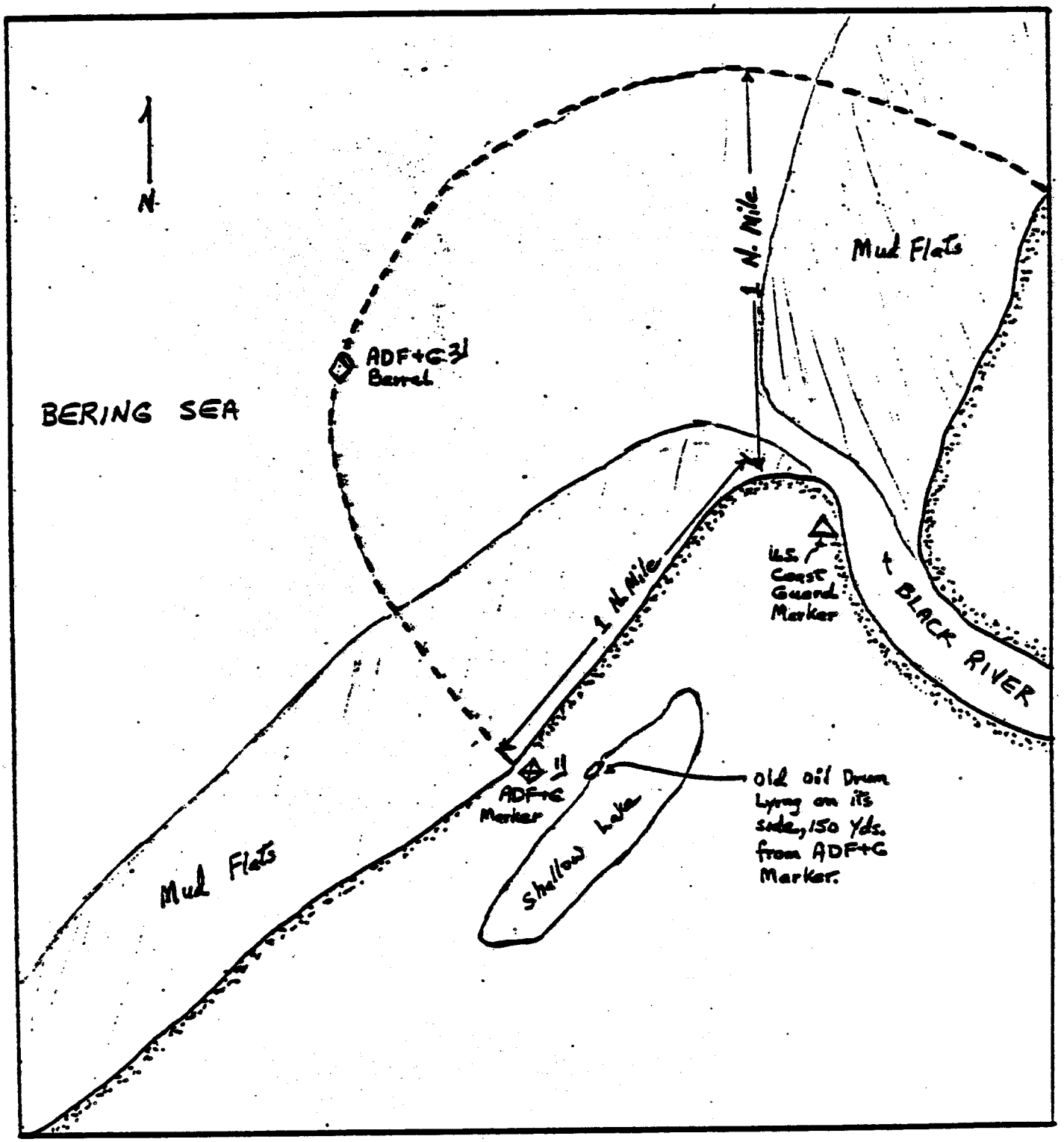


Figure 17. Closed waters of Black River mouth. (5AAC 05.350. CLOSED WATERS. (3) waters west of a one nautical mile radius from the mouth of Black River).

1/ ADF&G Regulatory Marker Sign erected 6' height with driftwood logs.

2/ ADF&G yellow and green 55 gal. barrel anchored 1 nautical mile offshore.

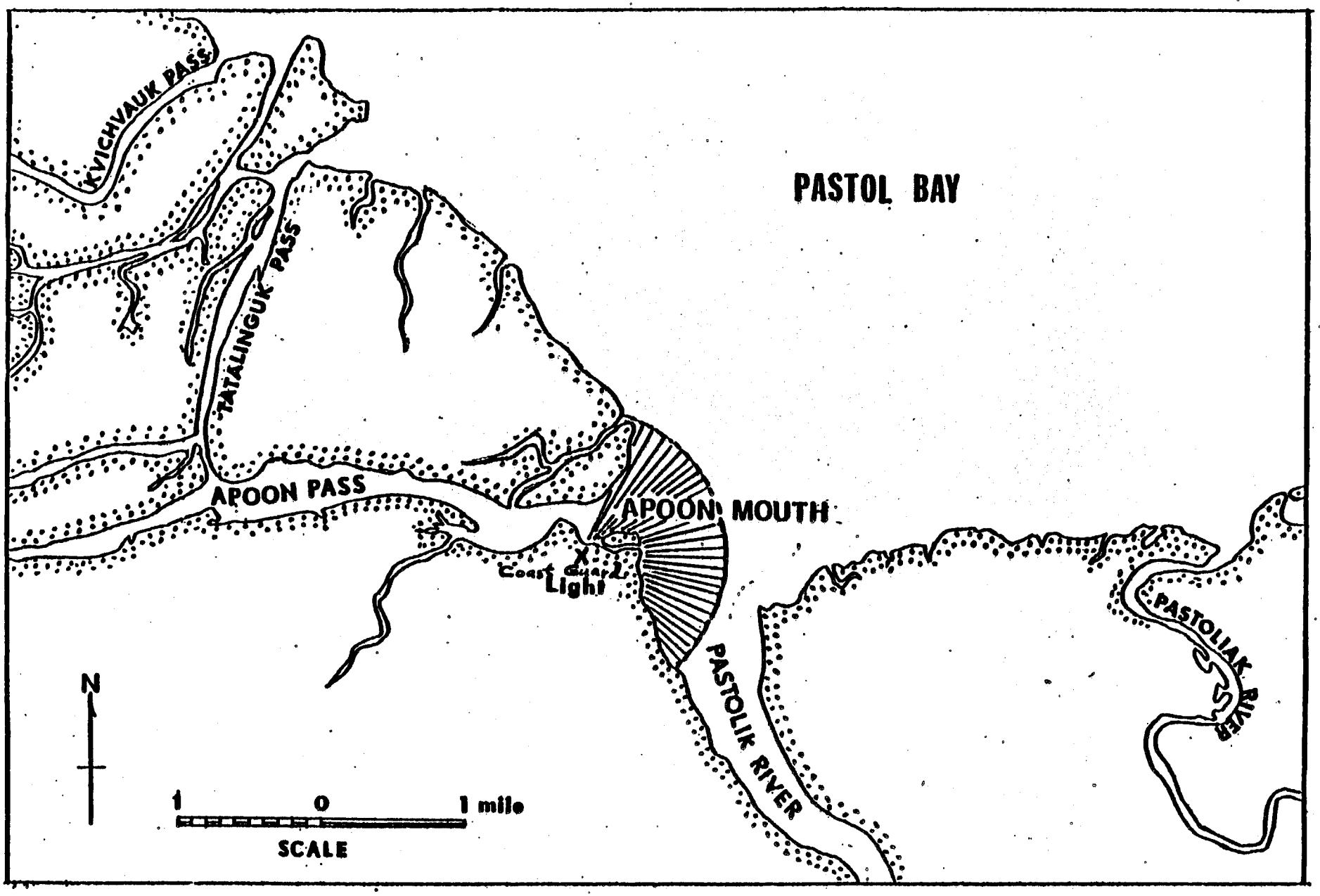


Figure 18. Closed waters of Apoon Mouth, Yukon River (5 AAC 05.350. CLOSED WATERS. (9) Waters east of a one nautical mile radius from a U.S. Coast Guard light at the mouth of Apoon Pass).

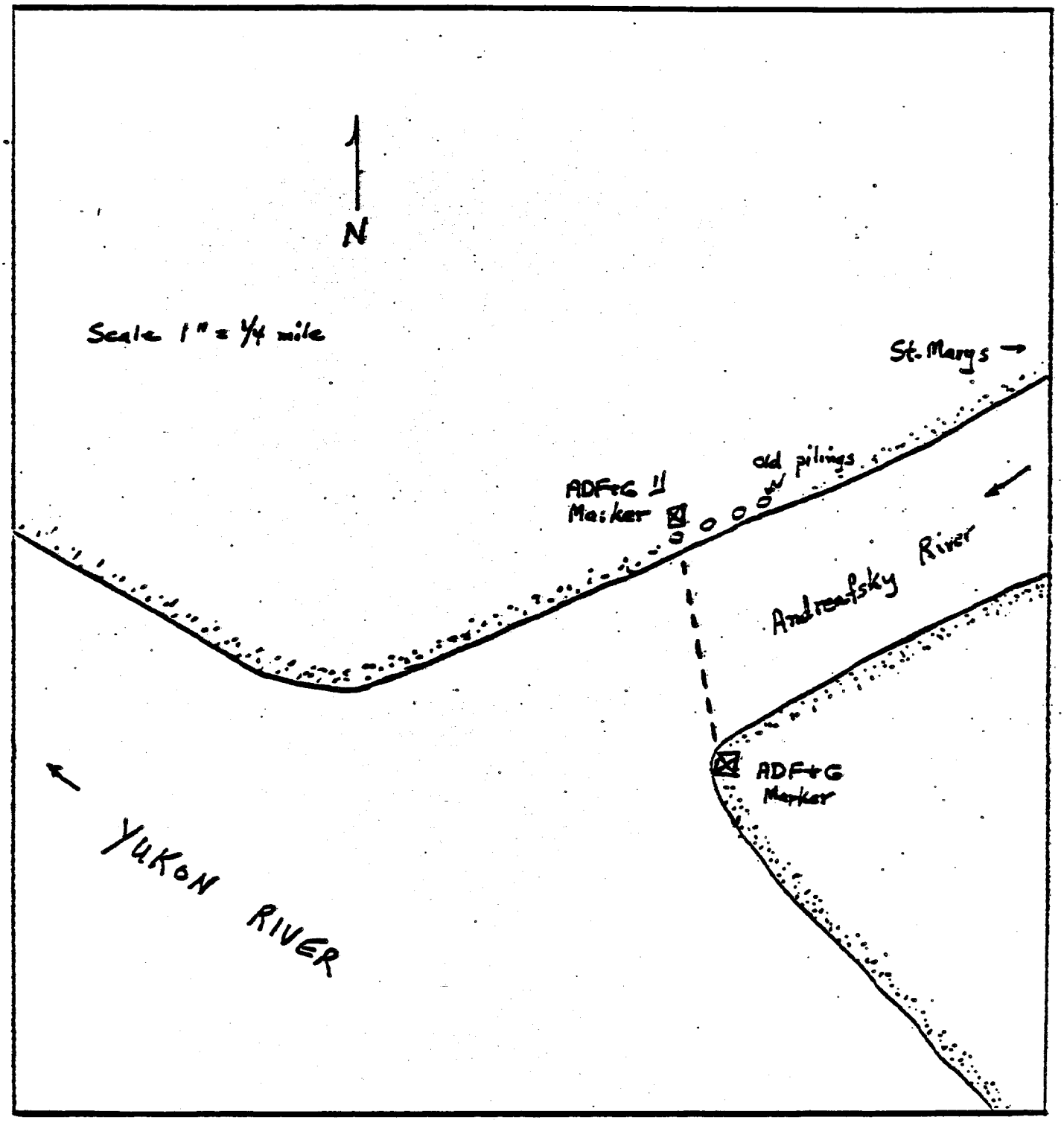


Figure 19. Closed waters of Andreafsky River mouth. (5AAC 05.350. CLOSED WATERS. (4) waters of the Andreafsky River upstream of a line from Department regulatory markers placed on each side of the river at its mouth).

1/ North bank ADF&G regulatory marker sign attached to 4th wooden piling stump downstream.

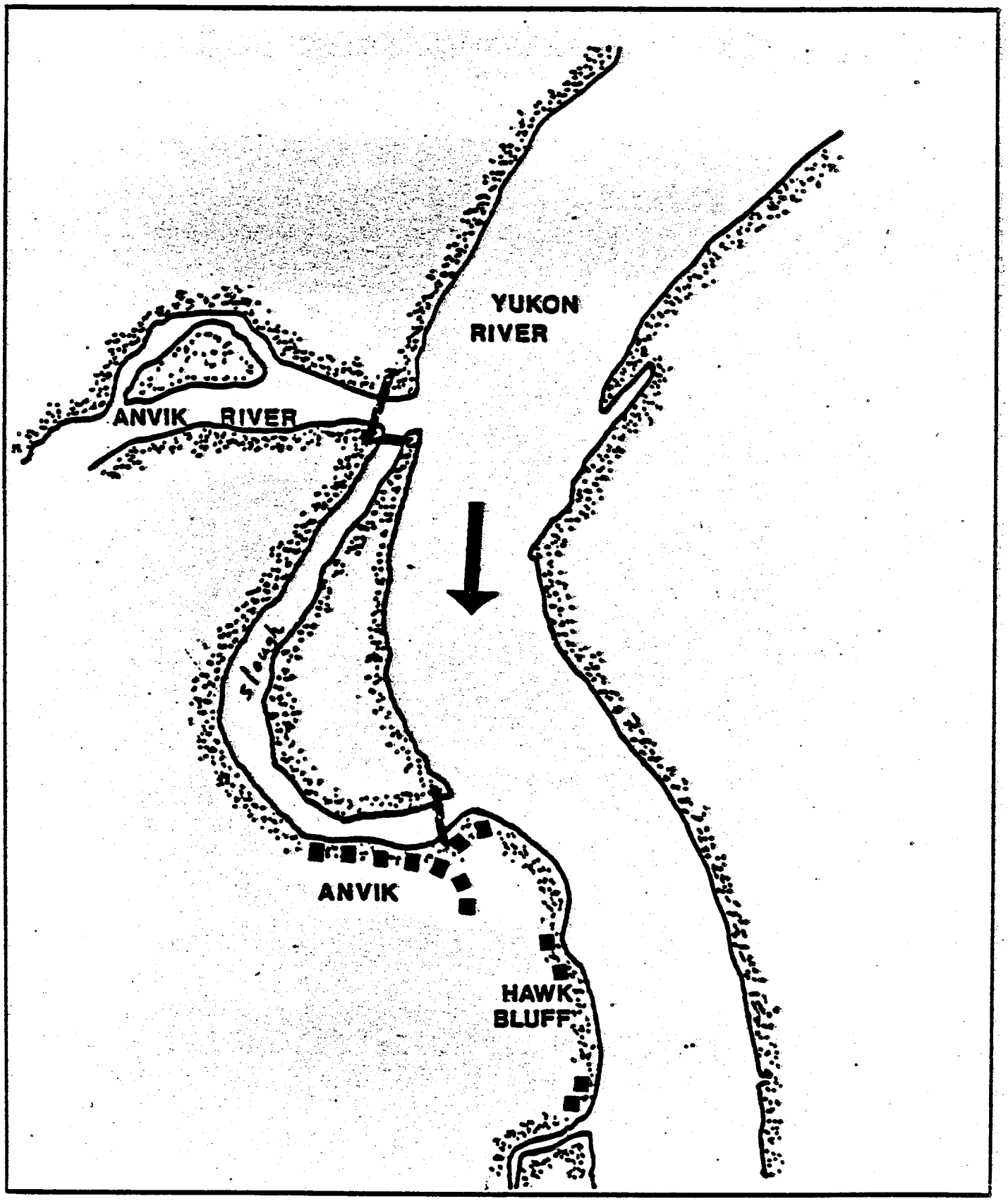


Figure 20. Closed waters of Anvik River mouth. (5AAC 05.350. (CLOSED WATERS.(8) waters of the Anvik River upstream of a line between department regulatory markers placed on each side of the river at its mouth). Markers (6) placed north and south banks of the Anvik River mouth and at upstream and downstream mouths of slough (Old Anvik River Channel).

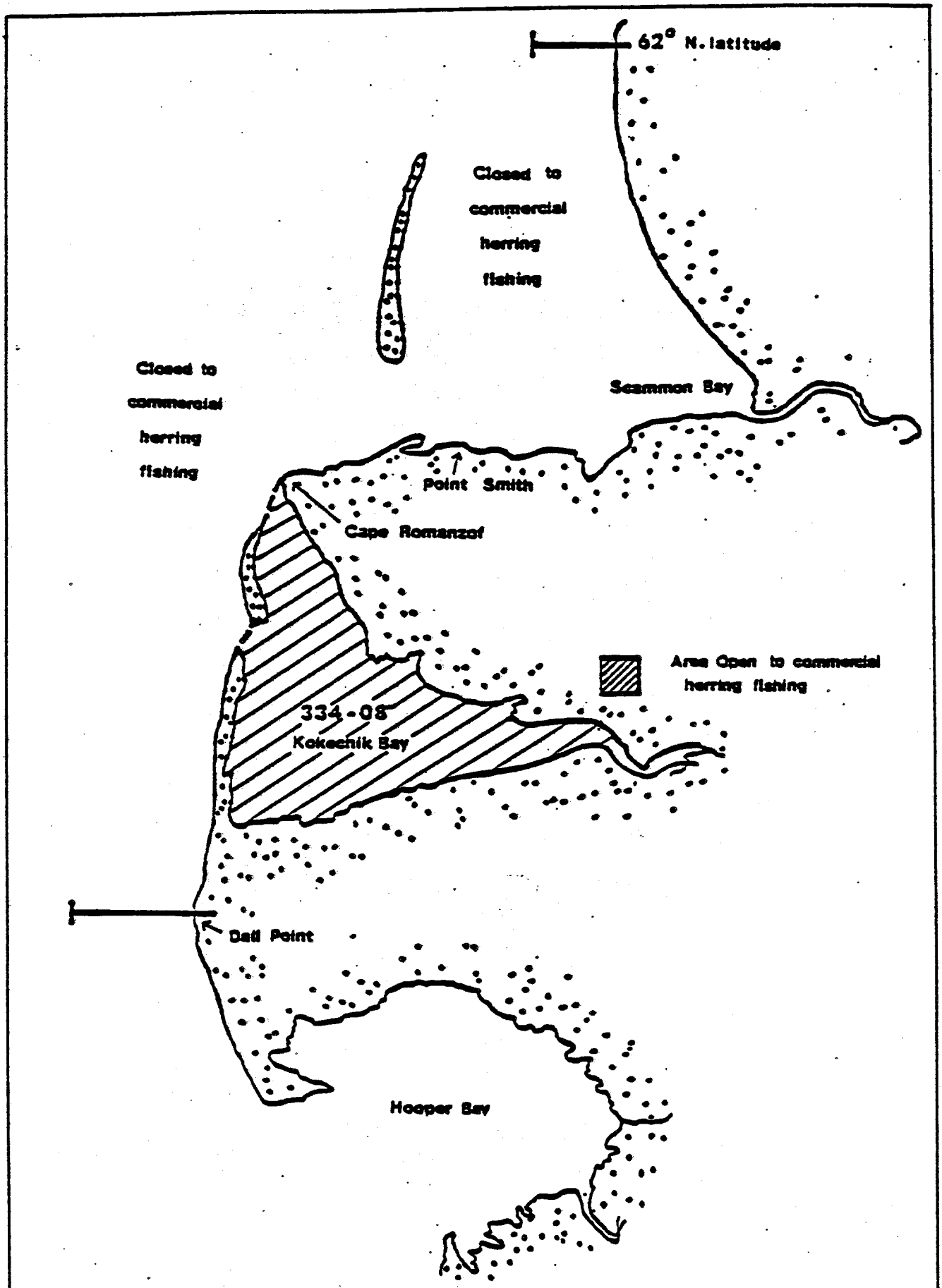


Figure 21. Cape Romenzof District.

Table 1. List of indigenous fishes found in the Yukon area. 1/

Species Code	Scientific Name	Common Name
601	Lampetra japonica	Arctic lamprey
570	Stenodus leucichthys	Sheefish
588	Coregonus nasus	Broad Whitefish
589	Coregonus pidschian	Humpback Whitefish
583	Coregonus sardinella	Least Cisco
585	Coregonus laurettae	Bering Cisco
586	Prosopium cylindraceum	Round Whitefish
587	Prosopium coulteri	Pygmy Whitefish
610	Thymallus arcticus	Arctic Grayling
550	Salvelinus namaycush	Lake Trout
520	Salvelinus alpinus	Arctic Char
530	Salvelinus malma	Dolly Varden
410	Oncorhynchus tshawytscha	King Salmon
420	Oncorhynchus nerka	Sockeye Salmon
430	Oncorhynchus kisutch	Coho Salmon
440	Oncorhynchus gorbusch	Pink Salmon
450	Oncorhynchus keta	Chum Salmon
513	Osmerus mordax dentex	Rainbow Smelt
514	Hypomesus olidus	Pond Smelt
500	Esox lucius	Northern Pike
630	Dallia pectoralis	Blackfish
650	Couesius plumbeus	Lake Chub
640	Catostomus catostomus	Longnose Sucker
670	Petcopsis omiscomaycus	Trout-Perch
590	Lota lota	Burbot, Lush
661	Pungitius pungitius	Nine-spine Stickleback
162	Cottus cognatus	Slimy Sculpin
ESTUARINE		
113	Eleginus gracilis	Saffron Cod
129	Platichthys stellatus	Starry Flounder
	Liopsetta glacialis	Arctic Flounder
230	Clupea pallasii	Pacific Herring
516	Mallotus villosus	Capelin

1/ Includes fishes found in the Yukon River drainage in Canada.

Table 2. Yukon River Drainage Mileages

Location	Mileages from Mouth
North Mouth (Apoon Pass)	
Kotlik	6
Hamilton	26
Middle Mouth (Kwikpak, Kawanak Pass)	
Choolunawick	16
Akers Camp	26
New Hamilton	34
South Mouth (Kwikluak Pass)	
Mouth, Black River	-18
Flat Island	0
Sheldon Point	5
Tin Can Point	8
Alakanuk	17
Emmonak-Kwiguk (Kwiguk Pass)	24
Sunshine Bay	24
Aproka Pass (upstream mouth)	35
Kwikpak Pass (upstream mouth)	44
Head of Passes	48
Fish Village	52
Mouth Anuk River (District 1/2 Boundary)	63
Patsys Cabin	71
Mountain Village	87
Old Andreafsky	97
Pitkas Point	103
Mouth, Andreafsky River	104
St. Marys	107
Pilot Station	122
Mouth, Atchuelinguk (Chulinak) River	126
Pilot Village	138
Marshall (Fortuna Ledge)	161
Upstream Mouth Owl Slough	163
Ingrihak	170
Ohogamut	185
Toklik (District 2/3 Boundary)	191
Kakamut	193
Russian Mission	213
Dogfish village	227
Paimuit	251
Mouth, Innoko River (South Slough)	274

Shageluk	328
Holikachuk	383
Holy Cross	279
Mouth, Koserefski River	286
Old Paradise Village (District 3/4 Boundary)	301
Mouth, Bonasila River	306
Anvik	317
Mouth, Anvik River	318
Grayling	336
Mouth, Thompson Creek	349
Blackburn	370
Eagle Slide	402
Mouth, Rodo River	447
Kaltag	450
Mouth, Nulato River	483
Nulato	484
Koyukuk	502
Mouth, Koyukuk River	508
Mouth, Gisasa River	564
Huslia	711
Mouth, Dakli River	755
Mouth, Hogatza River	780
Hughes	881
Mouth, Kanuti River	935
Alatna (Mouth, Alatna River)	956
Allakaket	956
Mouth, South Fork	986
Mouth, John River	1,117
Bettles	1,121
Middle Fork	1,141
Cold Foot	1,174
Wiseman	1,186
Bishop Rock	514
Prospect Point	519
Galena	530
Whiskey Creek	555
Mouth, Yuki River	562
Ruby	581
Mouth, Melozitna River	583
Horner Hot Springs	605
Kokrines	608
Mouth, Nowitna River	612
Birches	647
Kallands - Mouth of Illinois Creek (District 4/5 Boundary)	664
Mouth, Tozitna River	681
Tanana Village	695
Mouth, Tanana River (District 5/6 Boundary)	695
Manley Hot Springs	765
Mouth, Kantishna River	793
Mouth, Toklat River	838
Mouth, Sushana River	850
Mouth, Bearpaw River	887
Outlet, Lake Minchumina	959

Minto	835
Nenana	860
Mouth, Nenana River	860
Mouth, Wood River	894
Rosie Creek Bluffs	912
Mouth, Chena River (Fairbanks)	920
Mouth, Salcha River	965
Benchmark #735 Slough	991
Mouth, Little Delta River	1,000
Mouth, Delta Creek	1,014
Mouth, Clear Creek (Richardson-Clearwater)	1,015
Mouth, Shaw Creek	1,021
Mouth, Delta River (Big Delta)	1,031
Delta Junction	1,041
Mouth, Goodpaster River	1,049
Bluff Cabin Slough	1,050
Outlet, Clearwater Lake	1,052
Mouth, Clearwater Creek, (Delta Clearwater)	1,053
Mouth, Gerstle River	1,059
Outlet, Healy Lake	1,071
Outlet, Lake George	1,086
Tanacross	1,128
Outlet, Tetlin Lake	1,188
Mouth, Nabesna River	1,210
Northway Junction	1,214
Mouth, Chisana River	1,215
Mouth, Sheep Creek	1,297
Rampart Rapids	731
Rampart	763
Mouth, Hess Creek	789
Mouth, Ray River	817
Highway Bridge - Pipeline Crossing	820
Mouth, Dall River	841
Stevens Village	847
Mouth, Hodzana River	897
Beaver	932
Mouth, Hadweenzic River	952
Mouth, Chandalar River (Venetie Landing)	982
Venetie	1,025
Fort Yukon	1,002
Mouth, Porcupine River	1,002
Mouth, Black River	1,026
Chalkyitsik	1,084
Mouth, Salmon River	1,142
Mouth, Salmon Trout River	1,193
Mouth, Sheenjek River	1,054
Mouth, Coleen River	1,157
U.S.-Canadian Border	1,219
Old Crow	1,259
Fishing Branch River spawning area	1,600
Circle	1,061
Woodchopper	1,110
Mouth, Charley River	1,124

Mouth, Kandik River	1,135
Mouth, Nation River	1,166
Mouth, Tatonduk River	1,186
Mouth, Seventymile River	1,194
Eagle	1,213
U.S.-Canadian Border	1,224
Mouth Fortymile River	1,269
Dawson	1,319
Mouth, Klondike River	1,320
Mouth, Sixty Mile River	1,369
Mouth, Stewart River	1,375
McQuesten	1,465
Stewart Crossing	1,491
Mayo	1,520
Mouth, Hess River	1,594
Mouth, White River	1,386
Mouth, Donjek River	1,455
Mouth Kluane River	1,541
Outlet Kluane Lake	1,587
Burwash Landing	1,595
Kluane	1,625
Fort Selkirk	1,477
Mouth, Pelly River	1,478
Pelly Crossing	1,410
Mouth, MacMillan River	1,442
Ross River	1,602
Minto	1,499
Mouth, Tatchun Creek	1,530
Carmacks	1,547
Mouth, Little Salmon River	1,583
Mouth, Big Salmon River	1,621
Mouth, North Big Salmon River	1,641
Mouth, South Big Salmon River	1,657
Outlet, Big Salmon Lake	1,714
Mouth, Teslin River	1,654
Roaring Bull Rapids	1,707
Johnson's Crossing (Outlet, Teslin Lake)	1,756
Teslin	1,780
Mouth Nisutlin River	1,788
Mouth, Sidney Creek	1,837
Mouth, Hundred Mile Creek	1,851
Mouth, McNeil River	1,887
Outlet, Nisutlin Lake	1,892
Outlet, Lake Laberge	1,679
Inlet, Lake Laberge	1,712
Mouth, Takhini River	1,718
Whitehorse	1,745
Mouth, M'Clintock River	1,769
Outlet, Marsh Lake	1,764
Outlet, Little Atlin Lake	1,788
Outlet, Atlin Lake	1,812
Atlin	1,844
Tagish	1,786
Outlet, Tagish Lake	1,788
Carcross (Outlet Lake Bennett)	1,810
Bennett	1,835

Table 3. Yukon area processors and associated data, 1987.

Commercial operation (Processing location/ buying station)	Product	District
Blue Pacific Industries 701 Roeder Ave. Bellingham, WA 98225 (P/V Icy Cape, M/V Alaska Queen, M/V Chisik Island, M/V Tuxedni)	Sac Roe Herring (frozen)	Cape Romanzof
Dutch Harbor Seafoods, Ltd. P.O. Box 97019 Redmond, WA 98073 (M/V Hipac)	Sac Roe Herring (frozen)	Cape Romanzof
Icicle Seafoods, Inc. 4019 21st Ave. W. Seattle, WA 98199 (M/V Lady Ann, M/V Viking Queen, M/V Chichagof)	Sac Roe Herring (frozen)	Cape Romanzof
Lafayette, Inc. 3837 13th W.,Suite 104 Seattle, WA 98119 (P/V Pribilof, P/V Lafayette, M/V Northwind, M/V Tracy D., M/V Alaska Pacific, M/V Zingaro)	Sac Roe Herring (frozen)	Cape Romanzof
New West Fisheries, Inc. 1100 11th Street Bellingham, WA 98225 (P/V New West, M/V Lois Anderson, M/V Seldovia)	Sac Roe Herring (frozen)	Cape Romanzof
Pan Pacific Seafoods, Inc. 720 Third Ave., Suite 1603 Seattle, WA 98104 (P/V Nicolle N., M/V Polar Shell, M/V Vi Va Yo, M/V Snow Mist, M/V Sea Trek III, M/V H. H. Aki, M/V Ocean Challenger)	Sac Roe Herring (frozen)	Cape Romanzof
Seward Marine Services, Inc. P.O. Box 87 Seward, AK 99664 (P/V Snopac Alaska, M/V Red Baron, M/V Makaka, M/V Midas, M/V Deer Harbor)	Sac Roe Herring (frozen)	Cape Romanzof

Table 3. Yukon area processors and associated data, 1987 (Continued).

Commercial operation (Processing location/ buying station)	Product	District
Trident Seafoods 5303 Shilshole Ave. NW Seattle, WA 98107 (P/V Bristol Monarch, M/V Arctic Sun, M/V Pankoff, M/V Alaska Eagle, M/V Tamar)	Sac Roe Herring (frozen)	Cape Romanzof
YAK, Inc. 4019 21st Ave. W. Seattle, WA 98119 (P/V Yard Arm Knot, M/V Blue Fin, M/V Cape St. John, M/V Yankee Clipper)	Sac Roe Herring (frozen)	Cape Romanzof
Yukon Delta Fish Marketing Co-op, Inc. P.O. Box 169 Emmonak, AK 99581 (Emmonak)	Frozen Salmon Chinook Chum Coho Salmon Roe	1 and 2
Amukon Trading Post General Delivery Scammon Bay, AK 99662 (Black River)	Hard Salt Chinook Chum Coho	1
Bering Sea Fisheries, Inc. 4413 83rd Ave. SE Everett, WA 98205 (Lamont Slough)	Frozen Salmon Chinook Chum Coho Salmon Roe	1 and 2
ANPAC, Inc. P.O. Box 92520 Anchorage, AK 99509 (Emmonak)	Fresh Salmon Chinook Chum Coho	1 and 2
Schenk Seafood Sales, Inc. P.O. Box 984 Bellingham, WA 98227 (Mountain Village)	Frozen Salmon Chinook Chum Coho Salmon Roe	1 and 2
Boreal Fisheries P.O. Box 561 Graham, WA 98338 (Old Andreafsky)	Fresh Salmon Chinook Chum Coho	1 and 2

Table 3. Yukon area processors and associated data, 1987 (Continued).

Commercial operation (Processing location/ buying station)	Product	District
Yupik Star Fisheries P.O. Box 168 Alakanuk, AK 99554 (Alakanuk)	Frozen Salmon Chinook Chum Coho Salmon Roe	1
Nakamura & Associates, Inc. 811 First Ave., Suite 400 Colman Building Seattle, WA 98104 (Marshall)	Fresh Salmon Chinook Chum Coho Salmon Roe	2 and 3
Y-K Fisheries P.O. Box 213 McGrath, AK 99627 (St. Marys)	Fresh Salmon Chinook Chum Coho Salmon Roe	1 and 2
Fish Products Ltd. (Chet Clark) P.O. Box 19 Aniak, AK 99557 (Holy Cross/Anvik)	Smoked Salmon Chinook Salmon Roe	3 and 4
Walton Seafoods P.O. Box 258 McGrath, AK 99827 (Anvik)	Salmon Roe	4
Reinhard Rupprecht P.O. Box 51 Nenana, AK 99760 (Kallands)	Frozen Salmon Chinook	4
Great Northern Seafoods 2604 Fairbanks St. Suite B Anchorage, AK 99503	Salmon Roe	4
Whitney Foods P.O. Box 190429 Anchorage, AK 99519-0429	Fresh Frozen Salmon	4
Northwest Endeavors P.O. Box 870709 Wasilla, AK 99687	Salmon Roe Frozen Salmon Chum	4

Table 3. Yukon area processors and associated data, 1987 (Continued).

Commercial operation (Processing location/ buying station)	Product	District
Towa America, Inc. 424 East Manor Ave. Anchorage, AK 99501	Salmon Roe Frozen Salmon Chinook Chum	4
Umphenour and Marshall International 878 Lynnwood Way North Pole, AK 99705 (North Pole)	Salmon Roe Frozen Salmon Chinook Chum Coho	5 and 6
Yutana Fisheries P.O. Box 82445 College, AK 99708 (Manley)	Salmon Roe Frozen Salmon Chinook Chum Coho	5 and 6
George Attla 2906 Whitman Road North Pole, AK 99705 (Yukon River Bridge)	Frozen Salmon Chinook	5
Circle Fish Co. P.O. Box 14 Circle, AK 99733 (Circle)	Frozen Salmon Chinook	5
Eagle Seafoods P.O. Box 4085 Soldotna, AK 99669	Salmon Roe Frozen Salmon Chinook Chum	5 and 6
Aurora Meat & Seafoods 1260 Aurora Drive Fairbanks, AK 99701	Frozen Salmon Chinook	5
Ludecker Fish Co. 2875 Ludecker Road Fairbanks, AK 99709	Frozen Salmon Chinook Chum Coho	6
T.J. Clark and Sons Route 2 Nenana, AK 99760 (Nenana)	Salmon Roe Frozen Salmon Chinook Chum Coho	6

Table 3. Yukon area processors and associated data, 1987 (Continued).

Commercial operation (Processing location/ buying station)	Product	District
Aurora Fisheries P.O. Box 83618 Fairbanks, AK 99708	Salmon Roe Frozen Salmon Chinook Chum	6
Denny Mac Enterprizes, Inc. P.O. Box 289 Nenana, AK 99760	Salmon Roe Frozen Salmon Chinook Chum Coho	6

Table 4. Yukon area commercial salmon and salmon roe sales by statistical area, 1987. a,b

Statistical Area	Summer Season c			Fall Season d				Total			
	Chinook	Chum	Chum Roe e	Chinook	Chum	Chum Roe	Coho	Chinook	Chum	Chum Roe	Coho
334-11	14,656	34,852	0					14,656	34,852	0	0
12	12,056	51,350	0					12,056	51,350	0	0
13	8,703	22,794	0					8,703	22,794	0	0
14	3,533	15,109	0					3,533	15,109	0	0
15	6,780	21,646	0					6,780	21,646	0	0
16	3,250	7,786	0					3,250	7,786	0	0
17	18,573	45,911	0					18,573	45,911	0	0
18	9,092	23,450	0					9,092	23,450	0	0
Subtotal District 1	76,643	222,898	0	0	0	0	0	76,643	222,898	0	0
334-21	14,195	48,734	0					14,195	48,734	0	0
22	9,672	54,459	0					9,672	54,459	0	0
23	5,663	19,157	0					5,663	19,157	0	0
24	6,376	22,988	0					6,376	22,988	0	0
25	11,552	29,538	0					11,552	29,538	0	0
Subtotal District 2	47,458	174,876	0	0	0	0	0	47,458	174,876	0	0
334-31	1,698	3,418	0					1,698	3,418	0	0
32	341	83	0					341	83	0	0
Subtotal District 3	2,039	3,501	0	0	0	0	0	2,039	3,501	0	0
TOTAL LOWER YUKON	126,140	401,275	0	0	0	0	0	126,140	401,275	0	0
334-41	91	29,314	110,977					91	29,314	110,977	0
42	999	593	9,956					999	593	9,956	0
43	434	84	541					434	84	541	0
Subtotal District 4	1,524	29,991	121,474	0	0	0	0	1,524	29,991	121,474	0
334-51	0	0	0					0	0	0	0
52	1,183	362	44					1,183	362	44	0
53	1,356	0	0					1,356	0	0	0
54	566	0	0					566	0	0	0
Subtotal District 5	3,105	362	44	0	0	0	0	3,105	362	44	0
334-61	0	2,167	0					0	2,167	0	0
62	600	6,882	349					600	6,882	349	0
63	602	1,561	101					602	1,561	101	0
Subtotal District 6	1,202	10,610	450	0	0	0	0	1,202	10,610	450	0
TOTAL UPPER YUKON	5,831	40,963	121,968	0	0	0	0	5,831	40,963	121,968	0
GRAND TOTAL YUKON AREA	131,971	442,238	121,968	0	0	0	0	131,971	442,238	121,968	0

a Sales reported in numbers of fish sold in the round and pounds of unprocessed roe.
b Refer to Table 13 for estimates of total commercial harvest.

c Summer Season

District 1	6/15-7/10	District 4	6/21-7/28
District 2	6/17-7/09	District 5	6/26-7/20
District 3	6/21-7/02	District 6	7/03-8/16

d Fall Season

No Openings

e May include small amounts of chinook salmon roe.

Table 5. Yukon Area Commercial Fisheries Entry Commission salmon gear permits issued by residence, 1987.

District	Residence	Gillnet Permits	Fishwheel Permits
1, 2 and 3	Emmonak	103	
	Mountain Village	93	
	Alakanuk	82	
	Kotlik	73	
	St. Marys	64	
	Pilot Station	50	
	Marshall	45	
	Scammon Bay	41	
	Sheldon Point	21	
	Anchorage	18	
	Russian Mission	17	
	Bethel	15	
	Holy Cross	12	
	Fairbanks	10	
	Stebbins	7	
	Unalakleet	7	
	Shaktoolik	5	
	Wasilla	4	
	Pitkas Point	3	
	Chevak	2	
	Kenai	2	
	Kotzebue	2	
	Sitka	2	
	St. Michael	2	
	Dillingham	1	
	Douglas	1	
	Eagle River	1	
	Eek	1	
	Elim	1	
	Fort Yukon	1	
	Hooper Bay	1	
	Iliamna	1	
	Juneau	1	
	Manley Hot Springs	1	
	Napakiak	1	
	Nome	1	
	Palmer	1	
	Red Devil	1	
	Salcha	1	
	Seward	1	
	Tok	1	
	Bellingham, WA	1	
	Everett, WA	1	
	Gig Harbor, WA	1	
	Rock Hill, SC	1	
	Seattle, WA	1	
	Troy, MT	1	
Total Lower Yukon		703 a	
4,5 and 6	Anchor Pt.	0	1
	Anchorage	4	1
	Anvik	2	7
	Cantwell	0	1
	Circle	1	1
	Clear	1	0
	College	0	1
	Dillingham	0	1
	Fairbanks	17	18
	Ft. Yukon	0	1
	Galena	6	21
	Grayling	3	6
	Holy Cross	2	0
	Huslia	0	1
	Kaltag	3	13
	Kasilof	1	0
	Kodiak	1	0
	Koyukuk	0	3
	Manley	2	5
	McGrath	0	1
	Minto	0	1
	Nenana	6	17
	North Pole	2	2
	Nulato	1	19
	Rampart	2	2
	Ruby	2	10
	Salcha	0	1
	Soldotna	1	0
	Stevens Village	0	2
	Tanana	5	16
	Two Rivers	1	0
	Los Angeles, CA	1	0
Total Upper Yukon		64	152
Grand Total Yukon Area		767	152

a Does not include transfers.

Table 6. Commercial salmon catch and effort data by fishing period, set and drift gill nets combined, District 1, Yukon area, 1987. a

Period No.	Period Dates	Hours Fished	No. of Fishermen	Period Catch and Catch Per Unit Effort						Cumulative Catch and Catch Per Unit Effort					
				Chinook	CPUE	Coho	CPUE	Chum	CPUE	Chinook	CPUE	Coho	CPUE	Chum	CPUE
1	6/15-6/16	24	362	12,970	1.49	0	0.00	10,951	1.26	12,970	1.49	0	0.00	10,951	1.26
2	6/18-6/19	24	404	22,513	2.32	0	0.00	19,817	2.04	35,483	1.93	0	0.00	30,768	1.67
3	6/22-6/23	24	398	15,041	1.57	0	0.00	13,586	1.42	50,524	1.81	0	0.00	44,354	1.59
4	6/25-6/26	12	405	11,623	2.39	0	0.00	23,488	4.83	62,147	1.89	0	0.00	67,842	2.07
Subtotal b		84	432	62,147	1.89	0	0.00	67,842	2.07						
5	6/29-6/30	24	361	7,904	0.91	0	0.00	67,330	7.77	7,904	0.91	0	0.00	135,172	3.26
6	7/02-7/03	24	355	4,665	0.55	0	0.00	50,698	5.95	12,569	0.73	0	0.00	185,870	3.72
7	7/09-7/10	12	313	1,927	0.51	0	0.00	37,028	9.86	14,496	0.69	0	0.00	222,898	4.15
Subtotal c		144	440	14,496	0.69	0	0.00	222,898	4.15						
Season Total		144	440	76,643		0		222,898							

a Catches reported in numbers of fish sold in the round.

b Chinook salmon season (6/15 to 6/26), no mesh size restrictions.

c Summer chum salmon season (6/15 to 7/10). Six inch maximum mesh size restriction in effect after 6/26. Chinook salmon subtotal represents catch during restricted mesh size fishing periods.

Table 7. Commercial salmon catch and effort data by fishing period, set and drift gill nets combined, District 2, Yukon area, 1987. a

Period No.	Period Dates	Hours Fished	No. of Fishermen	Period Catch and Catch Per Unit Effort						Cumulative Catch and Catch Per Unit Effort					
				Chinook	CPUE	Coho	CPUE	Chum	CPUE	Chinook	CPUE	Coho	CPUE	Chum	CPUE
1	6/17-6/18	24	224	9,536	1.77	0	0.00	13,734	2.55	9,536	1.77	0	0.00	13,734	2.55
2	6/21-6/22	24	225	12,150	2.25	0	0.00	16,490	3.05	21,686	2.01	0	0.00	30,224	2.80
3	6/24-6/25	24	221	10,860	2.05	0	0.00	23,223	4.38	32,546	2.02	0	0.00	53,447	3.32
4	6/29	12	218	7,581	2.90	0	0.00	6,728	2.57	40,127	2.15	0	0.00	60,175	3.22
Subtotal b		84	233	40,127	2.15	0	0.00	60,175	3.22						
5	7/01-7/02	24	214	4,713	0.92	0	0.00	56,614	11.02	4,713	0.92	0	0.00	116,789	4.90
6	7/06	6	182	1,114	1.02	0	0.00	22,721	20.81	5,827	0.94	0	0.00	139,510	5.60
7	7/09	6	200	1,504	1.25	0	0.00	35,366	29.47	7,331	0.99	0	0.00	174,876	6.69
Subtotal c		120	239	7,331	0.99	0	0.00	174,876	6.69						
Season Total		120	239	47,458		0		174,876							

a Catches reported in numbers of fish sold in the round.

b Chinook salmon season (6/17 to 6/29), no mesh size restrictions.

c Summer chum salmon season (6/17 to 7/09). Six inch maximum mesh size restriction in effect after 6/29. Chinook salmon subtotal represents catch during restricted mesh size fishing periods.

Table 8. Commercial salmon catch and effort data by fishing period, set and drift gill nets combined, District 3, Yukon area, 1987. a

Period No.	Period Dates	Hours Fished	No. of Fishermen	Period Catch and Catch Per Unit Effort						Cumulative Catch and Catch Per Unit Effort					
				Chinook	CPUE	Coho	CPUE	Chum	CPUE	Chinook	CPUE	Coho	CPUE	Chum	CPUE
1	6/21-6/22	24	8	753	3.92	0	0.00	368	1.92	753	3.92	0	0.00	368	1.92
2	6/24-6/25	24	8	757	3.94	0	0.00	425	2.21	1,510	3.93	0	0.00	793	2.07
3	6/29	12	8	403	4.20	0	0.00	231	2.41	1,913	3.99	0	0.00	1,024	2.13
Subtotal b		60	10	1,913	3.99	0	0.00	1,024	2.13						
4	7/01-7/02	24	9	126	0.58	0	0.00	2,477	11.47	126	0.58	0	0.00	3,501	5.03
Subtotal c		84	13	126	0.58	0	0.00	3,501	5.03						
Season Total		84	13	2,039		0		3,501							

a Catches reported in numbers of fish sold in the round.

b Chinook salmon season (6/21 to 6/29), no mesh size restrictions.

c Summer chum salmon season (6/21 to 7/02). Six inch maximum mesh size restriction in effect after 6/29. Chinook salmon subtotal represents catch during restricted mesh size fishing periods.

Table 9. Commercial salmon and salmon roe sales and effort by fishing period, set gill nets and fishwheels combined, District 4, Yukon area, 1987. a

Period Dates	Hours Fished	No. of Fishermen	Chinook	Chum	Chum Roe b	Coho
6/21-6/23	48	23	0	631	1,469	0
6/24-6/26	48	46	13	3,860	7,364	0
6/28-6/30	48	71	134	5,585	17,664	0
7/01-7/03	48	80	228	6,643	23,683	0
7/05-7/07	48	81	331	5,771	23,729	0
7/12-7/14	48	82	558	4,116	26,348	0
7/19-7/21	48	62	167	3,353	16,761	0
7/26-7/28	48	55	93	32	4,456	0
Total c	384	87	1,524	29,991	121,474	0

a Sales reported in numbers of fish sold in the round and pounds of unprocessed roe.
b May include small amounts of chinook salmon roe.
c Chinook and summer chum salmon season 6/21 to 7/28.

Table 10. Commercial salmon and salmon roe sales and effort by fishing period, set gill nets and fishwheels combined, District 5, Yukon area, 1987. a

Period Dates	Hours Fished	No. of Fishermen	Chinook	Chum	Chum Roe b	Coho
6/26-6/28	48	7	127	7	20	0
6/30-7/02	48	17	596	37	0	0
7/03-7/05	48	21	738	123	1	0
7/07-7/09	48	21	808	195	23	0
7/10-7/11 c	24	15	431	0	0	0
7/12-7/18	168	3	314	0	0	0
7/19-7/20 d	48	3	91	0	0	0
Total	432	30	3,105	362	44	0

a Sales reported in numbers of fish sold in the round and pounds of unprocessed roe.
b May include small amounts of chinook salmon roe.
c Subdistricts 5-A, 5-B, and 5-C closed on 7/11.
d Subdistrict 5-D closed on 7/20.

Table 11. Commercial salmon and salmon roe sales and effort by fishing period, set gill nets and fishwheels combined, District 6, Yukon area, 1987. a

Period Dates	Hours Fished	No. of Fishermen	Chinook	Chum	Chum Roe b	Coho
7/03-7/05	48	3	15	0	0	0
7/06-7/08	48	8	185	68	0	0
7/10-7/12	48	9	195	462	0	0
7/13-7/15	48	8	102	547	119	0
7/17-7/19	48	9	198	1,053	11	0
7/20-7/21 c	24	13	451	2,099	135	0
8/11-8/12	24	18	15	3,324	10	0
8/14-8/16 d	48	14	41	3,057	175	0
Total	336	25	1,202	10,610	450	0

a Sales reported in numbers of fish sold in the round and pounds of unprocessed roe.
b May include small amounts of chinook salmon roe.
c Chinook salmon season 7/03 to 7/21.
d Summer chum salmon season 8/11 to 8/16.

Table 12. Commercial salmon and salmon roe sales by gear type and by statistical area, upper Yukon area, 1987. a,b

Statis. Area	Summer Season									Fall Season d								
	Chinook			Chum			Summer Chum Roe c			Fall Chum			Fall Chum Roe			Coho		
	GN	FW	Subtotal	GN	FW	Subtotal	GN	FW	Subtotal	GN	FW	Subtotal	GN	FW	Subtotal	GN	FW	Subtotal
334-41	55	36	91	2,696	26,618	29,314	8,607	102,370	110,977									
334-42	584	415	999	0	593	593	124	8,832	8,956									
334-43	120	314	434	0	84	84	0	541	541									
Subtotal Dist. 4	759	765	1,524	2,696	27,295	29,991	8,731	112,743	121,474	0	0	0	0	0	0	0	0	0
334-51	0	0	0	0	0	0	0	0	0									
334-52	693	490	1,183	44	318	362	24	20	44									
334-53	1,136	220	1,356	0	0	0	0	0	0									
334-54	388	178	566	0	0	0	0	0	0									
Subtotal Dist. 5	2,217	888	3,105	44	318	362	24	20	44	0	0	0	0	0	0	0	0	0
334-61	0	0	0	113	2,054	2,167	0	0	0									
334-62	21	579	600	605	6,277	6,882	0	349	349									
334-63	176	426	602	230	1,331	1,561	0	101	101									
Subtotal Dist. 6	197	1,005	1,202	948	9,662	10,610	0	450	450	0	0	0	0	0	0	0	0	0
Totals Upper Yukon	3,173	2,658	5,831	3,688	37,275	40,963	8,755	113,213	121,968	0	0	0	0	0	0	0	0	0

a Roe sales expressed in pounds of unprocessed product.
b Gear codes: GN - set gillnet; FW - fishwheel.
c May include small amounts of chinook salmon roe.
d No openings during fall season.

Table 13. Yukon River drainage total estimated commercial related salmon catch by district and country, 1987.

District	Chinook	Summer Chum				Fall Chum			Coho
		Round	Roe a	Other b	Total c	Round	Roe a	Total	
1	76,643	222,898	0	0	222,898	0	0	0	0
2	47,458	174,876	0	0	174,876	0	0	0	0
3	2,039	3,501	0	0	3,501	0	0	0	0
Total Lower Yukon	126,140	401,275	0	0	401,275	0	0	0	0
4	1,524	29,991	121,474	58,335 d	209,800 e	0	0	0	0
5	3,105	362	44	0	406	0	0	0	0
6	1,202	10,610	450	0	11,060	0	0	0	0
Total Upper Yukon	5,831	40,963	121,968	58,335	221,266	0	0	0	0
Total Alaskan	131,971	442,238	121,968	58,335	622,541	0	0	0	0
Total Canadian	10,704	0	0	0	0	40,341	0	40,341	0
Grand Total	142,675	442,238	121,968	58,335	622,541	40,341	0	40,341	0

a One female chum produces approximately one pound of roe.

b Other refers to estimated number of males taken incidentally during roe fishery which were not sold.

c Totals may not be the same as those in Table 15, since many females stripped of roe and incidental males are reported as subsistence catches.

d Calculated by dividing pounds of roe by average proportion of females captured at Stink Creek test fishery from 1981-1985 (.579), subtracted by pounds of roe and fish sold in the round (assumed to be all males).

e It is estimated that 100,480 of these fish were reported as subsistence.

Table 14. Yukon River drainage subsistence salmon catch data, 1987. a

Village	Survey Date	Fishing Families	Dogs	Chinook	Summer Chum	Fall Chum	Coho	Whitefish/ Sheefish	8" Nets	6" Nets	Fish Wheels
Sheldon's Pt.	8/25	18	45	1,173	2,460	882	308	311/48	9	21	0
Alakanuk	8/24	80	140	1,180	9,913	3,748	1,116	674/364	21	85	0
Emmonak	8/22-26	68	104	2,518	11,177	8,160	3,497	127/83	36	58	0
Kotlik	8/21	57	176	2,407	7,210	5,677	1,475	523/1,324	48	63	0
Y-1 Subtotal		223	465	7,278	30,760	18,467	6,396	1,635/1,819	114	227	0
Mt. Village	8/31	90	185	2,252	12,456	4,897	2,481	948/260	34	103	0
Pitkas Pt.	9/01	9	78	380	1,184	1,143	273	56/19	7	11	0
St. Marys	9/02	58	216	2,077	11,218	2,823	1,467	77/132	26	53	0
Pilot Station	9/04	45	154	2,593	4,279	583	300	1,019/164	41	44	0
Marshall	9/03	55	465	2,564	3,997	4,008	2,373	640/284	48	58	0
Y-2 Subtotal		257	1,098	9,866	33,134	13,454	6,894	2,740/859	156	269	0
Russian Mission	8/29	24	81	2,036	2,283	1,255	423	h /145	20	21	0
Holy Cross	9/02	35	78	2,625	1,878	1,598	259	603/57	32	19	0
Y-3 Subtotal		59	159	4,661	4,161	2,853	682	603/202	52	40	0
Lower Yukon Total b		539	1,722	21,805	68,055	34,774	13,972	4,978/2,880	322	536	0
Anvik	9/09	16	117	428	28,887	394	405	330/75	8	9	7
Shageluk c	9/10	17	98	47	8,015	434	72	1,413/272	3	19	0
Grayling	9/09	24	215	1,322	21,264	4,750	599	2,073/162	15	23	7
Kaltag	10/26	18	120	1,117	28,550	7,474	0	607/59	12	6	13
Nulato	10/27	28	130	1,573	16,299	2,200	85	1,229/126	20	11	18
Koyukuk	10/29	14	61	609	9,718	2,492	894	463/20	8	8	4
Galena	10/29	34	112	1,270	11,776	10,509	1,349	3,839/328	23	12	13
Ruby	10/30	17	188	927	8,786	11,000	0	1,328/122	6	4	10
Y-4 Subtotal		168	1,041	7,293	133,295 d	39,253	3,404	11,282/1,164	95	92	72
Tanana	11/09	38	511	4,021	10,876	41,825	6,680	11,091/1,620	31	12	24
Rampart	11/04	12	170	2,815	2,434	5,092	81	289/40	10	4	4
Fbks. F.C. e	Permit f,g	39	h	2,287	5,755	21,014	64	1,947/532	43	24	14
Stevens Village	11/04	20	90	2,076	1,446	7,538	0	188/50	15	8	6
Beaver	11/04	8	50	466	657	5,750	0	41/65	4	3	4
Ft. Yukon	10/21-23	30	281	3,950	1,187	15,200	41	918/215	23	6	16
Circle/Central i	11/04	16	71	1,614	2,078	7,691	0	109/25	11	6	7
Eagle j	11/10-11	44	276	2,020	417	19,678	0	66/5	30	34	3
Y-5 Subtotal		207	1,449	19,249	24,850	123,788	6,866	14,649/2,552	167	97	78
Main River Totals		914	4,212	48,347	226,200	197,815	24,242	30,909/6,596	584	725	150

Table 14. Yukon River drainage subsistence catch data, 1987 (Continued).

Village	Survey Date	Fishing Families	Dogs	Chinook	Summer Chum	Fall Chum	Coho	Whitefish/ Sheefish	8" Nets	6" Nets	Fish Wheels
Manley	11/06	8	124	40	267	4,267	1,467	301/1	3	3	5
Minto	11/05	22	196	374	1,383	5,419	671	1,275/139	4	11	6
Nenana	Mail	41	567	3,151	21,214	26,909	19,592	7,157/79	9	29	26
Fairbanks k,l,m	Permit	183	h	531	2,739	3,316	2,465	84/7	44	146	9
Y-6 Subtotal		254	887	4,096	25,603	39,911	24,195	8,817/226	60	189	46
Huslia	10/28	18	190	182	11,042	585	124	2,172/416	5	21	0
Hughes	10/28	13	37	177	4,369	586	0	1,625/245	3	13	0
Allakaket n	10/28	20	161	309	8,700	1,477	23	2,935/636	7	25	0
Koyukuk R. Subtotal		51	388	668	24,111	2,648	147	6,732/1,297	15	59	0
Venetie	10/22	8	58	13	0	2,774	17	1/2	0	10	0
Chalkyitsik	10/22	8	53	0	0	2,686	2	82/7	0	9	0
Subt Chandalar/Black R		16	111	13	0	5,460	19	83/9	0	19	0
Subtotal Upper Yukon (Alaska)		696	3,876	31,319	207,859	211,060	34,631	41,563/5,248	337	456	196
Totals Yukon River Drainage (Alaska)		1,235	5,598	53,124	275,914	245,834	48,603	46,541/8,128	659	992	196
Old Crow o		h	h	h	h	h	h	h	h	h	h
Yukon Territory o Totals		h	h	6,326	h	3,904	h	h	h	h	h
Grand Total Yukon River Drainage		1,235	5,598	59,450	275,914	249,738	48,603	46,541/8,128	659	992	196

a Catch data expanded.

b Does not include Hooper Bay and Scammon Bay harvest of 3,621 chinook, 29,668 summer chum, 222 fall chum and 133 coho salmon.

c Shageluk harvest data from households fishing in main-stem Yukon River and Innoko River.

d An estimated 24,800 of these fish were taken for subsistence purposes by either subsistence only fishermen or by commercial fishermen before or after the close of the commercial fishing season.

e Data from fishermen who fished between Hess Creek and Dall River.

f A total of 58 permits issued (16 subsistence and 42 personal use) 10 did not fish, two did not report catches. Catches by Stevens Village residents shown under Stevens Village.

g 42 personal use fishermen caught 1,674 chinook, 4,262 summer chum, 15,750 fall chum and 58 coho salmon.

h Data not available.

i Five subsistence permits issued.

j A total of 46 subsistence and 2 personal use permits were issued. Two personal use fishermen caught 32 chinook salmon. Tok catches (four fishermen) included with Eagle.

k Data from fishermen (Fairbanks, North Pole and Salcha combined) that fished on the Tanana River between the mouth of Wood River and the mouth of Salcha River.

l 289 permits issued (217 subsistence, 72 personal use and 60 both), 103 did not fish, 12 did not report catches.

m 132 personal use fishermen caught 3,316 fall chum and 2,465 coho salmon.

n Alatna combined with Allakaket.

o Data from Department of Fisheries & Oceans, Whitehorse, YT. Average harvest at Old Crow from 1984 through 1986 was 317 chinook, 2,733 fall chum and 350 coho salmon.

Table 15. Yukon River drainage total utilization of salmon by district and country, 1987.

District	Fishery	Chinook	Summer Chum	Fall Chum	Coho
1	Comm.	76,643	222,898	0	0
	Subs.	7,278	30,760	18,467	6,396
	Total	83,921	253,658	18,467	6,396
2	Comm.	47,458	174,876	0	0
	Subs.	9,866	33,134	13,454	6,894
	Total	57,324	208,010	13,454	6,894
3	Comm.	2,039	3,501	0	0
	Subs.	4,661	4,161	2,853	682
	Total	6,700	7,662	2,853	682
Total Lower Yukon	Comm.	126,140	401,275	0	0
	Subs.	21,805	68,055	34,774	13,972
	Total	147,945	469,330	34,774	13,972
4	Comm.	1,524	109,320 a	0	0
	Subs. b	7,961	157,406	41,901	3,551
	Total	9,485	266,726	41,901	3,551
5	Comm.	3,105	362 d	0	0
	Subs. c	19,262	24,850	129,248	6,885
	Total	22,367	25,212	129,248	6,885
6	Comm.	1,202	10,610 d	0	0
	Subs.	4,096	25,603	39,911	24,195
	Total	5,298	36,213	39,911	24,195
Total Upper Yukon	Comm.	5,831	120,292	0	0
	Subs.	31,319	207,859	211,060	34,631
	Total	37,150	328,151	211,060	34,631
Total Yukon Area (Alaska)	Comm.	131,971	521,567	0	0
	Subs.	53,124	275,914	245,834	48,603
	Total	185,095	797,481	245,834	48,603
Total Canada e	Comm.	10,704	0	40,341	0
	Subs. f	6,326	0	3,904	0
	Total	17,030	0	44,245	0
Grand Total	Comm.	142,675	521,567	40,341	0
	Subs.	59,450	275,914	249,738	48,603
	Total	202,125	797,481	290,079	48,603

a Total estimated commercial related harvest was 209,800 summer chum salmon (Table 13) of which an estimated 100,480 fish were reported as subsistence.
b Includes Innoko and Koyukuk River drainages.
c Includes Chandalar and Black River drainages.
d Harvest of females for commercial roe sales believed to be reported as subsistence.
e Data from Department of Fisheries and Oceans, Whitehorse, YT.
f Combined Indian Food and Domestic fisheries.

Table 16. Salmon spawning escapement estimates obtained by aerial surveys in the Yukon River drainage, 1987. a

Stream (drainage)	Date	Survey Rating	Chinook	Summer Chums	Fall Chums	Coho
Mountain Village Stream	7/21	Poor	7	149	--	--
Andreafsky River						
East Fork (Tower Count)	6/25-7/25		2,011	45,221	--	--
East Fork (Aerial)	7/27	Good	(1,608)	(6,687)	--	--
West Fork (Aerial)	7/26	Good	3,141	31,998	--	--
Allen Creek	7/26	Good	140	3537		
	Subtotal		5,292	80,756	--	--
Atchuelinguk River (Chulinak R)	7/26	Good	674	11,973	--	--
Yukon River (Pilot Station)						
Main River Sonar b,c	6/8-9/6		(116,851)	(687,934)	(586,586)	(241,497)
Anvik River						
Aerial Counts						
Mainstem River	7/23,7/30	Fair-Poor	1,042	(122,080)	--	--
Beaver Creek	7/23,7/30	Good	37	(14,840)	--	--
Canyon Creek	7/23	Poor	4	(1,320)	--	--
Otter Creek	7/23,7/30	Fair-Poor	74	(12,284)	--	--
Swift River	7/23,7/30	Fair-Poor	8	(6,735)	--	--
Yellow River	7/30	Poor	8	(153)	--	--
McDonald Creek	7/23	Poor	1	(450)		
Sonar Count d	6/21-7/26		--	455,876	--	--
	Subtotal		1,174	455,876	--	--
Nulato River						
Below Forks	7/26	Good	17	2,505	--	--
South Fork	7/26	Good	493	4,094	--	--
North Fork	7/26	Good	1,128	4,658	--	--
	Subtotal		1,638	11,257	--	--
Koyukuk River Drainage						
Gisasa River	7/27	Good	731	2,123	--	--
Dakli River	7/27	Fair	--	1,851	--	--
Wheeler Creek	7/27	Fair	1	1,641	--	--
	Subtotal		1	3,492	--	--
Hogatza River						
Caribou Creek	7/27	Too Late	--	2,944	--	--
Clear Creek	7/27	Too Late	--	2,725	--	--
	Subtotal		--	5,669	--	--
Henshaw Creek e	8/11		20	35	--	--
South Fork Koyukuk River	8/2	Fair-Poor	136	35	--	--
Jim River	8/2,8/14p	Poor	100	401	--	--
	Subtotal		236	436	--	--
Total Koyukuk River			988	11,755	--	--
Lower Tanana River Drainage						
Kantishna River Drainage						
Toklat River (lower mainstem)	10/6	Fair	--	--	2,220	--
Floodplain vic Rdhse f	10/21-22	Good	--	--	11,002	57
Geiger Creek g	10/22	Good	--	--	6,650	1,175
Sushana River g	10/20	Good	--	--	698	45
Population Estimate for upper Toklat area h			--	--	(22,141)	--
	Subtotal		--	--	20,570	1,277
Bearpaw River (mainstem)	10/6	Good	--	--	111	--
Moose Creek	10/6	Good	--	--	1,277	--
	Subtotal		--	--	1,388	--

Table 16. Salmon spawning escapement estimates obtained by aerial surveys in the Yukon River drainage, 1987 a (Continued).

Stream (drainage)	Date	Survey Rating	Chinook	Summer Chum	Fall Chum	Coho
Nenana River Drainage						
Seventeen Mile Slough	10/6	Good	--	--	1,270	3,802
Lost Slough	10/6	Good	--	--	--	2,511
Julius Creek						
Clear Creek Weir Counts i	7/12-8/2		165	75	--	--
Wood Creek Weir Counts i	9/23-10/28		--	--	1,528	2,450
	Subtotal		165	75	2,798	8,763
Chena River (Aerial)	8/4	Fair-Poor	1,312	333	--	--
Population Estimate j			(6,404)	--	--	--
	Subtotal		1,312	333	--	--
Salcha River (Aerial)	8/4,8/10	Fair,Good	1,898	3,657	--	--
Population Estimate j,k			(4,771)	--	--	--
	Subtotal		1,898	3,657	--	--
Total Lower Tanana River			3,375	4,065	24,756	10,040
Upper Tanana River Drainage						
Sl immediately dwnstr Delta R m	11/6	Poor	--	--	171	2
Delta River						
Aerial Survey	10/16	Poor	--	--	(3,200)	--
Foot Survey	11/6	Good	--	--	20,464	5
Population Estimate h			--	--	(21,180)	--
Bluff Cabin Slough g	10/28	Fair	--	--	9,395	--
Bluff Cabin Spring	10/16	Poor	--	--	--	25
Clearwater Lake Outlet Slough	10/16	Poor	--	--	1,500	--
Clearwater Lake Outlet n,k	10/26	Good	--	--	--	4,225
Delta Clearwater River n,k	10/26	Good	--	--	2,500	22,300
Tanana Slough adj to Onemile Sl g	10/8	Good	--	--	250	39
Billy Creek Slough	10/16	Good	--	--	50	--
Total Upper Tanana River			0	0	34,330	26,596
Total Tanana River			3,375	4,065	59,086	36,636
Beaver Creek n,o	7/27	Good	1	--	--	--
Chandalar River (Aerial) e	8/5		30	--	--	--
Sonar Estimate d,e	8/10-9/25		--	--	52,416	--
Porcupine River Drainage						
Black River Drainage e,p	8/26-30		--	--	6	--
Kevinjik Creek e,p	9/15		--	--	1	--
	Subtotal		--	--	7	--
Sheenjek River (Aerial)	9/15	Poor	--	--	(10,706)	--
Sonar Estimate d	8/25-9/24		--	--	140,086	--
	Subtotal		--	--	140,086	--
Fishing Branch River (weir) q			--	--	48,956	--
Total Porcupine River			--	--	189,049	--
Charley River e,n	8/11		1	--	--	--
Total Alaskan Portion of Drainage			13,180	575,831	251,595 t	36,636
Yukon Territory Streams						
Fortymile River e,n	8/17-22		2	--	--	--
Klondike River q	8/5		35	--	--	--
North Klondike River q	8/5		39	--	--	--
	Subtotal		74	--	--	--

Table 16. Salmon spawning escapement estimates obtained by aerial surveys in the Yukon River drainage, 1987 a (Continued).

Stream (drainage)	Date	Survey Rating	Chinook	Summer Chums	Fall Chums	Coho
White River q	10/21		--	--	0	--
Donjek River q	10/21		--	--	0	--
Kluane River q	10/21		--	--	12,000	--
Tincup Creek q	8/20	Incomplete	100	--	--	--
Koidern River q	10/21		--	--	50	--
	Subtotal		100	--	12,050	--
Stewart River						
North McQuesten River q	8/18	Good	2	--	--	--
Pelly River						
Blind Creek n,q	8/19	Poor	1	--	--	--
Ross River	8/21	Poor	134	--	--	--
Lewis Lake Outlet	8/21	Poor	46	--	--	--
Hoole River	8/23	Fair	90	--	--	--
	Subtotal		271	--	--	--
Tatchun Creek g,q	8/27	Good	159	--	--	--
Nordenskiold River n	8/23	Good	43	--	--	--
Little Salmon River						
ADF&G Aerial Survey	8/21	Good	(456)	--	--	--
DFO Aerial Survey	8/25	Good	468	--	--	--
Big Salmon River						
Big Salmon Lake to Scurvy Cr	8/23	Good	(379)	--	--	--
Scurvy Cr to Moose Cr	8/23	Good	(130)	--	--	--
Moose Cr to DFO weir	8/23	Good	(238)	--	--	--
DFO weir count	7/29-9/2		998	--	--	--
DFO weir to Bat Cr	8/23	Good	57	--	--	--
Bat Cr to Souch Cr	8/23	Good	87	--	--	--
Souch Cr to South Big Salmon	8/22	Fair	230	--	--	--
	Subtotal		1,372	--	--	--
Teslin River Drainage						
Mainstem (below Teslin Lk) q			--	--	--	--
Mainstem (Above Teslin Lk)	8/24	Poor	19	--	--	--
Nisutlin River	8/22-23	Good-Fair	275	--	--	--
Wolf River	8/24	Good-Fair	71	--	--	--
Swift River	8/24	Good-Fair	74	--	--	--
Morley River	8/24	Fair-Poor	83	--	--	--
Jennings River	8/24	Poor	16	--	--	--
	Subtotal		538	--	--	--
Takhihi River q	8/28	Fair	202	--	--	--
Whitehorse Fishway Counts q,r	7/29-8/30		327	--	--	--
Mainstem Yukon River						
Tatchun Creek to Minto q	10/26		--	--	728	--
Minto to Ft Selkirk q	10/26		--	--	5,387	--
Spawning Population Estimates j,q,s			(13,493)	--	(80,879)	--
	Subtotal		--	--	6,115	--
Total Yukon Territory			3,558	--	67,121 t	--
Yukon River Drainage Totals			16,738	575,831	318,716	36,636

a Only peak estimates listed; carcass counts included. Data in parentheses not included in totals or subtotals.
b Biosonics sonar estimate.
c Preliminary.
d Bendix side scan sonar estimate.
e U.S. Fish and Wildlife Service estimate.
f Combined foot and aerial estimate.
g Foot survey.
h Population estimate based upon replicate foot surveys and streamlife data.
i F.R.E.D. Division estimate.
j Spawning population estimate based upon mark and recapture study.
k Sport Fish Division estimate.
m Habitat Division estimate.
n Boat survey.
o Bureau of Land Management (BLM) estimate.
p Test fishing and radio telemetry.
q Canadian Department of Fisheries and Oceans (DFO) estimate.
r Includes approximately 100 taken for hatchery brood stock.
s Canadian estimates for Yukon Territory streams excluding the Fishing Branch River.
t Total for Alaskan portion of drainage does not include Fishing Branch River. Total for Yukon Territory includes Fishing Branch River.

Table 17. Yukon River (Alaska) salmon escapement objectives for selected species and streams.

Stream	Escapement Objective a				Escapement Objective a				Escapement Objective a	
	Species	Minimum	Optimum	Species	Minimum	Optimum	Species		Minimum	Optimum
Andreafsky River										
East Fork	Chinook	1,100	1,600	Summer Chum	76,000	109,000	--			
West Fork	Chinook	700	1,000	Summer Chum	62,000	116,000	--			
Anvik River										
Mainstem										
Yellow River to McDonald Cr	Chinook	300	500	--			--			
Goblet Cr to McDonald Cr	--			Summer Chum	209,000	356,000	--			
Sonar b	--			Summer Chum		487,000 b	--			
Nulato River										
North Fork	Chinook		500	Summer Chum	37,000	53,000	--			
South Fork	Chinook		500	--			--			
Hogatza River										
Clear Creek	--			Summer Chum	5,000	8,000	--			
Caribou Creek	--			Summer Chum	5,000	9,000	--			
Gisasa River	Chinook		650	--			--			
Chena River										
Mainstem from Flood Control Dam to Middle Fork	Chinook	1,000	1,700	--			--			
Salcha River	Chinook	1,500	3,500	Summer Chum	3,500		--			
Sheenjek River	--			--			Fall Chum		62,000 c	
Toklat River	--			--			Fall Chum		33,000 c	
Delta River	--			--			Fall Chum		11,000 c	

a Escapement objectives in numbers of fish are preliminary and are subject to change as additional data becomes available. Unless otherwise indicated, escapement objectives are based on aerial survey index estimates which do not represent total escapement, but do reflect annual spawner abundance trends when using standard survey methods under acceptable survey conditions.

b Optimum number calculated from escapement-return relationships.

c Total season escapement objective (expanded from inseason point estimates).

Table 18. Commercial herring catch and effort data by fishing period, Cape Romanzof District, 1987.

Date	Hours Fished	No. of Fishermen	Daily Catch			
			Bait	Sac Roe	Total	Roe %
23-May	3	133	0.0	558.7	558.7	8.63
26-May	3	125	0.0	401.2	401.2	9.43
27-May	2	145	21.0	360.7	381.7	8.82
Total	8	157	21.0	1320.6	1341.6	8.92

Appendix Table 1. Alaskan and Canadian total utilization of Yukon River salmon, 1903-1987. a

	Alaska			Canada			Total		
Year	Chinook	Other Salmon	Total	Chinook	Other Salmon	Total	Chinook	Other Salmon	Total
1903						4,666			4,666
1904									
1905									
1906									
1907									
1908						7,000			7,000
1909						9,238			9,238
1910									
1911									
1912									
1913						12,133			12,133
1914						12,573			12,573
1915						10,466			10,466
1916						9,566			9,566
1917									
1918	12,239	1,500,065	1,512,304			7,066	12,239	1,500,065	1,519,370
1919	104,822	738,790	843,612			1,800	104,822	738,790	845,412
1920	78,467	1,015,655	1,094,122			12,000	78,467	1,015,655	1,106,122
1921	69,646	112,098	181,744			10,840	69,646	112,098	192,584
1922	31,825	330,000	361,825			2,420	31,825	330,000	364,245
1923	30,893	435,000	465,893			1,833	30,893	435,000	467,726
1924	27,375	1,130,000	1,157,375			4,560	27,375	1,130,000	1,161,935
1925	15,000	259,000	274,000			3,900	15,000	259,000	277,900
1926	20,500	555,000	575,500			4,373	20,500	555,000	579,873
1927		520,000	520,000			5,366		520,000	525,366
1928		670,000	670,000			5,733		670,000	675,733
1929		537,000	537,000			5,226		537,000	542,226
1930		633,000	633,000			3,660		633,000	636,660
1931	26,693	565,000	591,693			3,473	26,693	565,000	595,166
1932	27,899	1,092,000	1,119,899			4,200	27,899	1,092,000	1,124,099
1933	28,779	603,000	631,779			3,333	28,779	603,000	635,112
1934	23,365	474,000	497,365			2,000	23,365	474,000	499,365
1935	27,665	537,000	564,665			3,466	27,665	537,000	568,131
1936	43,713	560,000	603,713			3,400	43,713	560,000	607,113
1937	12,154	346,000	358,154			3,746	12,154	346,000	361,900
1938	32,971	340,450	373,421			860	32,971	340,450	374,281
1939	28,037	327,650	355,687			720	28,037	327,650	356,407
1940	32,453	1,029,000	1,061,453			1,153	32,453	1,029,000	1,062,606
1941	47,608	438,000	485,608			2,806	47,608	438,000	488,414
1942	22,487	197,000	219,487			713	22,487	197,000	220,200
1943	27,650	200,000	227,650			609	27,650	200,000	228,259
1944	14,232		14,232			986	14,232		15,218
1945	19,727		19,727			1,333	19,727		21,060
1946	22,782		22,782			353	22,782		23,135
1947	54,026		54,026			120	54,026		54,146
1948	33,842		33,842				33,842		33,842
1949	36,379		36,379				36,379		36,379
1950	41,808		41,808				41,808		41,808
1951	56,278		56,278				56,278		56,278
1952	38,637	10,868	49,505				38,637	10,868	49,505
1953	58,859	385,977	444,836				58,859	385,977	444,836
1954	64,545	14,375	78,920				64,545	14,375	78,920
1955	55,925		55,925				55,925		55,925
1956	62,208	10,743	72,951				62,208	10,743	72,951
1957	63,623		63,623				63,623		63,623
1958	75,625	337,500	413,125	11,000	1,500	12,500	86,625	339,000	425,625
1959	78,370		78,370	8,434	3,098	11,532	86,804	3,098	89,902
1960	67,597		67,597	9,653	15,608	25,261	77,250	15,608	92,858
1961	141,152	452,521	593,673	13,246	9,076	22,322	154,398	461,597	615,995
1962	105,844	425,277	531,121	13,937	9,436	23,373	119,781	434,713	554,494
1963	141,910	401,700	543,610	10,077	27,696	37,773	151,987	429,396	581,383
1964	109,818	492,233	602,051	7,408	12,187	19,595	117,226	504,420	621,646
1965	134,706	472,798	607,504	5,380	11,789	17,169	140,086	484,587	624,673
1966	104,887	296,310	401,197	4,452	13,192	17,644	109,339	309,502	418,841
1967	146,104	335,436	481,540	5,150	16,961	22,111	151,254	352,397	503,651
1968	118,632	259,185	377,817	5,042	11,633	16,675	123,674	270,818	394,492
1969	105,027	416,623	521,650	2,624	7,776	10,400	107,651	424,399	532,050
1970	93,019	582,049	675,068	4,663	3,711	8,374	97,682	585,760	683,442
1971	136,191	530,537	666,728	6,447	16,911	23,358	142,638	547,448	690,086
1972	113,098	454,085	567,183	5,729	7,532	13,261	118,827	461,617	580,444
1973	99,670	769,023	868,693	4,522	10,135	14,657	104,192	779,158	883,350
1974	118,053	1,218,032	1,336,085	5,631	11,646	17,277	123,684	1,229,678	1,353,362
1975	76,883	1,286,437	1,363,320	6,000	20,600	26,600	82,883	1,307,037	1,389,920
1976	105,582	1,021,708	1,127,290	5,025	5,200	10,225	110,607	1,026,908	1,137,515
1977	114,338	1,090,330	1,204,668	7,527	12,479	20,006	121,865	1,102,809	1,224,674
1978	129,465	1,650,942	1,780,407	5,881	9,566	15,447	135,346	1,660,508	1,795,854
1979	158,678	1,654,445	1,813,123	10,375	22,084	32,459	169,053	1,676,529	1,845,582
1980	196,709	1,840,123	2,036,832	22,546	22,218	44,764	219,255	1,862,341	2,081,596
1981	187,708	2,115,459	2,303,167	17,809	22,281	40,090	205,517	2,137,740	2,343,257
1982	151,802	1,306,171	1,457,973	16,908	16,091	32,999	168,710	1,322,262	1,490,972
1983	197,388	1,673,071	1,870,459	18,652	29,490	48,142	216,040	1,702,561	1,918,601
1984	162,232	1,502,911	1,665,143	16,495	29,267	45,762	178,727	1,532,178	1,710,905
1985	185,959	1,597,127	1,783,086	19,001	41,515	60,516	204,960	1,638,642	1,843,602
1986	145,252	1,669,826	1,815,078	20,064	14,836	34,900	165,316	1,684,662	1,849,978
1987	185,095	1,134,557	1,319,652	17,030	44,245	61,275	202,125	1,178,802	1,380,927

a Commercial and subsistence harvest combined in numbers of fish, including "equivalent fish" converted from roe sales. See ADF&G 1985 Yukon Area Annual Management Report for data sources and methods of catch estimation used for some years.

Appendix Table 2. Commercial chinook salmon sales by district and country, Yukon River drainage, 1961-1987. a

	Lower Yukon Area				Upper Yukon Area						
Year	Dist. 1	Dist. 2	Dist. 3	Subtotal	Dist. 4	Dist. 5	Dist. 6	Subtotal	Alaska Total	Canada Total	Grand Total
1961	84,466	29,026	4,368	117,860	-	-	-	1,804	119,664	3,446	123,110
1962	67,099	22,224	4,687	94,010	-	-	-	724	94,734	4,037	98,771
1963	85,004	24,221	7,020	116,245	-	-	-	803	117,048	2,283	119,331
1964	67,555	20,246	4,705	92,506	-	-	-	1,081	93,587	3,208	96,795
1965	89,268	23,763	3,204	116,235	-	-	-	1,863	118,098	2,265	120,363
1966	70,788	16,927	3,612	91,327	-	-	-	1,988	93,315	1,942	95,257
1967	104,350	20,239	3,618	128,207	-	-	-	1,449	129,656	2,187	131,843
1968	79,465	21,392	4,543	105,400	-	-	-	1,126	106,526	2,212	108,738
1969	71,688	14,756	3,595	90,039	-	-	-	988	91,027	1,640	92,667
1970	56,648	17,141	3,705	77,494	-	-	-	1,651	79,145	2,611	81,756
1971	86,042	19,226	3,490	108,758	-	-	-	1,749	110,507	3,178	113,685
1972	70,052	17,855	3,841	91,748	-	-	-	1,092	92,840	1,769	94,609
1973	56,981	13,859	3,204	74,044	-	-	-	1,309	75,353	2,199	77,552
1974	71,840	17,948	3,480	93,268	685	2,663	1,473	4,821	98,089	1,808	99,897
1975	44,585	11,315	4,177	60,077	389	2,872	500	3,761	63,838	3,000	66,838
1976	62,410	16,556	4,148	83,114	409	3,151	1,102	4,662	87,776	3,500	91,276
1977	69,915	16,722	3,965	90,602	985	4,162	1,008	6,155	96,757	4,720	101,477
1978	59,006	32,924	2,916	94,846	608	3,079	635	4,322	99,168	2,975	102,143
1979	75,007	41,498	5,018	121,523	1,989	3,389	772	6,150	127,673	6,175	133,848
1980	90,382	50,004	5,240	145,626	1,521	4,891	1,947	8,359	153,985	9,500	163,485
1981	99,506	45,781	4,023	149,310	1,347	6,374	987	8,708	158,018	8,593	166,611
1982	74,450	39,132	2,609	116,191	1,087	5,385	981	7,453	123,644	8,640	132,284
1983	95,457	43,229	4,106	142,792	601	3,606	911	5,118	147,910	13,027	160,937
1984	74,671	36,697	3,039	114,407	961	3,669	867	5,497	119,904	9,885	129,789
1985	90,011	48,365	2,588	140,964	664	3,418	1,142	5,224	146,188	12,573	158,761
1986	53,035	41,849	901	95,785	502	2,733	950	4,185	99,970	10,797	110,767
1987	76,643	47,458	2,039	126,140	1,524	3,105	1,202	5,831	131,971	10,704	142,675
5 Yr Ave 1977-81	78,763	37,386	4,232	120,381	1,290	4,379	1,070	6,739	127,120	6,393	133,513
5 Yr Ave 1982-86	77,525	41,854	2,649	122,028	763	3,762	970	5,495	127,523	10,984	138,508

a Sales reported in numbers of fish sold in the round.

Appendix Table 3. Commercial summer chum salmon sales by district, Yukon River drainage, 1961-1987. a

	Lower Yukon Area				Upper Yukon Area								Alaska Total	
					Dist. 4		Dist. 5		Dist. 6		Subtotal			
Year	Dist. 1	Dist. 2	Dist. 3	Subtotal	Numbers	Roe b	Numbers	Roe b	Numbers	Roe b	Numbers	Roe b	Numbers	
1961	-	-	-	0	-	-	-	-	-	-	0	0	0	
1962	-	-	-	0	-	-	-	-	-	-	0	0	0	
1963	-	-	-	0	-	-	-	-	-	-	0	0	0	
1964	-	-	-	0	-	-	-	-	-	-	0	0	0	
1965	-	-	-	0	-	-	-	-	-	-	0	0	0	
1966	-	-	-	0	-	-	-	-	-	-	0	0	0	
1967	9,453	1,425	57	10,935	-	-	-	-	-	-	0	0	10,935	
1968	12,995	1,407	68	14,470	-	-	-	-	-	-	0	0	14,470	
1969	56,886	5,080	-	61,966	-	-	-	-	-	-	0	0	61,966	
1970	117,357	19,649	-	137,006	-	-	-	-	-	-	0	0	137,006	
1971	93,928	6,112	50	100,090	-	-	-	-	-	-	0	0	100,090	
1972	114,234	20,907	527	135,668	-	-	-	-	-	-	0	0	135,668	
1973	221,644	63,402	463	285,509	-	-	-	-	-	-	0	0	285,509	
1974	466,004	74,152	1,721	541,877	27,866	-	6,831	-	13,318	-	48,015	0	589,892	
1975	418,323	99,139	-	517,462	165,054	-	12,997	-	14,782	-	192,833	0	710,295	
1976	273,204	99,190	9,802	382,196	211,307	-	774	-	6,617	-	218,698	0	600,894	
1977	250,652	105,679	3,412	359,743	169,541	-	1,274	-	4,317	-	175,132	0	534,875	
1978	393,785	227,548	27,003	648,336	364,184	16,920	4,892	605	34,814	8,236	403,890	25,761	1,052,226	
1979	369,934	172,838	40,015	582,787	169,430	35,317	8,608	1,009	18,491	3,891	196,529	40,217	779,316	
1980	391,252	308,704	44,782	744,738	147,560	135,824	456	-	35,855	3,282	183,871	139,106	928,609	
1981	507,158	351,878	54,471	913,507	59,718	187,032	1,236	49	32,477	1,987	93,431	189,068	1,006,938	
1982	249,516	182,344	4,086	435,946	3,647	151,281	213	21	21,597	1,517	25,457	152,819	461,403	
1983	451,164	248,092	14,600	713,856	6,672	148,125	42	1,856	24,309	18	31,023	149,999	744,879	
1984	292,676	236,931	1,087	530,694	1,009	166,842	645	47	56,249	335	57,903	167,224	588,597	
1985	247,486	188,099	1,792	437,377	12,007	247,085	700	-	66,913	1,540	79,620	248,625	516,997	
1986	381,127	288,427	442	669,996	300	269,545	690	-	50,483	2,146	51,473	271,691	721,469	
1987	222,898	174,876	3,501	401,275	29,991	121,474	362	44	10,610	450	40,963	121,968	442,238	
5 Yr Ave 1977-81	382,556	233,329	33,937	649,822	182,087	75,019	3,293	333	25,191	3,479	210,571	78,830	860,393	
5 Yr Ave 1982-86	324,394	228,779	4,401	557,574	4,727	196,576	458	385	43,910	1,111	49,095	198,072	606,669	

a Sales reported in numbers of fish sold in the round and pounds of unprocessed roe.
b May include small amounts of chinook salmon roe.

Appendix Table 4. Commercial fall chum salmon sales by district and country, Yukon River drainage, 1961-1987. a

	Lower Yukon Area				Upper Yukon Area										
					Dist. 4		Dist. 5		Dist. 6		Subtotal	Alaska Total		Canada	Grand
Year	Dist. 1	Dist. 2	Dist. 3	Subtotal	Numbers	Roe b	Numbers	Roe b	Numbers	Roe b	Numbers	Roe b	Numbers	Total	Total
1961	42,461	-	-	42,461	-	-	-	-	-	-	0	0	42,461	3,276	45,737
1962	53,116	-	-	53,116	-	-	-	-	-	-	0	0	53,116	936	54,052
1963	-	-	-	0	-	-	-	-	-	-	0	0	0	2,196	2,196
1964	8,347	-	-	8,347	-	-	-	-	-	-	0	0	8,347	1,929	10,276
1965	22,936	-	-	22,936	-	-	-	-	-	-	381	0	23,317	2,071	25,388
1966	69,836	-	1,209	71,045	-	-	-	-	-	-	0	0	71,045	3,157	74,202
1967	36,451	-	1,823	38,274	-	-	-	-	-	-	0	0	38,274	3,343	41,617
1968	49,857	-	3,068	52,925	-	-	-	-	-	-	0	0	52,925	453	53,378
1969	128,866	-	1,722	130,588	-	-	-	-	-	-	722	0	131,310	2,279	133,589
1970	200,306	4,858	3,285	208,449	-	-	-	-	-	-	1,146	0	209,595	2,479	212,074
1971	188,533	-	-	188,533	-	-	-	-	-	-	1,061	0	189,594	1,761	191,355
1972	136,711	12,898	1,313	150,922	-	-	-	-	-	-	1,254	0	152,176	2,532	154,708
1973	173,783	45,304	-	219,087	-	-	-	-	-	-	13,003	0	232,090	2,806	234,896
1974	176,036	53,540	552	230,128	9,213	-	23,551	-	26,884	-	59,648	0	289,776	2,544	292,320
1975	158,183	51,666	5,590	215,439	13,666	-	27,212	-	18,692	-	59,570	0	275,009	2,500	277,509
1976	105,851	21,212	4,250	131,313	1,742	-	5,387	-	17,948	-	25,077	0	156,390	1,000	157,390
1977	131,758	51,994	15,851	199,603	13,980	-	25,730	-	18,673	-	58,383	0	257,986	3,990	261,976
1978	127,947	51,646	11,527	191,120	10,988	1,721	21,016	5,220	13,259	3,687	45,263	10,628	236,383	3,356	239,739
1979	109,406	94,042	25,955	229,403	48,899	3,199	47,459	8,097	34,185	7,170	130,543	18,466	359,946	9,084	369,030
1980	106,829	83,881	13,519	204,229	27,978	4,347	41,771	605	19,452	68	89,201	5,020	293,430	9,000	302,430
1981	167,834	154,883	19,043	341,760	12,082	1,311	86,620	6,955	25,989	3,019	124,691	11,285	466,451	15,260	481,711
1982	97,484	96,581	5,815	199,880	3,894	167	13,593	42	6,820	596	24,307	805	224,187	11,312	235,499
1983	124,371	85,645	10,018	220,034	4,482	1,963	43,993	0	34,089	3,101	82,564	5,064	302,598	25,990	328,588
1984	78,751	70,803	6,429	155,983	7,625	2,215	24,060	57	20,564	56	52,249	2,328	208,232	22,932	231,164
1985	129,948	40,490	5,164	175,602	24,452	2,525	25,338	0	42,352	0	92,142	2,525	267,744	35,746	303,490
1986	59,352	51,307	2,793	113,452	2,045	0	22,053	395	1,892	182	25,990	577	139,442	11,464	150,906
1987	0	0	0	0	0	0	0	0	0	0	0	0	0	40,341	40,341
5 Yr Ave 1977-81	128,755	87,289	17,179	233,223	22,785	2,116	44,519	4,175	22,312	2,789	89,616	9,080	322,839	8,138	330,977
5 Yr Ave 1982-86	97,981	68,965	6,044	172,990	8,500	1,374	25,807	99	21,143	787	55,450	2,260	228,441	21,489	249,929

a Sales reported in numbers of fish sold in the round and pounds of unprocessed roe.
b May include small amounts of coho salmon roe.

Appendix Table 5. Commercial coho salmon sales by district, Yukon River drainage, 1961-1987. a

Year	Lower Yukon Area				Upper Yukon Area				Alaska Total
	Dist.1	Dist.2	Dist.3	Subtotal	Dist.4	Dist.5	Dist.6	Subtotal	
1961	2,855	-	-	2,855	-	-	-	0	2,855
1962	22,926	-	-	22,926	-	-	-	0	22,926
1963	5,572	-	-	5,572	-	-	-	0	5,572
1964	2,446	-	-	2,446	-	-	-	0	2,446
1965	350	-	-	350	-	-	-	0	350
1966	19,254	-	-	19,254	-	-	-	0	19,254
1967	9,925	-	1,122	11,047	-	-	-	0	11,047
1968	13,153	-	150	13,303	-	-	-	0	13,303
1969	13,989	-	1,009	14,998	-	-	-	95	15,093
1970	12,632	-	-	12,632	-	-	-	556	13,188
1971	12,165	-	-	12,165	-	-	-	38	12,203
1972	21,705	506	-	22,211	-	-	-	22	22,233
1973	34,860	1,781	-	36,641	-	-	-	0	36,641
1974	13,713	176	-	13,889	-	1,409	1,479	2,888	16,777
1975	2,288	200	-	2,488	-	5	53	58	2,546
1976	4,064	17	-	4,081	-	-	1,103	1,103	5,184
1977	31,720	5,319	538	37,577	-	2	1,284	1,286	38,863
1978	16,460	5,835	758	23,053	32	1	3,066	3,099	26,152
1979	11,369	2,850	-	14,219	155	-	2,791	2,946	17,165
1980	4,829	2,660	-	7,489	30	-	1,226	1,256	8,745
1981	13,129	7,848	419	21,396	-	-	2,284	2,284	23,680
1982	15,115	14,179	87	29,381	15	-	7,780	7,795	37,176
1983	4,595	2,557	-	7,152	-	-	6,168	6,168	13,320
1984	29,472	43,064	621	73,157	1,095	-	7,688	8,783	81,940
1985	27,676	17,125	171	44,972	938	-	11,762	12,700	57,672
1986	24,824	21,197	793	46,814	-	-	441	441	47,255
1987	0	0	0	0	0	0	0	0	0
5 Yr Ave 1977-81	15,501	4,902	343	20,747	43	1	2,130	2,174	22,921
5 Yr Ave 1982-86	20,336	19,624	334	40,295	410	0	6,768	7,177	47,473

a Sales reported in numbers of fish sold in the round.

Appendix Table 6. Yukon River drainage total estimated commercial related summer chum salmon catch by area and district, 1961-1987.

		Upper Yukon Area											
	Lower Yukon Area	District 4				District 5			District 6				Alaska
Year	Total	Numbers	Roe a	Other b	Subtotal c	Numbers	Roe a	Subtotal d	Numbers	Roe a	Subtotal d	Total c	Total c
1961	0	-	-	-	0	-	-	0	-	-	0	0	0
1962	0	-	-	-	0	-	-	0	-	-	0	0	0
1963	0	-	-	-	0	-	-	0	-	-	0	0	0
1964	0	-	-	-	0	-	-	0	-	-	0	0	0
1965	0	-	-	-	0	-	-	0	-	-	0	0	0
1966	0	-	-	-	0	-	-	0	-	-	0	0	0
1967	10,935	-	-	-	0	-	-	0	-	-	0	0	10,935
1968	14,470	-	-	-	0	-	-	0	-	-	0	0	14,470
1969	61,966	-	-	-	0	-	-	0	-	-	0	0	61,966
1970	137,006	-	-	-	0	-	-	0	-	-	0	0	137,006
1971	100,090	-	-	-	0	-	-	0	-	-	0	0	100,090
1972	135,668	-	-	-	0	-	-	0	-	-	0	0	135,668
1973	285,509	-	-	-	0	-	-	0	-	-	0	0	285,509
1974	541,877	27,866	-	-	27,866	6,831	-	6,831	13,318	-	13,318	48,015	589,892
1975	517,462	165,054	-	-	165,054	12,997	-	12,997	14,782	-	14,782	192,833	710,295
1976	382,196	211,307	-	-	211,307	774	-	774	6,617	-	6,617	218,698	600,894
1977	359,743	169,541	-	-	169,541	1,274	-	1,274	4,317	-	4,317	175,132	534,875
1978	648,336	364,184	16,920	0	381,104	4,892	605	5,497	34,814	8,236	43,050	429,651	1,077,987
1979	582,787	169,430	35,317	0	204,747	8,608	1,009	9,617	18,491	3,891	22,382	236,746	819,533
1980	744,738	147,560	135,824	98,760 e	382,144	456	-	456	35,855	3,282	39,137	421,737	1,166,475
1981	913,507	59,718 f	187,032	83,695 g	330,445	1,236	49	1,285	32,477	1,987	34,464	366,194	1,279,701
1982	435,946	3,647 f	151,281	102,791 g	257,719	213	21	234	21,597	1,517	23,114	281,067	717,013
1983	713,856	6,672 f	148,125	100,591 g	255,388	42	1,856	1,898	24,309	18	24,327	281,613	995,469
1984	530,694	1,009 f	166,842	110,219 g	278,070	645	47	692	56,249	335	56,584	335,346	866,040
1985	437,377	12,007 f	247,085	168,391 g	427,483	700	-	700	66,913	1,540	68,453	496,636	934,013
1986	669,996	300 f	269,545	195,690 g	465,535	690	-	690	50,483	2,146	52,629	518,854	1,188,850
1987	401,275	29,991 f	121,474	58,335 g	209,800	362	44	406	10,610	450	11,060	221,266	622,541
5 Yr Ave													
1982-86	557,574	4,727	196,576	135,536	336,839	458	385	843	43,910	1,111	45,021	382,703	940,277

a One female chum salmon produces approximately one pound of roe.
b Other refers to estimated number of males taken incidentally during roe fishery which were not sold.
c Subtotals may not be the same as those in Appendix Table 29, since many females stripped of roe and incidental males are reported as subsistence catches.
d Subtotals may not be the same as those in Appendix Table 29, since females stripped of roe and incidental males are believed to be reported as subsistence catches.
e Calculated by dividing pounds of roe by proportion of females captured at Stink Creek test fishery, subtracted by pounds of roe. Some of these males may have been sold in the round.
f Assume all fish sold in the round were males.
g Calculated by dividing pounds of roe by proportion of females captured at Stink Creek test fishery, subtracted by pounds of roe and fish sold in the round.

Appendix Table 7. Commercial Fisheries Entry Commission (CFEC) salmon permits issued by gear type, Yukon area, 1976-1987. a

Year	Lower Yukon Gill Net b		Upper Yukon Gill Net c		Upper Yukon Fishwheel	
	Permits Issued d	Permits Fished	Permits Issued d	Permits Fished	Permits Issued d	Permits Fished
1976	678	e	118	e	169	e
1977	700	606	69	44	160	130
1978	699	642	71	47	158	137
1979	708	659	70	50	165	127
1980	709	650	71	49	163	127
1981	711	666	70	45	162	125
1982	710	664	76	45	166	111
1983	708	655	73	40	164	114
1984	708	673	73	39	159	96
1985	708	663	71	40	159	113
1986	712	672 f	74	30 f	162	132 f
1987	711	659 f	74	33 f	161	108 f

a Information for 1976-1987 obtained from CFEC unless otherwise indicated.
b Set or drift gill net.
c Set gill net only.
d Includes permanent and interim-use permits.
e Information unavailable.
f Data source: ADF&G.

Appendix Table 8. Number of commercial salmon fishing gear operators (permit holders) by district, Yukon area, 1971-1987. a

CHINOOK SALMON SEASON

	Lower Yukon Area b				Upper Yukon Area				
Year	Dist. 1	Dist. 2	Dist. 3	Subtotal	Dist. 4	Dist. 5	Dist. 6	Subtotal	Total
1971	405	154	33	592	-	-	-	-	592
1972	426	153	35	614	-	-	-	-	614
1973	438	167	38	643	-	-	-	-	643
1974	396	154	42	592	27	31	20	78	670
1975	441	149	37	627	93	52	36	181	808
1976	453	189	42	684	80	46	29	155	839
1977	392	188	46	626	87	41	18	146	772
1978	429	204	22	655	80	45	35	160	815
1979	425	210	22	657	87	34	30	151	808
1980	407	229	21	657	79	35	33	147	804
1981	448	225	23	696	80	43	26	149	845
1982	450	225	21	696	74	44	20	138	834
1983	444	212	19	675	77	34	25	136	811
1984	439	213	20	672	54	31	27	112	784
1985	421	219	18	658	74	32	27	133	791
1986	431	235	7	673	75	21	27	123	796
1987	432	233	10	675	87	30	24	141	816

FALL SEASON

	Lower Yukon Area c				Upper Yukon Area d				
Year	Dist. 1	Dist. 2	Dist. 3	Subtotal	Dist. 4	Dist. 5	Dist. 6	Subtotal	Total
1971	352	-	-	352	-	-	-	-	352
1972	353	75	3	431	-	-	-	-	431
1973	445	183		628	-	-	-	-	628
1974	322	121	6	449	17	23	22	62	511
1975	428	185	12	625	44	33	33	110	735
1976	422	194	28	644	18	36	44	98	742
1977	337	172	37	546	28	34	32	94	640
1978	429	204	28	661	24	43	30	97	758
1979	458	220	32	710	31	44	37	112	822
1980	395	232	23	650	33	43	26	102	752
1981	462	240	21	723	30	50	30	110	833
1982	445	218	15	678	15	24	25	64	742
1983	455	225	20	700	13	29	23	65	765
1984	427	216	12	655	18	39	26	83	738
1985	416	236	13	665	22	39	25	86	751
1986	377	236	14	627	1	21	16	38	665
1987	403	230	9	642	0	0	0	0	642

COMBINED SEASONS

	Lower Yukon Area				Upper Yukon Area				
Year	Dist. 1	Dist. 2	Dist. 3	Subtotal	Dist. 4	Dist. 5	Dist. 6	Subtotal	Total
1971	473	154	33	660	-	-	-	27	687
1972	476	153	35	664	-	-	-	-	664
1973	529	205	38	772	-	-	-	47	819
1974	485	190	42	717	28	43	27	98	815
1975	491	197	39	727	95	57	46	198	925
1976	482	220	44	746	96	62	56	214	960
1977	402	208	54	664	96	53	39	188	852
1978	472	221	29	722	82	53	38	173	895
1979	461	230	33	724	90	49	40	179	903
1980	432	247	27	706	88	51	38	177	883
1981	507	257	26	790	94	56	31	181	971
1982	486	244	22	752	76	53	27	156	908
1983	458	235	26	719	79	47	31	157	876
1984	453	238	26	717	58	45	33	136	853
1985	434	247	24	705	76	48	33	157	862
1986	444	259	18	721	75	30	27	132	853
1987	440	239	13	692	87	30	24	141	833

a Actual number of gear operators which made at least one delivery. Some individual fishermen in the lower Yukon area may have operated in more than one district during the year.
b Unrestricted mesh size fishing periods.
c Refers to time when 6" or smaller mesh size restriction is in effect after the chinook salmon season.
d Refers to time when fall chum salmon fishery occurs.

Appendix Table 9. Commercial chinook salmon catches by statistical area, lower Yukon area, 1971-1987.

District 1

Year	334-11	334-12	334-13	334-14	334-15	334-16	334-17	334-18	Total
1971	3,038	25,679	7,204	10,576	17,140	3,949	12,446	6,010	86,042
1972	2,845	12,307	3,608	9,403	18,582	5,331	13,469	4,507	70,052
1973	7,475	29,962	4,657	3,647	1,371	276	7,184	2,409	56,981
1974	2,935	30,174	6,984	3,987	12,721	2,048	6,826	6,165	71,840
1975	6,396	15,844	8,763	314	1,720	606	6,879	4,063	44,585
1976	8,333	27,937	7,507	851	5,101	1,415	6,164	5,102	62,410
1977	11,278	16,787	8,866	1,216	15,214	1,550	7,109	7,895	69,915
1978	886	12,237	4,135	4,388	22,019	3,738	7,533	4,070	59,006
1979	1,017	13,152	4,149	5,782	12,839	10,960	18,976	8,202	75,077
1980	464	12,832	3,235	9,224	30,737	12,333	13,654	7,903	90,382
1981	6,639	12,875	2,975	8,976	19,730	15,158	22,251	10,902	99,506
1982	3,439	11,268	2,842	9,038	9,331	7,295	18,185	13,052	74,450
1983	7,919	25,523	8,161	14,961	9,416	5,297	19,172	7,008	95,457
1984	14,385	15,320	2,598	6,297	11,123	1,434	19,089	4,425	74,671
1985	4,233	22,696	12,160	2,492	12,806	3,955	25,144	6,525	90,011
1986	4,187	7,954	3,494	5,430	10,258	1,422	15,948	4,342	53,035
1987	14,656	12,056	8,703	3,533	6,780	3,250	18,573	9,092	76,643

District 2

Year	334-21	334-22	334-23	334-24	334-25	Total
1971	5,926	7,893	3,061	2,346	-	19,226
1972	1,839	11,216	1,426	3,374	-	17,855
1973	5,959	5,574	1,106	1,220	-	13,859
1974	6,344	5,611	2,624	3,369	-	17,948
1975	3,282	3,045	2,785	2,203	-	11,315
1976	5,083	4,490	3,031	3,952	-	16,556
1977	6,577	4,584	2,110	3,451	-	16,722
1978	9,004	7,953	5,248	8,499	2,220	32,924
1979	10,698	11,214	6,733	7,573	5,280	41,498
1980	11,544	12,903	8,259	9,591	7,707	50,004
1981	12,341	13,275	7,024	5,950	7,191	45,781
1982	10,567	9,236	5,262	8,932	5,135	39,132
1983	12,433	10,424	7,779	6,260	6,333	43,229
1984	9,179	11,573	4,668	5,752	5,525	36,697
1985	11,843	18,584	4,877	4,613	8,448	48,365
1986	11,138	15,326	3,450	4,336	7,599	41,849
1987	14,195	9,672	5,663	6,376	11,552	47,458

District 3

Year	334-31	334-32	Total
1971	1,352	2,138	3,490
1972	1,783	2,058	3,841
1973	2,264	940	3,204
1974	1,423	2,057	3,480
1975	2,791	1,386	4,177
1976	1,827	2,321	4,148
1977	1,617	2,348	3,965
1978	746	2,170	2,916
1979	2,195	2,823	5,018
1980	2,039	3,201	5,240
1981	1,241	2,782	4,023
1982	896	1,713	2,609
1983	1,335	2,771	4,106
1984	900	2,139	3,039
1985	854	1,734	2,588
1986	606	295	901
1987	1,698	341	2,039

Appendix Table 10. Commercial chinook salmon catches by statistical area, upper Yukon area, 1974-1987.

District 4

Year	334-41	334-42	334-43	Total
1974	0	685	-	685
1975	15	374	-	389
1976	44 a	365	-	409
1977	317	668	-	985
1978	183	425	-	608
1979	785	370	834	1,989
1980	352	549	620	1,521
1981	106	867	374	1,347
1982	78	497	512	1,087
1983	0	382	219	601
1984	2	272	687	961
1985	0	318	346	664
1986	11	100	391	502
1987	91	999	434	1,524

District 5

Year	334-51	334-52	334-53	334-54	Total
1974	2,284	379	-	-	2,663
1975	2,602	270	-	-	2,872
1976	2,843	308	-	-	3,151
1977	4,013	149	-	-	4,162
1978	2,838	241	-	-	3,079
1979	3,389	0	-	-	3,389
1980	4,554	337	-	-	4,891
1981	97	3,051	2,477	749	6,374
1982	61	2,352	2,277	695	5,385
1983	0	632	2,738	236	3,606
1984	128	1,589	1,568	384	3,669
1985	0	1,142	1,842	434	3,418
1986	0	1,552	875	306	2,733
1987	0	1,183	1,356	566	3,105

District 6

Year	334-61	334-62	334-63	Total
1974	111	1,102	260	1,473
1975	77	153	270	500
1976	490	320	292	1,102
1977	405	365	238	1,008
1978	34	58	543	635
1979	102	336	334	772
1980	92	1,588	267	1,947
1981	438	366	183	987
1982	414	309	258	981
1983	249	364	298	911
1984	0	375	492	867
1985	15	560	567	1,142
1986	0	597	353	950
1987	0	600	602	1,202

a Does not include 493 fish (summer chum salmon) erroneously keypunched as chinook salmon in final computer summary.

Appendix Table 11. Commercial catches of chinook and summer chum salmon by mesh size, Districts 1 and 2, lower Yukon area, 1961-1987.

	Unrestricted Mesh Size a		6 inch Max. Mesh Size b	
	Districts 1 and 2		Districts 1 and 2	
Year	Chinook	Summer Chum	Chinook	Summer Chum
1961	113,434	-	-	-
1962	89,296	-	-	-
1963	109,215	-	-	-
1964	87,801	-	-	-
1965	113,031	-	-	-
1966	87,710	-	-	-
1967	124,574	10,919	-	-
1968	100,857	14,402	-	-
1969	85,387	41,418	97	15,437
1970	73,610	104,705	57	16,623
1971	103,623	42,189	1,176	57,851
1972	85,376	78,698	1,991	37,881
(Avg. 1961-72)	97,826	48,722	830	31,948
1973 c	65,269	89,841	5,168	196,540
1974	86,921	349,758	1,631	227,507
1975	50,614	148,919	4,162	345,472
1976	71,688	267,075	7,631	128,431
1977	81,073	157,909	4,720	205,634
1978	82,070	275,512	7,737	354,603
1979	95,137	136,973	22,136	434,188
1980	120,912	95,876	19,711	605,679
1981	125,698	163,979	18,648	758,767
1982	106,399	225,106	6,887	217,563
1983	107,078	121,927	31,002	590,329
1984	94,456	242,076	16,394	287,531
1985 d	114,300	170,345	22,445	265,240
1986	79,525	231,372	15,307	438,182
1987	102,274	128,017	21,827	269,757
(Avg. 1979-87)	105,087	168,408	19,373	429,693

a Primarily 8 to 8-1/2 inch mesh size used during early June to early July.
b Catch through July 15-20, relatively few chinook and summer chum salmon taken after these dates.
c Six inch maximum mesh size regulation beginning late June to early July became effective in 1973.
d Six inch maximum mesh size regulation by emergency order during commercial fishing season became effective in 1985.

Appendix Table 12. Commercial chinook salmon catch and effort data, Districts 1 and 2, lower Yukon area, 1961-1987. a

Commercial Catch			
Year	Dist. 1	Dist. 2	Total
1961	84,406	29,028	113,434
1962	67,072	22,224	89,296
1963	85,004	24,211	109,215
1964	67,555	20,246	87,801
1965	89,268	23,763	113,031
1966	70,783	16,927	87,710
1967	104,335	20,239	124,574
1968	79,465	21,392	100,857
1969	70,588	14,799	85,387
1970	56,469	17,141	73,610
1971	84,397	19,226	103,623
1972	68,059	17,317	85,376
1973	52,790	12,479	65,269
1974	69,457	17,464	86,921
1975	41,550	9,064	50,614
1976	56,392	15,296	71,688
1977	65,745	15,328	81,073
1978	53,198	28,872	82,070
1979	61,790	33,347	95,137
1980	78,157	42,755	120,912
1981	88,038	37,660	125,698
1982	70,743	35,656	106,399
1983	76,280	30,798	107,078
1984	65,101	29,355	94,456
1985	76,106	38,194	114,300
1986	42,922	36,603	79,525
1987	62,147	40,127	102,274

Effort	District 1		District 2		Total	
	Boat Hrs	CPUE	Boat Hrs	CPUE	Boat Hrs	CPUE
1961	79,224	1.07	29,118	1.00	108,342	1.05
1962	84,792	0.79	38,118	0.58	122,910	0.73
1963	72,288	1.18	27,672	0.87	99,960	1.09
1964	56,736	1.19	22,398	0.90	79,134	1.11
1965	78,096	1.14	31,008	0.77	109,104	1.04
1966	69,894	1.01	22,380	0.76	92,274	0.95
1967	102,456	1.02	37,488	0.54	139,944	0.89
1968	92,450	0.86	32,280	0.66	124,730	0.81
1969	84,864	0.83	27,828	0.53	112,692	0.76
1970	61,260	0.92	20,460	0.84	81,720	0.90
1971	73,272	1.15	19,956	0.96	93,228	1.11
1972	79,236	0.86	19,872	0.87	99,108	0.86
1973	75,036	0.70	23,496	0.53	98,532	0.66
1974	86,256	0.81	29,808	0.59	116,064	0.75
1975	49,944	0.83	8,376	1.08	58,320	0.87
1976	64,572	0.87	23,484	0.65	88,056	0.81
1977	42,618	1.54	15,180	1.01	57,798	1.40
1978	57,528	0.92	25,524	1.13	83,052	0.99
1979	53,040	1.16	23,904	1.40	76,944	1.24
1980	45,348	1.72	20,196	2.12	65,544	1.84
1981	43,632	2.02	19,536	1.93	63,168	1.99
1982	55,416	1.28	22,008	1.62	77,424	1.37
1983	38,448	1.98	18,696	1.65	57,144	1.87
1984	38,880	1.67	14,568	2.02	53,448	1.77
1985	28,176	2.70	14,832	2.58	43,008	2.66
1986	36,936	1.16	20,352	1.80	57,288	1.39
1987	32,796	1.89	18,696	2.15	51,492	1.99

a Chinook salmon season during June and early July with unrestricted mesh size gill nets.

Appendix Table 13. Chinook salmon commercial catch data by period, chinook salmon season (unrestricted mesh size), District 1, lower Yukon area, 1972-1987.

	Period Catch a (Cumulative Catch) b															
Date	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
06/01																
06/02																
06/03																
06/04																
06/05			3.5(3.5)					6.1(6.1)								
06/06		0.3(0.3)														
06/07										11.1(11.1)						
06/08			7.5(11.0)					4.9(11.0)								
06/09		2.5(2.8)					3.5(3.5)			15.6(26.7)						
06/10	0.04(0.04)								6.8(6.8)			22.3(22.3)				
06/11				0.2(0.2)												
06/12			14.7(25.7)					19.5(30.5)		14.5(41.2)						
06/13		6.6(9.4)					5.8(9.3)									
06/14	1.0(1.04)			0.4(0.6)		0.04(0.04)			26.1(32.9)			12.7(35.0)				
06/15			11.1(36.8)								5.6(5.6)					
06/16		12.1(21.5)			0.1(0.1)			9.3(39.8)		10.3(59.5)						13.0(13.0)
06/17	3.5(4.5)						17.6(25.9)		14.6(47.5)			28.6(63.6)				
06/18				1.1(1.7)		2.6(2.6)					12.4(18.0)					
06/19			18.0(55.6)		3.2(3.3)			16.7(56.5)		20.5(80.0)			13.7(13.7)			22.5(35.5)
06/20		9.1(30.6)					7.5(33.4)								21.7(21.7)	
06/21	17.0(21.5)			5.7(7.4)		10.4(13.0)			26.2(73.7)			12.7(76.3)				
06/22			2.9(58.5)					5.3(61.8)			20.0(38.0)		18.8(32.5)			
06/23		12.0(42.6)			9.6(12.9)				4.5(78.2)							15.8(50.3)
06/24	16.3(37.8)						14.4(47.8)								10.2(31.9)	
06/25				17.1(24.5)		26.3(39.3)					7.1(45.1)			23.6(23.6)		
06/26			7.2(65.7)		15.4(28.3)								16.1(48.6)			11.6(62.1)
06/27		10.2(52.8)		9.8(34.3)			5.4(53.2)							33.7(57.3)		
06/28	15.4(53.2)					17.7(57.0)										
06/29			3.8(69.5)								18.1(63.2)		16.5(65.1)			
06/30					13.8(42.1)										5.6(37.5)	
07/01	14.9(68.1)			7.3(41.6)		8.7(65.7)										
07/02					14.3(56.4)						7.5(70.7)			18.9(76.1)		
07/03																
07/04															5.4(42.9)	
07/05																
07/06																
07/07																
07/08																

a Catch by period in thousands of fish.
b Cumulative catch during unrestricted mesh size fishing periods in thousands of fish.

Appendix Table 14. Chinook salmon commercial catch data by period, chinook salmon season (unrestricted mesh size), District 2, Yukon area, 1978-1987.

	Period Catch a (Cumulative Catch) b									
Date	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
06/01										
06/02										
06/03										
06/04		1.6 (1.6)								
06/05										
06/06										
06/07		1.4 (3.0)								
06/08				7.6 (7.6)						
06/09	4.8 (4.8)		3.9 (3.9)							
06/10										
06/11		5.1 (8.1)		11.4 (19.0)						
06/12	3.2 (8.0)		7.8 (11.7)							
06/13						6.0 (6.0)				
06/14										
06/15		14.2 (22.3)		10.5 (29.5)						
06/16	4.3 (12.3)		10.9 (22.6)			7.3 (13.3)				
06/17					4.0 (4.0)					
06/18		3.9 (26.2)		8.2 (37.7)						9.5 (9.5)
06/19	7.8 (20.1)									
06/20			8.1 (30.7)			10.6 (23.9)				
06/21		7.2 (33.4)			7.8 (11.8)		5.6 (5.6)			
06/22										12.2 (21.7)
06/23	4.1 (24.2)		12.0 (42.7)			6.9 (30.8)			14.5 (14.5)	
06/24					11.9 (23.7)					
06/25							14.4 (20.0)			10.9 (32.5)
06/26	4.7 (28.9)									
06/27								7.0 (7.0)	12.3 (26.8)	
06/28					3.4 (27.1)		9.4 (29.4)			
06/29										7.6 (40.1)
06/30										
07/01					8.6 (35.7)			18.3 (25.3)		
07/02									7.4 (34.2)	
07/03										
07/04								12.9 (38.2)		
07/05										
07/06										
07/07									2.4 (36.6)	
07/08										

a Catch by period in thousands of fish.
b Cumulative catch during unrestricted mesh size fishing periods in thousands of fish.

Appendix Table 15. Commercial salmon catches taken under quotas or guideline harvest ranges, Yukon area, 1974-1987.

Chinook Salmon a

Year	Lower Yukon Area		Upper Yukon Area		
	Districts 1 and 2	District 3	District 4	District 5	District 6
1974	-	3,413 (3,000)	685 (1,000)	2,661 (3,000)	1,473 (1,000)
1975	-	4,177 (3,000)	389 (1,000)	2,865 (3,000)	500 (1,000)
1976	-	4,070 (3,000)	902 (1,000)	3,151 (3,000)	1,102 (1,000)
1977	-	3,938 (3,000)	985 (1,000)	4,162 (3,000)	1,008 (1,000)
1978	-	2,657 (2,000)	701 (1,000)	3,115 (3,000)	635 (1,000)
1979 b	-	3,073 (1,800-2,200)	1,232 (900-1,100)	3,389 (2,700-3,300)	772 (900-1,100)
1980	-	3,896 (1,800-2,200)	1,517 (900-1,100)	5,383 (2,700-3,300)	2,076 (900-1,100)
1981	145,287 (60,000-120,000)	3,220 (1,800-2,200)	1,347 (2,250-2,850)	6,452 (2,700-3,300)	1,264 (600-800)
1982	113,582 (60,000-120,000)	2,608 (1,800-2,200)	1,107 (2,250-2,850)	5,379 (2,700-3,300)	981 (600-800)
1983	138,686 (60,000-120,000)	3,318 (1,800-2,200)	601 (2,250-2,850)	3,606 (2,700-3,300)	911 (600-800)
1984	111,368 (60,000-120,000)	3,036 (1,800-2,200)	961 (2,250-2,850)	3,669 (2,700-3,300)	867 (600-800)
1985	138,376 (60,000-120,000)	2,587 (1,800-2,200)	664 (2,250-2,850)	3,418 (2,700-3,300)	1,142 (600-800)
1986	94,884 (60,000-120,000)	901 (1,800-2,200)	502 (2,250-2,850)	2,733 (2,700-3,300)	950 (600-800)
1987	124,101 (60,000-120,000)	2,039 (1,800-2,200)	1,524 (2,250-2,850)	3,105 (2,700-3,300)	1,202 (600-800)

Fall Chum and Coho Salmon a

Year	Lower Yukon Area c	Upper Yukon Area d		
	Districts 1, 2, and 3	District 4 e	District 5	District 6
1974	230,128 (200,000)	9,213 (10,000)	25,051 (25,000)	26,192 (15,000)
1975	215,439 (200,000)	13,552 (10,000)	27,212 (25,000)	18,735 (15,000)
1976	131,313 (200,000)	1,742 (10,000)	5,387 (25,000)	19,051 (15,000)
1977	199,603 (200,000)	13,996 (10,000)	25,695 (25,000)	19,910 (15,000)
1978	191,120 (200,000)	11,262 (10,000)	21,017 (25,000)	16,325 (15,000)
1979 b	229,403 (120,000-220,000)	50,375 (10,000-40,000)	51,161 (10,000-40,000)	34,316 (7,500-22,500)
1980	204,229 (120,000-220,000)	32,058 (10,000-40,000)	42,343 (10,000-40,000)	20,746 (7,500-22,500)
1981	341,760 (120,000-220,000)	19,447 (10,000-40,000)	95,844 (10,000-40,000)	29,008 (5,500-20,500)
1982	199,880 (120,000-220,000)	3,909 (10,000-40,000)	13,636 (10,000-40,000)	14,600 (5,500-20,500)
1983	220,034 (120,000-220,000)	4,482 (10,000-40,000)	43,993 (10,000-40,000)	40,257 (5,500-20,500)
1984	155,983 (120,000-220,000)	8,720 (10,000-40,000)	24,060 (10,000-40,000)	28,252 (5,500-20,500)
1985	175,602 (120,000-220,000)	25,390 (10,000-40,000)	25,338 (10,000-40,000)	54,112 (5,500-20,500)
1986	113,452 (0-110,000)	2,045 (0-20,000)	22,053 (0-20,000)	2,333 (0-10,250)
1987	0 (0-110,000)	0 (0-20,000)	0 (0-20,000)	0 (0-10,250)

a Quotas or guideline harvest range shown in parenthesis.
b Beginning in 1979 quotas were replaced by guideline harvest level ranges.
c Chum salmon only; coho salmon catch not applied toward quotas or G.H.L.
d Chum and coho salmon combined; mostly fall chum.
e Beginning in 1978 quota or guideline harvest levels in effect for area upstream of Cone Point only. Subdistrict 4-A closes August 1.

Appendix Table 16. Commercial chum salmon catches by statistical area, lower Yukon area, 1971-1987.

District 1

Year	334-11	334-12	334-13	334-14	334-15	334-16	334-17	334-18	Total
1971	834	87,740	24,766	34,891	40,617	8,063	67,635	17,915	282,461
1972	5,186	98,909	12,146	25,943	56,039	4,073	38,274	10,375	250,945
1973	17,259	176,119	39,583	18,608	61,969	6,413	52,770	22,706	395,427
1974	38,322	338,412	116,940	22,011	50,593	5,357	37,724	32,681	642,040
1975	28,970	257,485	103,423	12,078	41,295	5,779	99,232	28,244	576,506
1976	26,277	203,024	52,480	9,338	28,848	2,872	32,093	24,123	379,055
1977	34,312	181,459	54,082	9,872	41,799	1,083	41,026	18,777	382,410
1978	5,072	195,080	67,098	56,995	79,352	4,602	75,090	38,443	521,732
1979	1,791	115,528	38,161	43,263	92,706	46,401	93,777	47,713	479,340
1980	3,840	82,898	16,940	46,164	87,270	98,326	109,005	53,638	498,081
1981	25,569	206,200	26,220	76,591	91,722	51,660	143,747	53,283	674,992
1982	9,908	83,130	17,910	54,795	56,632	20,602	60,263	43,760	347,000
1983	42,300	122,374	40,200	75,016	65,665	42,903	121,328	65,749	575,535
1984	42,579	106,209	17,376	54,519	36,021	12,711	73,710	28,302	371,427
1985	14,290	87,872	32,162	46,932	76,155	11,866	79,846	28,311	377,434
1986	39,844	112,778	38,347	55,663	47,790	10,898	97,802	37,357	440,479
1987	34,852	51,350	22,794	15,109	21,646	7,786	45,911	23,450	222,898

District 2

Year	334-21	334-22	334-23	334-24	334-25	Total
1971	2,255	3,144	286	427	-	6,112
1972	3,091	22,746	250	7,718	-	33,805
1973	22,207	56,193	6,181	24,125	-	108,706
1974	39,116	52,514	11,191	24,871	-	127,692
1975	20,947	98,986	11,028	19,844	-	150,805
1976	22,282	58,016	18,173	21,931	-	120,402
1977	26,158	75,281	23,789	32,445	-	157,673
1978	48,868	132,002	31,990	60,770	5,564	279,194
1979	73,509	86,020	29,988	33,069	44,294	266,880
1980	80,931	156,962	75,513	47,772	31,407	392,585
1981	76,143	215,346	88,040	78,218	49,014	506,761
1982	60,611	103,689	27,600	61,685	25,340	278,925
1983	74,985	76,494	80,631	53,099	48,528	333,737
1984	57,212	114,732	50,738	55,259	29,793	307,734
1985	42,042	98,294	28,513	24,770	34,970	228,589
1986	50,865	145,946	41,516	58,531	42,876	339,734
1987	48,734	54,459	19,157	22,988	29,538	174,876

District 3

Year	334-31	334-32	Total
1971	26	24	50
1972	0	1,840	1,840
1973	0	463	463
1974	1,697	576	2,273
1975	0	5,590	5,590
1976	4,450	9,602	14,052
1977	12,839	6,424	19,263
1978	20,028	18,502	38,530
1979	28,272	37,698	65,970
1980	23,646	34,655	58,301
1981	35,597	37,917	73,514
1982	3,896	6,005	9,901
1983	7,713	16,905	24,618
1984	6,876	640	7,516
1985	5,045	1,911	6,956
1986	3,235	0	3,235
1987	3,418	83	3,501

Appendix Table 17. Commercial summer chum salmon sales by statistical area, upper Yukon area, 1974-1987. a,b

District 4

	334-41		334-42		334-43		Totals	
Year	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe
1974	1,200	-	28,500	-	c	c	27,866	-
1975	105,600	-	59,500	-	c	c	165,054	-
1976	178,300	-	33,000	-	c	c	211,307	-
1977	148,700	-	20,800	-	c	c	169,541	-
1978	309,500	16,920	54,900	0	c	c	364,184	16,920
1979	136,300	35,117	29,200	200	3,900	0	169,430	35,317
1980	119,400	119,957	26,200	14,385	1,800	1,482	147,560	135,824
1981	46,000	160,757	11,800	23,677	1,900	2,598	59,718	187,032
1982	1,000	137,611	1,000	12,550	1,600	1,120	3,647	151,281
1983	3,400	130,013	3,300	17,549	0	563	6,672	148,125
1984	100	148,519	700	15,184	300	3,139	1,009	166,842
1985	5,100	222,149	1,800	19,306	5,100	5,630	12,007	247,085
1986	0	236,856	241	29,169	59	3,520	300	269,545
1987	29,314	110,977	593	9,956	84	541	29,991	121,474

District 5

	334-51		334-52		334-53		334-54		Totals	
Year	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe
1974	4,500	-	d	-	-	-	-	-	6,831	-
1975	13,000	-	0	-	-	-	-	-	12,997	-
1976	700	-	0	-	-	-	-	-	774	-
1977	1,200	-	0	-	-	-	-	-	1,274	-
1978	4,900	605	0	0	-	-	-	-	4,892	605
1979	8,600	1,009	0	0	-	-	-	-	8,608	1,009
1980	500	0	0	0	0	0	0	0	456	0
1981	1,100	0	100	49	0	0	0	0	1,236	49
1982	0	21	200	0	0	0	0	0	213	21
1983	0	242	0	269	0	1,345	0	0	42	1,856
1984	100	0	600	47	0	0	0	0	645	47
1985	0	0	700	0	0	0	0	0	700	0
1986	0	0	682	0	8	0	0	0	690	0
1987	0	0	362	44	0	0	0	0	362	44

District 6

	334-61		334-62		334-63		Totals	
Year	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe
1974	1,500	-	10,500	-	1,300	-	13,318	-
1975	5,500	-	2,300	-	6,900	-	14,782	-
1976	2,900	-	1,200	-	2,500	-	6,617	-
1977	2,300	-	1,300	-	700	-	4,317	-
1978	2,200	1,468	27,900	6,116	4,800	652	34,814	8,236
1979	300	d	14,800	d	3,500	d	18,491	3,891
1980	5,200	0	29,400	2,272	4,300	1,010	35,855	3,282
1981	4,600	0	23,500	925	4,200	1,062	32,477	1,987
1982	5,000	0	12,500	1,027	4,200	490	21,597	1,517
1983	1,900	0	21,600	18	700	0	24,309	18
1984	3,800	0	42,200	152	10,200	183	56,249	335
1985	800	0	51,100	142	15,000	1,398	66,913	1,540
1986	4,697	0	31,647	1,711	14,139	435	50,483	2,146
1987	2,167	0	6,882	349	1,561	101	10,610	450

a Roe in pounds and may include small amounts of chinook salmon roe.
b Majority of summer chum salmon catches rounded to nearest 100.
c Combined with statistical area 334-42.
d Information not available.

Appendix Table 18. Commercial fall chum salmon sales by statistical area, upper Yukon area, 1974-1987. a,b

District 4

	334-41		334-42		334-43		Totals	
Year	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe
1974	-	-	9,213	-	c	c	9,213	-
1975	2,200	-	11,400	-	c	c	13,666	-
1976	400	-	1,300	-	c	c	1,742	-
1977	1,700	-	12,300	-	c	c	13,980	-
1978	-	-	11,000	1,721	c	c	10,988	1,721
1979	-	-	33,000	3,199	15,900	0	48,899	3,199
1980	-	-	15,300	1,789	12,900	2,558	27,978	4,347
1981	-	-	5,800	1,311	6,300	0	12,082	1,311
1982	-	-	1,000	20	2,900	147	3,894	167
1983	-	-	3,700	1,591	800	372	4,482	1,963
1984	-	-	3,000	1,222	4,700	993	7,625	2,215
1985	-	-	14,500	891	10,000	1,634	24,452	2,525
1986	-	-	2,045	0	0	0	2,045	0
1987	-	-	0	0	0	0	0	0

District 5

	334-51		334-52		334-53		334-54		Totals	
Year	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe
1974	23,600	-	d	-	-	-	-	-	23,551	-
1975	27,212	-	-	-	-	-	-	-	27,212	-
1976	5,300	-	100	-	-	-	-	-	5,387	-
1977	25,600	-	0	-	-	-	-	-	25,730	-
1978	20,700	3,946	300	1,274	-	-	-	-	21,016	5,220
1979	47,400	8,097	100	0	-	-	-	-	47,459	8,097
1980	40,300	605	2,000	0	0	0	0	0	41,771	605
1981	0	178	34,000	6,760	48,600	17	4,100	0	86,620	6,955
1982	8,300	0	1,100	23	4,300	19	0	0	13,593	42
1983	3,100	0	19,800	0	18,000	0	3,100	0	43,993	0
1984	1,400	0	10,300	0	9,400	0	2,900	57	24,060	57
1985	600	0	9,300	0	13,300	0	2,200	0	25,338	0
1986	1,332	0	11,907	395	7,471	0	1,343	0	22,053	395
1987	0	0	0	0	0	0	0	0	0	0

District 6

	334-61		334-62		334-63		Totals	
Year	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe
1974	9,600	-	15,400	-	1,900	-	26,884	-
1975	13,300	-	2,800	-	2,600	-	18,692	-
1976	6,400	-	7,900	-	3,600	-	17,948	-
1977	3,600	-	11,100	-	3,900	-	18,673	-
1978	4,700	1,826	8,000	1680	500	181	13,259	3,687
1979	7,100	d	21,600	d	5,500	d	34,185	7,170
1980	6,300	0	11,200	53	2,200	15	19,452	68
1981	4,900	0	18,900	2784	2,300	235	25,989	3,019
1982	700	0	4,600	596	1,500	0	6,820	596
1983	3,500	0	23,100	3009	7,500	92	34,089	3,101
1984	5,600	0	11,800	0	3,200	56	20,564	56
1985	1,500	0	34,700	0	6,200	0	42,352	0
1986	176	0	1,345	182	371	0	1,892	182
1987	0	0	0	0	0	0	0	0

a Roe in pounds and may include small amounts of coho salmon roe.
b Majority of fall chum salmon catches rounded to nearest 100.
c Combined with statistical area 334-42.
d Information not available.

Appendix Table 19. Commercial summer chum salmon catch and effort data, Districts 1 and 2, lower Yukon area, 1967-1987.

	District 1					District 2				
Year	Duration	Days Fished	Boat Hours	Catch	(Catch/Boat Hour)	Duration	Days Fished	Boat Hours	Catch	(Catch/Boat Hour)
1967	6/08-6/27	11.0	77,208	9,494	0.12	-	-	-	-	-
1968	6/06-7/03	14.0	91,380	12,995	0.14	6/13-7/02	10.5	27,600	1,407	0.05
1969	6/02-6/28	12.5	84,864	8,840	0.10	6/15-7/01	8.0	16,620	5,024	0.30
1970	6/11-7/03	10.5	58,056	87,169	1.50	6/14-7/03	9.0	15,756	17,536	1.11
1971	6/14-7/03	10.5	73,032	36,077	0.49	6/20-7/05	8.5	17,832	6,112	0.34
1972	6/08-7/01	12.5	79,236	69,658	0.88	6/15-7/01	8.5	19,296	9,040	0.47
1973 a	6/07-7/11	14.5	100,284	191,840	1.91	6/10-7/14	14.5	36,000	56,481	1.57
1974	6/03-7/13	16.5	114,624	461,025	4.02	6/05-7/16	15.5	35,316	72,281	2.05
1975	6/09-7/16	15.0	86,304	394,447	4.57	6/11-7/18	10.5	21,024	99,139	4.72
1976	6/14-7/14	12.0	90,658	272,493	3.01	6/20-7/16	11.0	32,624	99,190	3.04
1977	6/13-7/12	12.0	63,036	232,427	3.69	6/19-7/15	10.0	27,048	102,759	3.80
1978	6/08-7/15	13.5	100,008	393,785	3.94	6/08-7/14	13.5	44,376	218,196	4.92
1979	6/04-7/14	13.5	106,680	369,934	3.47	6/03-7/13	13.5	44,748	172,838	3.86
1980	6/09-7/15	12.8	89,412	391,252	4.38	6/08-7/17	12.5	48,060	308,704	6.42
1981	6/06-7/14	12.0	94,656	507,158	5.36	6/07-7/16	12.0	46,560	351,458	7.55
1982	6/14-7/13	9.5	81,240	248,950	3.06	6/16-7/16	10.0	37,920	180,321	4.76
1983	6/09-7/15	11.0	94,920	451,164	4.75	6/12-7/18	11.0	44,712	248,092	5.55
1984	6/18-7/13	8.0	67,776	291,966	4.31	6/20-7/16	8.0	32,208	234,677	7.29
1985 b	6/24-7/15	6.3	52,116	247,486	4.75	6/26-7/18	7.3	27,834	188,099	6.76
1986	6/14-7/15	8.5	66,768	381,127	5.71	6/15-7/14	7.5	33,954	288,427	8.49
1987	6/15-7/10	6.0	53,736	222,898	4.15	6/17-7/09	5.0	26,124	174,876	6.69

a Six inch maximum mesh size regulation during late June to early July became effective in 1973.
b Six inch maximum mesh size regulation by emergency order during commercial fishing season became effective in 1985.

Appendix Table 20. Commercial coho and fall chum salmon catch and effort data, District 1, lower Yukon area, 1961-1987.

Year	Duration	Days Fished a	Boat Hours	Coho Catch	Coho (Catch/Boat Hour)	Fall Chum Catch	Fall Chum (Catch/Boat Hour)
1961	8/01-8/31	16	14,772	2,855	0.19	42,461	2.87
1962	8/01-9/03	21	46,950	22,926	0.49	53,116	1.13
1963	8/09-9/06	18	2,100	5,572	2.65	no purchases	
1964	8/03-8/27	17	8,346	2,446	0.29	8,347	1.00
1965	8/02-8/04	b	b	350	b	22,936	b
1966	7/25-9/10	28	41,994	19,254	0.46	69,836	1.66
1967	7/24-8/27	21	19,272	9,925	0.51	36,451	1.89
1968	7/22-8/28	22	47,232	13,153	0.28	49,857	1.06
1969	7/21-8/23	20	39,408	14,041	0.36	128,866	3.27
1970	7/20-8/26	22	56,160	12,245	0.22	200,306	3.57
1971	7/22-8/28	22	85,344	11,582	0.14	178,744	2.09
1972	7/20-8/26	22	81,726	19,655	0.24	134,752	1.65
1973	7/19-8/25	22	107,136	34,860	0.33	173,783	1.62
1974	7/18-8/14	12	41,868	13,758	0.33	137,235	3.28
1975	7/21-8/16	12	52,128	2,240	0.04	158,183	3.03
1976	7/19-8/13	11	55,026	4,084	0.07	91,091	1.66
1977	7/18-8/23	11	50,568	30,588	0.60	129,486	2.56
1978	7/17-8/29	13	56,184	16,262	0.29	127,947	2.28
1979	7/19-8/14	8	47,352	11,231	0.24	101,400	2.14
1980	7/17-8/19	7	24,216	4,819	0.20	106,829	4.41
1981	7/16-8/17	7	35,520	11,174	0.31	167,834	4.73
1982	7/19-8/13	8	40,944	15,114	0.37	91,271	2.23
1983 c	7/18-8/12	6	25,848	4,560	0.18	124,371	4.81
1984 c	7/16-8/17	6	21,240	29,472	1.39	78,751	3.71
1985 c	7/18-8/13	5	20,592	27,674	1.34	124,801	6.06
1986 d	8/04-8/22	4	13,662	24,824	1.82	59,352	4.34
1987	No Openings						

a One day is equivalent to 24 hours during open fishing period.
b Information unavailable.
c District was divided into a Set Net Only (24 hour) area and a Gill Net (12 hour) area.
d District was divided into a Set Net Only (24 or 12 hour) area and a Gill Net (12 or 6 hour) area.

Appendix Table 21. Fall chum salmon commercial catch data by period, District 1, lower Yukon area, 1977-1987.

	Period Catch (Cumulative Catch) a										
Date	1977	1978	1979	1980	1981 b	1982	1983 c	1984 d	1985 e	1986 f	1987 g
07/18		6.3 (6.3)		4.2 (4.2)					6.3 (6.3)		
07/19	21.4 (21.4)						16.1 (16.1)				
07/20			6.0 (6.0)			4.3 (4.3)					
07/21		5.1 (11.4)			6.0 (6.0)						
07/22	2.0 (23.4)			6.6 (10.8)							
07/23						27.8 (32.1)					
07/24			7.2 (13.2)		1.3 (7.3)						
07/25		52.8 (64.2)		10.4 (21.2)							
07/26	9.7 (33.1)										
07/27			14.8 (28.0)			4.0 (36.1)					
07/28		2.8 (67.0)			57.3 (64.6)						
07/29	7.7 (40.8)			15.3 (36.5)			3.0 (19.1)				
07/30						11.7 (47.8)					
07/31			9.7 (37.7)	1.4 (37.9)	23.2 (87.8)			18.3 (18.3)			
08/01		14.4 (81.4)									
08/02	0.9 (41.7)						18.5 (37.6)		2.2 (8.5)		
08/03			17.5 (55.2)					17.1 (35.4)			
08/04		0.4 (81.8)				7.9 (55.7)					
08/05	3.2 (44.9)			6.2 (44.1)			23.7 (61.3)			11.4 (11.4)	
08/06						1.2 (56.9)			15.2 (23.7)		
08/07			37.8 (93.0)	13.5 (57.6)				1.8 (37.2)			
08/08		1.4 (83.2)								7.5 (18.9)	
08/09	50.0 (94.9)						44.0 (105.3)		35.8 (59.5)		
08/10			1.3 (94.3)			13.7 (70.6)					
08/11		1.6 (84.8)		5.2 (62.8)							
08/12	1.5 (96.4)					20.7 (91.3)	19.1 (124.4)			10.5 (29.4)	
08/13					43.8 (131.6)				65.3 (124.8)		
08/14			7.1 (101.4	1.8 (64.6)				11.8 (49.0)			
08/15		1.4 (86.2)								16.2 (45.6)	
08/16	16.6 (113.0)										
08/17								10.1 (59.1)			
08/18		10.2 (96.4)			3.9 (135.5)						
08/19				42.2 (106.8)						5.8 (31.4)	
08/20	7.0 (120.0)										
08/21											
08/22		21.9 (118.3)								8.0 (59.4)	
08/23	5.8 (125.8)										
08/24											
08/25		4.4 (122.7)									
08/26											
08/27											
08/28											
08/29		5.2 (127.9)									
08/30											

a Period and cumulative catches in thousands of fish. Fall chum salmon run usually well underway in the lower Yukon River by July 18.
b Season closed 8/01-8/12.
c Season closed 7/20-7/27.
d Season closed 7/18-8/01 and 8/8-8/12.
e Season closed 7/20-7/31.
f Season closed 7/16-8/03.
g Season closed.

Appendix Table 22. Fall Chum and coho salmon commercial catch and effort in the Set Net Only and Gill Net areas, District 1, Yukon area, 1983-1987.

Year	Set Net Area			Gill Net Area			Total		
	No. of Fishermen	Catch	Average Catch per Fisherman	No. of Fishermen	Catch	Average Catch per Fisherman	No. of Fishermen	Catch	Average Catch per Fisherman
Fall Chum Salmon									
1983	137	46,583	340	175	61,649	352	312	108,232	347
1984	137	34,817	254	164	24,307	148	301	59,124	196
1985	159	64,838	408	153	53,694	351	312	118,532	380
1986	122	28,449	233	160	30,903	193	282	59,352	210
1987 a									
Coho Salmon									
1983	137	1,021	7	175	3,536	20	312	4,557	15
1984	137	15,077	110	164	14,390	88	301	29,467	98
1985	159	12,841	81	153	14,832	97	312	27,673	89
1986	122	9,334	77	160	15,490	97	282	24,824	88
1987 a									
Combined									
1983	137	47,604	347	175	65,185	372	312	112,789	362
1984	137	49,894	364	164	38,697	236	301	88,591	294
1985	159	77,679	489	153	68,526	448	312	146,205	469
1986	122	37,783	310	160	46,393	290	282	84,176	298
1987 a									

a Season closed.

Appendix Table 23. Commercial salmon pack by species and type of processing, Yukon area, 1960-1987. a

Year	Cases (48#)			Fresh-Frozen (round wt. in lbs.)			Cured Chinook		Cured Chum		Salmon Roe (lbs.)
	Chinook	Coho	Chum	Chinook	Coho	Chum	Tierces	Half Tierces	Tierces	Half Tierces	
1960	13,000			b	b	b	250	180			
1961	19,474			b	b	b	504	146			
1962	15,959	512	1,760	b	b	b	464	280			
1963	16,400	1,190		b	b	b	b	b			
1964	12,041			b	17,000	66,770	537	499			
1965	18,149			275,000	2,500	160,500	670	67			
1966	14,026	836	2,812	414,000	61,355	301,240	398	60			
1967	21,503		126	475,900	66,400	366,496	627	96			1,755
1968	19,499		816	561,690	93,154	454,409	351	170			21,000
1969	9,560	1,104	4,499	423,597	26,973 c	829,586 c	647	95	15		29,000
1970	6,431	1,002	6,413	716,600	12,900	1,725,000	447	191	51		26,300
1971	6,500	502	3,213	1,058,034	45,836	1,432,455	659	229	139		55,177
1972	7,418	1,005	6,249	1,002,395	83,960	1,495,922	497	147			85,278
1973	5,227	1,008	9,902	1,339,317	181,928	2,929,532	61	133		72	137,594
1974	6,660	603	21,074	1,062,666	58,816	3,879,300	381	56	57		208,842
1975	5,297	40	14,226	781,902	13,299	4,751,941	80	53	45	119	201,404
1976	3,921	80	11,375	1,398,779	29,778	4,256,679	93	92	72	10	226,893
1977	4,642	415	9,428	1,513,484	270,241	4,877,918	180	237	26		210,568
1978	5,711	74	9,340	1,473,354	168,241	8,639,156	222	117	7	75	261,422
1979	6,277	22	7,854	2,014,156	108,011	8,098,075	112	91		2	410,540
1980	8,764	130	15,783	3,341,262	56,295	8,781,062	29	18		37	579,927
1981	1,107	378	11,573	3,686,238	130,097	11,398,680	25	13	9	28	507,550
1982		7	751	2,790,456	246,500	4,992,877		19		1	584,053
1983		198	1,181	3,000,843	72,447	10,637,613	5	39		7	426,220
1984		5	1,768	2,426,205	590,526	5,516,532		36		16	468,244
1985				2,953,199	409,725	5,462,462		9		20 d	476,024
1986				2,012,324	299,054	5,960,857		15		28 e	502,952
1987				2,830,312	0	3,013,889		36		.	286,099

a Pack represents type of processing when fish were shipped out of districts.

b Information not available.

c Includes approximately 11,600 and 110,500 (round weight) of coho and chum salmon respectively, as salted fish for Japanese market.

d Additionally 13 half tierces of coho salmon were packed.

e Additionally 2 half tierces of coho salmon were packed.

Appendix Table 24. Dollar value estimates of Yukon area commercial salmon fishery, fishery, 1961-1987.

Year	Gross Value of Catch to Fishermen					Wholesale Value of Pack a	State Tax b Revenues
	Chinook	Coho	Chum	Roe	Total		
1961	420,900	1,400	14,700	-	437,000	1,292,300	37,500
1962	330,300	11,500	20,100	-	361,900	1,275,250	50,400
1963	409,500	2,800	-	-	412,300	1,500,400	42,000
1964	351,000	1,200	2,200	-	354,400	1,203,800	35,000
1965	531,400	200	10,700	-	542,300	1,412,700	42,000
1966	419,900	9,600	25,000	-	454,500	1,308,100	37,000
1967	583,700	5,500	17,200	-	606,400	1,864,800	41,700
1968	494,300	6,700	34,000	-	535,000	1,655,200	47,000
1969	415,000	8,200	96,000	-	519,200	1,976,200	40,000
1970	401,300	10,300	211,500	-	623,100	2,113,100	45,000
1971	590,100	10,000	182,900	-	783,000	2,106,600	42,000
1972	547,800	20,400	215,800	-	784,000	2,405,200	45,300
1973	561,400	46,500	609,100	-	1,217,000	4,453,900	62,800
1974	881,300	28,400	1,011,300	-	1,921,000	6,035,900	84,100
1975	589,000	3,500	1,201,400	-	1,793,900	4,939,700	87,100
1976	983,500	8,600	1,158,900	-	2,131,000	6,815,500	96,900
1977	1,928,400	143,000	1,997,300	-	4,068,700	10,499,400	151,000
1978	2,133,700	79,200	3,101,800	-	5,314,700	14,194,800	179,400
1979	3,008,000	84,400	4,527,100	-	7,619,500	19,048,800	248,600
1980	3,639,300	21,800	2,311,600	365,200	5,871,300	14,678,250	205,400
1981	4,635,500	91,900	5,323,300	601,100	10,651,800	26,629,500	322,500
1982	3,871,300	153,700	2,693,800	422,500	7,141,300	17,853,250	222,000
1983	4,198,600	29,000	2,499,800	257,400	6,984,800	17,462,000	230,000
1984	3,620,400	268,800	1,498,000	301,800	5,689,000	14,222,500	194,000
1985	4,389,100	202,600	1,952,700	487,200	7,031,600	17,579,000	227,100
1986	3,238,500	212,500	2,232,400	565,400	6,248,800	15,622,000	205,200
1987	5,521,100	0	1,372,400	270,800	7,164,300	17,910,750	232,700

a Based on type of processing when fish were shipped out of the area.

b Processors tax and vessel and crewmember license fees. Does not include CFEC permit fee.

Appendix Table 25. Estmated average prices paid to fishermen, Yukon area, 1961-1987.

PRICE PER FISH

	Lower Yukon Area				Upper Yukon Area			
Year	Chinook	Summer Chum	Fall Chum	Coho	Chinook	Summer Chum	Fall Chum	Coho
1961	$3.50							
1962	3.50							
1963	3.50							
1964	3.75		0.25	0.50				
1965	4.50		0.35					
1966	4.50		0.35	0.50				
1967	4.50	0.35	0.35	0.50				
1968	4.64	0.50	0.50	0.50				
1969	4.60	0.50	0.50	0.55				
1970	5.00	0.61	0.61	0.84				
1971	5.34	0.64	0.64	0.82				
1972	5.90	0.75	0.75	0.92				
1973	7.45	1.18	1.18	1.27				
1974	9.00	1.36	1.58	1.75	8.67	1.00	1.00	1.00
1975	9.24	1.30	1.50	1.51	16.25	1.12	1.12	1.12
1976	11.17	1.56	1.80	1.78	12.96	1.22	1.22	1.22
1977	20.32	2.80	3.60	3.75	24.17	1.75	1.75	1.75
1978	21.60	3.20	3.62	4.20	15.38	1.54	1.97	1.97
1979	22.74	3.87	5.05	5.87	20.20	1.65	2.24	2.24
1980	23.41	1.38	1.93	2.32	13.60	1.52	2.08	1.89
1981	29.76	3.00	4.40	4.08	23.70	1.42	2.59	2.00
1982	32.43	2.80	4.27	4.59	21.83	1.28	2.10	2.41
1983	28.70	2.45	2.69	2.45	20.63	1.06	1.46	1.86
1984	30.75	1.77	2.40	3.50	18.62	1.47	1.90	1.46
1985	30.45	2.35	3.62	3.92	15.82	1.40	1.88	2.11
1986	32.93	2.62	3.53	4.47	17.53	1.34	1.12	1.26
1987	42.97	3.33			15.80	1.29		

PRICE PER POUND

	Lower Yukon Area				Upper Yukon Area				
Year	Chinook	Summer Chum	Fall Chum	Coho	Chinook	Summer Chum	Fall Chum	Coho	Roe
1964	0.17		0.03						
1965	0.20								
1966	0.20								
1967	0.19	0.05	0.05	0.07					
1968	0.18	0.06	0.06						
1969	0.19	0.08	0.08	0.08					
1970	0.22	0.09	0.09	0.12					
1971	0.24	0.10	0.10	0.12					
1972	0.24	0.11	0.11	0.13					
1973	0.30	0.16	0.16	0.18					
1974	0.38	0.21	0.21	0.25	0.50	0.15	0.13	0.15	0.75
1975	0.42	0.20	0.20	0.21	0.92	0.17	0.14	0.17	1.16
1976	0.51	0.24	0.24	0.27	0.74	0.19	0.16	0.19	1.33
1977	0.85	0.40	0.45	0.50	1.37	0.27	0.22	0.27	2.66
1978	0.90	0.45	0.47	0.60	0.87	0.24	0.25	0.24	a
1979	1.09	0.52	0.68	0.80	1.00	0.25	0.29	0.25	3.00
1980	1.04	0.20	0.28	0.36	0.85	0.23	0.27	0.29	2.50
1981	1.20	0.40	0.55	0.60	1.00	0.20	0.35	0.35	3.00
1982	1.41	0.40	0.55	0.69	1.02	0.18	0.28	0.37	2.75
1983	1.40	0.34	0.34	0.35	1.08	0.16	0.19	0.31	1.66
1984	1.50	0.26	0.32	0.50	0.95	0.23	0.26	0.24	1.78
1985	1.50	0.35	0.47	0.53	0.86	0.23	0.25	0.33	1.94
1986	1.63	0.38	0.49	0.71	0.89	0.22	0.14	0.21	2.08
1987	1.98	0.49			0.79	0.19			2.22

a Data unavailable.

Appendix Table 26. Average weight of salmon, commercial catch, Yukon area, 1964-1987.

	AVERAGE WEIGHT IN POUNDS a							
	Lower Yukon Area				Upper Yukon Area			
Year	Chinook	Summer Chum	Fall Chum	Coho	Chinook	Summer Chum	Fall Chum	Coho
1964	22.6	-	-	-				
1965	23.0	-	-	-				
1966	23.0	-	-	-				
1967	24.0	-	-	7.3				
1968	26.5	-	-	-				
1969	23.9	-	-	6.7				
1970	22.3	-	-	7.1				
1971	22.6	-	-	6.9				
1972	24.6	6.6	7.6	7.1				
1973	24.5	6.8	7.9	7.1				
1974	23.7	6.5	7.5	7.0	17.3	6.7	7.7	6.7
1975	22.0	6.5	7.5	7.2	17.7	6.6	8.0	6.6
1976	21.9	6.5	7.5	6.6	18.4	6.4	8.0	7.5
1977	23.9	7.0	8.0	7.5	17.6	6.5	8.0	6.5
1978	24.0	7.1	7.7	7.0	20.2	6.8	7.4	6.4
1979	20.9	7.4	7.4	7.3	20.2	6.6	7.7	6.5
1980	22.5	6.9	6.9	6.4	16.0	6.6	7.7	6.5
1981	24.8	7.5	8.0	6.8	23.7	7.1	7.4	5.7
1982	23.0	7.1	7.7	6.7	21.4	7.1	7.5	6.5
1983	20.5	7.2	7.9	7.0	19.1	6.6	7.7	6.0
1984	20.5	6.8	7.5	7.0	19.6	6.4	7.3	6.1
1985	20.3	6.7	7.7	7.4	18.4	6.1	7.5	6.4
1986	20.2	6.9	7.2	6.3	19.7	6.1	8.0	6.0
1987	21.7	6.8			20.0	6.8		

a Information not available for some species. Data obtained from age-length-weight samples or fish ticket entries.

Appendix Table 27. Yukon River chinook salmon catches in numbers of fish by village, 1975-1987. a

Village	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Mouth to Anuk River													
Sheldons Pt.	108	122	302	546	91	427	163	79	1,021	802	143	592	1,173
Alakanuk	130	363	213	1,125	893	1,595	423	336	1,582	1,028	517	1,027	1,180
Emmonak	55	398	62	2,738	1,362	1,175	1,021	1,328	2,436	2,099	1,382	1,754	2,518
Kotlik	204	472	173	837	533	472	675	568	1,224	695	1,029	1,902	2,407
Subtotal	497	1,355	750	5,246	2,879	3,669	2,282	2,311	6,263	4,624	3,071	5,275	7,278
Anuk River to Owl Slough													
Mt. Village	394	397	172	817	1,025	843	811	218	1,875	1,217	672	1,367	2,252
Pitkas Pt.-St. Marys	438	1,273	576	1,314	1,718	1,297	1,380	985	2,432	2,663	778	1,717	2,457
Pilot Station	107	502	556	1,027	804	433	399	428	2,703	1,116	896	1,452	2,593
Marshall	436	694	364	806	721	1,101	990	478	2,055	2,176	1,122	1,947	2,564
Subtotal	1,375	2,866	1,668	3,964	4,268	3,674	3,580	2,109	9,065	7,172	3,468	6,483	9,866
Owl Slough to Bonasila R.													
Russian Mission	2,098	1,328	639	1,498	1,476	1,660	1,689	1,628	2,634	1,938	974	1,747	2,036
Holy Cross	2,792	1,492	1,920	2,404	1,787	3,123	2,312	1,731	2,276	2,456	2,368	2,505	2,625
Subtotal	4,890	2,820	2,559	3,902	3,263	4,783	4,001	3,359	4,910	4,394	3,342	4,252	4,661
Lower Yukon Total	6,762	7,041	4,977	13,112	10,410	12,126	9,863	7,779	20,238	16,190	9,881	16,010	21,805
Bonasila R. to Illinois Cr.													
Anvik	83	84	67	180	261	161	191	354	744	576	405	959	428
Grayling	100	117 b	149	292	391	3,664	222	294	951	879	903	1,837	1,322
Kaltag	192	57	216	127	435	694	179	344	652	487	669	1,080	1,117
Nulato	1,119	968	1,531	1,354	1,245	2,297	1,117	811	1,135	966	1,063	1,835	1,573
Koyukuk	50	437	752	518	495	699	541	493	966	1,009	194	569	609
Galena	1,294	435	1,155	945	1,591	1,205	570	735	1,477	1,226	1,329	1,046	1,270
Ruby-Kokrines	912	1,959	735	1,539	2,221	1,736	964	1,168	2,346	1,107	1,657	1,263	927
Subtotal	3,750	4,057	4,605	4,955	6,639	10,456	3,784	4,199	8,271	6,250	6,220	8,589	7,246
Illinois Cr. to U.S. Can. Border													
Tanana	80	1,338	858	1,851	1,604	5,711	2,517	2,230	5,547	2,682	1,248	1,672	4,021
Rampart	517	581	1,194	987	1,820	1,169	488	887	1,070	876	1,302	1,700	2,815
Stevens Village	362	643 c	1,242 c	3,178	2,194 c	3,962 c	2,387 c	3,745 c	5,203 c	4,676 c	4,628 c	4,601 c	4,363 c
Beaver	168	188	299	558	394	506	552	250	220	553	506	708	466
Ft. Yukon	215	1,158	1,061	2,642	1,922	2,527	2,794	1,894	1,887	3,608	2,900	3,083	3,950
Circle	16	528	304	212	1,175	769	728	969	648	545	2,259	2,233	1,614
Eagle	20	633	1,171	963	2,888	2,880	3,782	2,864	2,183	1,998	2,247	1,915	2,020
Subtotals	1,378	5,069	6,129	10,391	11,997	17,524	13,248	12,839	16,758	14,938	15,090	15,912	19,249

-Continued-

Appendix Table 27. Yukon River chinook salmon catches in numbers of fish by village, 1975-1987 (Continued).

Village	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Innoko River													
Shageluk	-	11	-	-	62	35	10	-	-	-	-	53	47
Subtotal	-	11	-	-	62	35	10	-	-	-	-	53	47
Koyukuk River													
Huslia	23	21	50	132	146	154	61	125	459	169	144	82	182
Hughes	25	155	72	216	180	226	402	479	318	856	778	296	177
Alatna	0	0	1	7	2	20	0	6	6	2	-	-	-
Allakaket	151	231	172	239	236	197	185	268	700	373	283 d	563 d	309 d
Subtotal	199	407	295	594	564	597	648	878	1,483	1,400	1,205	941	668
Tanana River													
Minto-Manley	213	326	752	298	269	764	711	797	1,265	722	2,130	971	414
Nenana	533	864	742	807	800	771	974	1,195	966	2,556	4,919	2,093	3,151
Fairbanks	32	31	81	126	264	291	400	451	475	321	326	637	531
Subtotal	778	1,221	1,575	1,231	1,333	1,826	2,085	2,443	2,706	3,599	7,375	3,701	4,096
Chandalar River													
Venetie	-	-	-	14	-	160	52	20	22	51	-	32	13
Subtotal	-	-	-	14	-	160	52	20	22	51	-	32	13
Upper Yukon Total	6,105	10,765	12,604	17,185	20,595	30,598	19,827	20,379	29,240	26,238	29,890	29,228	31,319
Alaska Total	12,867	17,806	17,581	30,297	31,005	42,724	29,690	28,158	49,478	42,428	39,771	45,238	53,124
Yukon Territory Villages													
Old Crow Porcupine R.	100	25	29	-	100	-	100	400	200	500	150	300	-
Dawson	-	500	531	421	1,200	-	1,016	20	-	-	-	-	-
Stewart River	-	-	-	-	-	-	1,000	62	-	-	-	-	-
Mayo-Stewart Crossing	-	-	61	105	-	-	-	720	-	-	-	-	-
Durvash-Kluane River	-	-	-	-	-	-	-	0	-	-	-	-	-
Fort Selkirk	-	-	-	-	-	-	-	164	-	-	-	-	-
Pelly	-	200	265	500	-	-	-	3,142	-	-	-	-	-
Faro	-	-	-	-	-	-	3,286	-	-	-	-	-	-
Ross River	-	-	-	-	-	-	-	440	-	-	-	-	-
Minto	-	-	-	-	-	-	400	-	-	-	-	-	-
Carmacks	-	800	1,121	1,280	3,000	-	-	3,172	-	-	-	-	-
Lake Labarge-Whitehorse	-	-	-	-	-	-	3,042	7	-	-	-	-	-
Teslin-Johnson's Crossing	-	-	800	600	-	-	-	500	-	-	-	-	-
Subtotal e	3,000 f	1,525	2,807	2,906	4,200	13,046 f	9,216	8,268	5,625 f	6,610 f	6,428 f	9,267 f	6,326 f
Total	15,867	19,331	20,388	33,203	35,205	55,770	38,906	36,426	55,103	49,038	46,199	54,505	59,450

a 1961-1974 data available from 1981 Yukon Area Annual Management Report.
b Includes Shageluk catches.
c Includes catches by Fairbanks permit holders that fished in Yukon River near bridge crossing.
d Alatna combined with Allakaket.
e Data by village obtained from annual management reports. Subtotals include revised catch data and summation of village catches may not equal subtotal.
f Catch by village not available.

Appendix Table 28. Subsistence and commercial chinook salmon catches by district and country, Yukon River drainage, 1978-1987.

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
District 1										
Subsistence	5,246	2,879	3,669	2,282	2,311	6,263	4,624	3,071	5,275	7,278
Commercial	59,006	75,007	90,382	99,506	74,450	95,457	74,671	90,011	53,035	76,643
Subtotal	64,252	77,886	94,051	101,788	76,761	101,720	79,295	93,082	58,310	83,921
District 2										
Subsistence	3,964	4,268	3,674	3,580	2,109	9,065	7,172	3,468	6,483	9,866
Commercial	32,924	41,498	50,004	45,781	39,132	43,229	36,697	48,365	41,849	47,458
Subtotal	36,888	45,766	53,678	49,361	41,241	52,294	43,869	51,833	48,332	57,324
District 3										
Subsistence	3,902	3,263	4,783	4,001	3,359	4,910	4,394	3,342	4,252	4,661
Commercial	2,916	5,018	5,240	4,023	2,609	4,106	3,039	2,588	901	2,039
Subtotal	6,818	8,281	10,023	8,024	5,968	9,016	7,433	5,930	5,153	6,700
Lower Yukon Total										
Subsistence	13,112	10,410	12,126	9,863	7,779	20,238	16,190	9,881	16,010	21,805
Commercial	94,846	121,523	145,626	149,310	116,191	142,792	114,407	140,964	95,785	126,140
Total	107,958	131,933	157,752	159,173	123,970	163,030	130,597	150,845	111,795	147,945
District 4										
Subsistence a	5,549	7,265	11,088	4,442	5,077	9,754	7,650	7,425	9,583	7,961
Commercial	608	1,989	1,521	1,347	1,087	601	961	664	502	1,524
Subtotal	6,157	9,254	12,609	5,789	6,164	10,355	8,611	8,089	10,085	9,485
District 5										
Subsistence b	10,405	11,997	17,684	13,300	12,859	16,780	14,989	15,090	15,944	19,262
Commercial	3,079	3,389	4,891	6,374	5,385	3,606	3,669	3,418	2,733	3,105
Subtotal	13,484	15,386	22,575	19,674	18,244	20,386	18,658	18,508	18,677	22,367
District 6										
Subsistence	1,231	1,333	1,826	2,085	2,443	2,706	3,599	7,375	3,701	4,096
Commercial	635	772	1,947	987	981	911	867	1,142	950	1,202
Subtotal	1,866	2,105	3,773	3,072	3,424	3,617	4,466	8,517	4,651	5,298
Upper Yukon Total										
Subsistence	17,185	20,595	30,598	19,827	20,379	29,240	26,238	29,890	29,228	31,319
Commercial	4,322	6,150	8,359	8,708	7,453	5,118	5,497	5,224	4,185	5,831
Total	21,507	26,745	38,957	28,535	27,832	34,358	31,735	35,114	33,413	37,150
Alaska Totals										
Subsistence	30,297	31,005	42,724	29,690	28,158	49,478	42,428	39,771	45,238	53,124
Commercial	99,168	127,673	153,985	158,018	123,644	147,910	119,904	146,188	99,970	131,971
Total	129,465	158,678	196,709	187,708	151,802	197,388	162,332	185,959	145,208	185,095
Canada										
Subsistence	2,906	4,200	13,046	9,216	8,268	5,625	6,610	6,428	9,267	6,326
Commercial	2,975	6,175	9,500	8,593	8,640	13,027	9,885	12,573	10,797	10,704
Total	5,881	10,375	22,546	17,809	16,908	18,652	16,495	19,001	20,064	17,030
U.S./Canada Totals										
Subsistence	33,203	35,205	55,770	38,906	36,426	55,103	49,038	46,199	54,505	59,450
Commercial	102,143	133,848	163,485	166,611	132,284	160,937	129,789	158,761	110,767	142,675
Totals	135,346	169,053	219,255	205,517	168,710	216,040	178,827	204,960	165,272	202,125

a Includes Innoko and Koyukuk River drainages.
b Includes Chandalar and Black River drainages.

Appendix Table 29. Subsistence and commercial summer chum salmon catches by district, Yukon area, 1978-1987.

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
District 1										
Subsistence	30,897	16,144	15,972	11,310	18,452	24,679	28,459	24,349	38,854	30,760
Commercial	393,785	369,934	391,252	507,158	249,516	451,164	292,676	247,486	381,127	222,898
Subtotal	424,682	386,078	407,224	518,468	267,968	475,843	321,135	271,835	419,981	253,658
District 2										
Subsistence	21,684	23,276	13,681	14,218	18,442	27,396	26,996	19,795	41,496	33,134
Commercial	227,548	172,838	308,704	351,878	182,344	248,092	236,931	188,099	288,427	174,876
Subtotal	249,232	196,114	322,385	366,096	200,786	275,488	263,927	207,894	329,923	208,010
District 3										
Subsistence	1,706	2,946	3,242	4,929	5,840	4,609	7,351	3,687	5,528	4,161
Commercial	27,003	40,015	44,782	54,471	4,086	14,600	1,087	1,792	442	3,501
Subtotal	28,709	42,961	48,024	59,400	9,926	19,209	8,438	5,479	5,970	7,662
Lower Yukon Total										
Subsistence	54,287	42,366	32,895	30,457	42,734	56,684	62,806	47,831	85,878	68,055
Commercial	648,336	582,787	744,738	913,507	435,946	713,856	530,694	437,377	669,996	401,275
Total	702,623	625,153	777,633	943,964	478,680	770,540	593,500	485,208	755,874	469,330
District 4										
Subsistence a	110,059	123,740	221,201	139,572	199,985	136,045	112,965	165,383	166,072	157,406
Commercial b	381,104	204,747	234,837	241,826	120,513	166,056	221,964	321,939	359,193	109,320
Subtotal	491,163	328,487	456,038	381,398	320,498	302,101	334,929	487,322	525,265	266,726
District 5										
Subsistence	21,028	23,878	8,594	27,308	9,791	23,943	31,535	26,996	21,833	24,850
Commercial c	4,892	8,608	456	1,236	213	42	645	700	690	362
Subtotal	25,920	32,486	9,050	28,544	10,004	23,985	32,180	27,696	22,523	25,212
District 6										
Subsistence	11,770	6,203	9,708	10,947	8,459	23,714	23,441	24,618	17,042	25,603
Commercial c	34,814	18,491	35,855	32,477	21,597	24,309	56,249	66,913	50,483	10,610
Subtotal	46,584	24,694	45,563	43,424	30,056	48,023	79,690	91,531	67,525	36,213
Total Upper Yukon										
Subsistence	142,857	153,821	239,503	177,827	218,235	183,702	167,941	216,997	204,947	207,859
Commercial	420,810	231,846	271,148	275,539	142,323	190,407	278,858	389,552	410,366	120,292
Total	563,667	385,667	510,651	453,366	360,558	374,109	446,799	606,549	615,313	328,151
Alaska Total										
Subsistence	197,144	196,187	272,398	208,284	260,969	240,386	230,747	264,828	290,825	275,914
Commercial	1,069,146	814,633	1,015,886	1,189,046	578,269	904,263	809,552	826,929	1,080,362	521,567
Total	1,266,290	1,010,820	1,288,284	1,397,330	839,238	1,144,649	1,040,299	1,091,757	1,371,187	797,481

a Includes Koyukuk and Innoko River drainages.
b In 1986, 80.2% of the reported subsistence harvest in District 4 (excluding Koyukuk and Innoko River catches) was estimated to have been taken during commercial fishing activities. This relationship was used to adjust total estimated commercial related harvests from Appendix Table 6 for 1980-1987.
c Harvest of females for commercial roe sales believed to be reported as subsistence.

Appendix Table 30. Subsistence and commercial fall chum salmon catches by district and country, Yukon River drainage, 1978-1987.

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
District 1										
Subsistence	390	15,788	7,433	15,540	10,016	8,238	8,885	13,275	9,000	18,467
Commercial	127,947	109,406	106,829	167,834	97,484	124,371	78,751	129,948	59,352	0
Subtotal	128,337	125,194	114,262	183,374	107,500	132,609	87,636	143,223	68,352	18,467
District 2										
Subsistence	1,297	14,662	12,435	11,770	9,511	10,341	11,394	11,544	13,483	13,454
Commercial	51,646	94,042	83,881	154,883	96,581	85,645	70,803	40,490	51,307	0
Subtotal	52,943	108,704	96,316	166,653	106,092	95,986	82,197	52,034	64,790	13,454
District 3										
Subsistence	266	2,443	2,320	2,893	1,659	2,863	2,233	2,290	1,785	2,853
Commercial	11,527	25,955	13,519	19,043	5,815	10,018	6,429	5,164	2,793	0
Subtotal	11,793	28,398	15,839	21,936	7,474	12,881	8,662	7,454	4,578	2,853
Lower Yukon Total										
Subsistence	1,953	32,893	22,188	30,203	21,186	21,442	22,512	27,109	24,268	34,774
Commercial	191,120	229,403	204,229	341,760	199,880	220,034	155,983	175,602	113,452	0
Total	193,073	262,296	226,417	371,963	221,066	241,476	178,495	202,711	137,720	34,774
District 4										
Subsistence a	10,652	37,896	23,675	20,123	20,319	34,209	31,152	25,275	26,496	41,901
Commercial c	10,988	48,899	27,978	12,082	3,894	4,482	7,625	24,452	2,045	0
Subtotal	21,640	86,795	51,653	32,205	24,213	38,691	38,777	49,727	28,541	41,901
District 5										
Subsistence b	51,705	110,792	76,466	111,567	71,828	105,103	98,433	117,125	88,124	129,248
Commercial c	21,016	47,459	41,771	86,620	13,593	43,993	24,060	25,338	22,053	0
Subtotal	72,721	158,251	118,237	198,187	85,421	149,096	122,493	142,463	110,177	129,248
District 6										
Subsistence	30,557	51,766	50,328	26,632	19,564	32,174	22,726	36,963	25,155	39,911
Commercial c	13,259	34,185	19,452	25,989	6,820	34,089	20,564	42,352	1,892	0
Subtotal	43,816	85,951	69,780	52,621	26,384	66,263	43,290	79,315	27,047	39,911
Upper Yukon Total										
Subsistence	92,914	200,454	150,469	158,322	111,711	171,486	152,311	179,363	139,775	211,060
Commercial	45,263	130,543	89,201	124,691	24,307	82,564	52,249	92,142	25,990	0
Total	138,177	330,997	239,670	283,013	136,018	254,050	204,560	271,505	165,765	211,060
Alaska Totals										
Subsistence	94,867	233,347	172,657	188,525	132,897	192,928	174,823	206,472	164,043	245,834
Commercial	236,383	359,946	293,430	466,451	224,187	302,598	208,232	267,744	139,442	0
Total	331,250	593,293	466,087	654,976	357,084	495,526	383,055	474,216	303,485	245,834
Canada Totals										
Subsistence d	6,210	13,000	13,218	7,021	4,779	3,500	6,335	5,519	3,372	3,904
Commercial	3,356	9,084	9,000	15,260	11,312	25,990	22,932	35,746	11,464	40,341
Total	9,566	22,084	22,218	22,281	16,091	29,490	29,267	41,265	14,836	44,245
Yukon River drainage Totals										
Subsistence	101,077	246,347	185,875	195,546	137,676	196,428	181,158	211,991	167,415	249,738
Commercial	239,739	369,030	302,430	481,711	235,499	328,588	231,164	303,490	150,906	40,341
Total	340,816	615,377	488,305	677,257	373,175	525,016	412,322	515,481	318,321	290,079

a Includes Innoko and Koyukuk River drainages.
b Includes Chandalar and Black River drainages.
c Harvest of females for commercial roe sales believed to be reported as subsistence.
d Includes small numbers of coho salmon taken at Old Crow.

Appendix Table 31. Subsistence and commercial coho salmon catches by district, Yukon area, 1978-1987.

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
District 1										
Subsistence	1,142	3,184	1,808	3,769	11,192	3,590	6,095	3,246	2,725	6,396
Commercial	16,460	11,369	4,829	13,129	15,115	4,595	29,472	27,676	24,824	0
Subtotal	17,602	14,553	6,637	16,898	26,307	8,185	35,567	30,922	27,549	6,396
District 2										
Subsistence	598	1,132	4,801	3,736	10,229	6,072	7,066	4,834	9,140	6,894
Commercial	5,835	2,850	2,660	7,848	14,179	2,557	43,064	17,125	21,197	0
Subtotal	6,433	3,982	7,461	11,584	24,408	8,629	50,130	21,959	30,337	6,894
District 3										
Subsistence	223	12	91	490	675	917	740	376	781	682
Commercial	758	0	0	419	87	0	621	171	793	0
Subtotal	981	12	91	909	762	917	1,361	547	1,574	682
Lower Yukon Total										
Subsistence	1,963	4,328	6,700	7,995	22,096	10,579	13,901	8,456	12,646	13,972
Commercial	23,053	14,219	7,489	21,396	29,381	7,152	73,157	44,972	46,814	0
Total	25,016	18,547	14,189	29,391	51,477	17,731	87,058	53,428	59,460	13,972
District 4										
Subsistence a	145	259	7,734	2,259	2,952	3,946	2,867	3,949	2,631	3,551
Commercial	32	155	30	0	15	0	1,095	938	0	0
Subtotal	177	414	7,764	2,259	2,967	3,946	3,962	4,887	2,631	3,551
District 5										
Subsistence b	970	595	561	1,713	3,428	2,448	17,467	8,098	5,870	6,885
Commercial	1	0	0	0	0	0	0	0	0	0
Subtotal	971	595	561	1,713	3,428	2,448	17,467	8,098	5,870	6,885
District 6										
Subsistence	4,709	4,612	5,163	9,261	7,418	6,922	14,785	11,761	13,321	24,195
Commercial	3,066	2,791	1,226	2,284	7,780	6,168	7,688	11,762	441	0
Subtotal	7,775	7,403	6,389	11,545	15,198	13,090	22,473	23,523	13,762	24,195
Upper Yukon Total										
Subsistence	5,824	5,466	13,458	13,233	13,798	13,316	35,119	23,808	21,822	34,631
Commercial	3,099	2,946	1,256	2,284	7,795	6,168	8,783	12,700	441	0
Total	8,923	8,412	14,714	15,517	21,593	19,484	43,902	36,508	22,263	34,631
Area Total										
Subsistence c	7,787	9,794	20,158	21,228	35,894	23,895	49,020	32,264	34,468	48,603
Commercial	26,152	17,165	8,745	23,680	37,176	13,320	81,940	57,672	47,255	0
Total	33,939	26,959	28,903	44,908	73,070	37,215	130,960	89,936	81,723	48,603

a Includes Innoko and Koyukuk River drainages.
b Includes Chandalar and Black River drainages.
c Small numbers of coho salmon taken at Old Crow in Canada are included with fall chum catches.

Appendix Table 32. Subsistence and personal use salmon catches taken under authority of a permit, Upper Yukon area, 1973-1987. a

Upper Tanana River (upstream of Wood River) subsistence salmon fishery

Year	No. of Permits Issued	No. Reporting Catches b	Chinook	Summer Chum	Fall Chum and coho
1973	22	4	26	771	886
1974	70	c	38	1,373	1,580
1975	36	c	32	751	864
1976	110	c	31	1,314	1,512
1977	89	33	81	118	607
1978	160	126	126	2,729	1,188
1979	246	199	264	2,384	4,459
1980	315	254	282	3,729	4,059
1981	346	228	440	3,239	5,770
1982	330	209	451	2,708	4,521
1983	259	147	475	2,276	3,830
1984	308	212	321	3,177	5,134
1985	291	155	326	2,646	3,937
1986	323	211	637	4,031	4,437
1987	289	183	531	2,739	5,781

Upper Tanana River (Big Delta area) subsistence chum salmon carcass fishery

Year	No. of Permits Issued	No. Reporting Catches	Fall Chum Carcasses
1973	16	8	1,561
1974	21	c	1,974
1975	26	c	2,573
1976	36	c	3,441
1977	46	29	5,816
1978	70	43	2,517
1979	32	25	4,582
1980	57	36	4,915
1981	43	27	5,030
1982	37	13	1,690
1983	45	29	5,357
1984	31	14	2,353
1985	30	14	2,111
1986	27	19	2,276
1987	20	11	1,651

Upper Yukon River (Hess Creek to Dall River) subsistence salmon fishery

Year	No. of Permits Issued	No. Reporting Catches b	Chinook	Chum	Coho
1974	29	c	591	1,857	1,271
1975	19	c	727	778	70
1976	28	18	531	974	-
1977	38	c	467	2,567	-
1978	57	c	1,333	9,735	-
1979	55	41	2,194	12,374	-
1980	70	67	1,350	6,488	36
1981	57	24	1,095	12,034	-
1982	64	44	1,935	11,328	20
1983	68	46	2,672	15,059	-
1984	67	54	4,676	27,869	399
1985	55	42	2,618	21,832	33
1986	76	58	3,827	18,690	759
1987	58	47	3,492	29,734	64

Upper Yukon R. (22 Mi Slough to U.S./Canada border) subsistence salmon fishery

Year	No. of Permits Issued	No. Reporting Catches b	Chinook	Chum	Coho
1979	75	60	4,063	30,475	114
1980	48	39	3,649	18,477	6
1981	71	51	4,510	38,333	-
1982	60	61	3,833	15,432	-
1983	53	52	2,831	23,708	-
1984	58	54	2,543	21,675	17
1985	59	36	2,419	19,059	2
1986	40	52	4,148	20,701	43
1987	53	60	3,634	29,864	0

a Personal use fishery established only for fall chum salmon in 1987.
b Some fishermen reporting catches did not have permits.
c Information not available.

Appendix Table 33. Comparative Yukon River chinook salmon escapement estimates, 1972-1987. a

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Andreafsky River																
East Fork	798	825	--	993	818	2,008	2,487	1,180	958 b	2,146 c	1,274	2,720 d	2,473 d	1,617	1,954	1,608 p
West Fork	582 b	788	285	301	643	1,499	1,062	1,134	1,500	231 b	851	--	1,993	2,248	3,158	3,281
Total	1,380	1,613	285 b	1,294	1,461	3,507	3,549	2,314	2,458	2,377 b	2,125	2,720 b	4,466	3,865	5,112	4,889
Anvik River Drainage																
Tower Count	1,104	517	471	548	958	1,261	1,088	1,247	--	--	--	--	--	--	--	--
Below Tower Site (incl trib)	94 e	96 b	--	182 e	195 e,f	118	236	237	--	--	--	--	--	--	--	--
Total	1,198	613	471 b	730	1,153	1,371	1,324	1,484	1,330	807 b	--	633 b	641 b	1,051	1,118	1,174 b
Nulato River																
North Fork (incl main river)	--	--	55 b	123	471	286	498	1,093	934	--	--	526	--	1,600	1,452	1,145
South Fork	--	--	23 b	81	177	201	422	414	369	791	--	480	--	1,180	1,522	493
Total	--	--	78 b	204	648	487	920	1,507	1,323	791 b	--	1,006 b	--	2,780	2,974	1,638
Gisasa River	--	--	161	385	332	255	45 b	484	951	--	421	572	--	735	1,346	731
Tozitna River	--	--	--	202	42 b	123	194	--	257	--	91	380	--	86	222	--
Chena River	138 b,e	21	1,035 e	916 e	531	563	1,726	1,139	2,541	600 b	2,073	2,553	801	2,553	2,031 g	1,312 q
Salcha River	1,193	391	1,857	1,055	1,641	1,202	3,499	4,789	6,757	1,237 b	2,334	1,961	1,031	2,035	3,360	1,898 r
Tatchun Creek h,i	80	99 j	192 j	175 j	52 j	150 j	200 e,j	150 j	222 j	133 j	73 j	264 j	161	190	155 j	159 j
Little Salmon River h	126	27 b	--	--	--	171	330	489 b	286 b	670	403	101 b	434	255 j	54 b,j	468 j
Big Salmon River h																
Big Salmon Lk - Scurvy Cr	112	23 b	--	153	--	--	--	558	470	930	174	189	228	202	306	379
Scurvy Cr - vicinity Souch Cr	303 j	52 b	--	--	--	--	--	77	966	1,481	584	351	816	599	439	512
Total	415	75 b	70 b	153 b	86 b	316 b	524 b	632	1,436	2,411	758	540	1,044	801	745 k	891 s
Nisutlin River Drainage h																
Sidney Cr - 100 Mile Cr	237	36 b		249	102	77	375	713	975	1,626	578	701	832	409	459 b	183
McNeil Ri - Nisutlin Lk	48	6 b		88	50	--	109	--	400	168	97	187	223	96	148	38
Wolf Ri (Wolf Lk - Rad Ri)	13 j	--	--	40 b,j	--	--	--	183 b	377 j	395	184	95	124	110	109	35
Total	298	42 b	150 b,j	377 b	152 b	77 b	484 b	896 b	1,752	2,189	779	903	1,178	615	716	256
Whitehorse Dam (Fishway Counts) h	391	224	273	313	121	277	725	1,184	1,383	1,539	473	905	1,042 l	508 m	557 n	327 t
Canadian Yukon Mainstem (Tagging) o	--	--	--	--	--	--	--	--	--	--	20,200	29,500	--	18,800	17,500	13,493

a Data obtained from aerial surveys unless otherwise indicated. Only peak estimates are listed.
b Incomplete or poor survey conditions resulting in a very minimal count.
c Bendix sonar estimate was 5,349.
d Bendix side scan sonar estimate.
e Boat survey.
f Also includes 93 chinook observed in the Yellow River.
g Peterson population estimate was 9,065 chinook salmon.
h Yukon Territory streams.
i Foot survey.
j Canadian (DFO) data.
k The DFO weir count was 1,816 chinook salmon.
l Includes 65 chinook salmon taken for hatchery brood stock.
m Includes 98 chinook salmon taken for hatchery brood stock.
n Includes 150 chinook salmon taken for hatchery brood stock of which 90 died.
o Estimated total escapement to Canada (excluding Porcupine R.) from DFO tagging project.
p Tower count was 2,011 chinook salmon.
q Petersen population estimate was 6,404 chinook salmon.
r Petersen population estimate was 5,060 chinook salmon.
s The DFO weir count was 998 chinook salmon.
t Includes approximately 100 chinook salmon taken for hatchery brood stock.

Table 34. Comparative Yukon River summer chum salmon escapement estimates 1974-1987. a

		1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Andreafsky River															
East Fork		3,215 b	229,485	105,347	112,722	127,050	66,471	36,023 b	81,555 c	7,501 b,d	110,668 c	70,125 c	66,146	167,614 f	43,221 f
West Fork		33,578	235,954	118,420	63,120	57,321	43,391	113,457	--	7,267	--	230,565	52,750	99,373	31,998
	Total	36,793 b	459,439	223,767	175,842	184,371	109,862	152,280	--	14,768 b	--	300,690	118,896	266,987	77,219
Anvik River Drainage															
Tower Count		201,277	601,880	237,851	162,614	166,102	37,457	--	--	--	--	--	--	--	--
Below Tower Site g			211,130	168,315	100,240	85,237	--	--	--	--	--	--	--	--	--
Above Tower Site g			634,355	243,695	--		94,620	--	--	--	--	--	--	--	--
Subtotal		--	845,485	412,010	100,240	85,237	--	--	--	--	--	--	--	--	--
	Total	201,277 b	845,485	406,166	262,854	251,339	280,237 e,h	492,676 e	1,479,582 e	444,581 e	362,912 e	891,028 e	1,000,243 e	1,189,602 e	455,876 e
Rodo River		16,137	25,335	38,258	16,118	17,845	--	--	--	--	--	--	24,576	--	--
Hulato River															
North Fork (incl main river)		22,144	87,280	30,771	58,275	41,639	35,598	11,244 b	--	--	19,749	--	19,944	47,417	7,163
South Fork		29,016	51,215	9,230 b	11,585	12,821	1,506	3,702 b	14,348	--	1,269 i	--	10,494	16,848	4,094
(best estimate)	Total	51,160	138,495	40,001	69,660	54,480	37,104	14,946 b	--	--	21,012 b	--	29,038	64,265	11,257
Gisasa River		22,022	56,904	21,342	2,204 b	9,280 b	10,962	10,388	--	334 j	2,356 b	--	13,232	12,114	2,123
Hogatza River															
Clear Creek		--	7,610	9,356	6,437	2,716	5,132	12,375	--	4,190 j	14,651	--	8,072	--	2,725 i
Caribou Creek		--	14,745	11,388	4,297	2,386	9,089	7,411	--	786 j	14,090	--	14,494	--	2,944 i
	Total	--	22,355	20,744	10,734	5,102	14,221	19,786	--	4,984 b	28,141	--	22,566	--	5,669
Toxitna River		1,823	3,512	725 b	761	2,262	--	588	--	874	1,604	--	1,030	1,778	--
Chena River		4,349 k	2,380 k	685	610	1,609	1,025 b	338	3,500	1,509	1,097	1,861	1,005	1,509	333
Salcha River		3,510	7,573	6,484	677	3,405	3,060	4,140	8,500	3,756	716	9,810	3,178	8,028	3,657

a Data are peak aerial survey estimates rated fair to good unless indicated otherwise.
b Incomplete or poor survey conditions resulting in minimal count.
c Sonar estimate was 147,312.
d Sonar estimate was 180,078.
e Bendix side scan sonar estimate.
f Tower count.
g Includes tributaries
h Count includes 277,712 sonar estimate plus 2,825 below sonar site.
i Surveyed too early.
j Surveyed too late.
k Boat survey.
l Surveyed too late resulting in low count.

Table 35. Comparative Yukon River fall chum salmon escapement estimates to selected index areas, 1973-1987. a

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
TANANA RIVER DRAINAGE															
Upper Toklat River b	6,957	34,310	42,418 e	35,190	21,800 e	35,000	96,550 d	23,054	13,907	3,309 e	13,105 e	13,861	21,824 d	12,708 d	18,350 d,u
Lower Toklat River	--	--	35,867 e	(2,000) d	--	--	64,340	(2,140)	--	--	--	--	--	--	2,220
Upper Tanana River															
Benchmark #735 Slough	127	1,450 e	--	336	1,270	1,705 e	2,714	1,900 e	168 e	--	--	--	1,093	--	--
Delta River	7,971 f	4,010	3,734 h	6,312 h	16,876 h	10,051	8,125	4,637	22,375 e,g	3,433 e	7,230 e	12,327 e	17,276 h	6,703 h	21,180 h
South Bank Tanana i	3,635	4,567 f	--	4,979	3,797	3,760	20,820	3,444	7,063	--	1,350 e	2,150	975 e	1,418 e	--
Bluff Cabin Slough	3,450	4,840 f	5,000 e,d	3,197	6,491	3,240	6,875	3,190	6,120	1,156 e	12,715 e	4,017 e	2,655	3,458 e	9,395 e
One Mile Slough	1,720	1,235	745 d	1,552	1,900	475	3,850 e	883 e	632	--	1,115 e	560 e	366 e	1,949	2,500 e,v
Subtotal	18,903	16,102	9,479 j	16,376	30,334	23,271	42,384	14,056	36,358	4,589 j	22,410 j	19,054 j	22,365	13,720 j	33,075 j
Total Tanana Index	25,860	50,412	87,764 j	51,566	52,134	58,271	203,474	37,110	50,265	7,898 j	37,515 j	34,915 j	44,189	26,428	53,645 j
CHANDALAR RIVER	--	17,455	6,345 e,j	58 e,j	4,183	--	--	2,607	4,906 e,j	1,145 e	--	--	2,335 p	39,313 p,l	52,416 p,l
PORCUPINE RIVER DRAINAGE															
Sheenjek River	1,175 f,k	40,507	78,060	11,866	20,506	14,610 e	41,140	13,027	74,560 l	31,421 l	49,392 l	27,130 l	152,768 l	83,197 l	140,086 l
Fishing Branch River (YT)	15,987 m	31,525 m	353,282 m	13,450	32,500	15,000	44,000	20,319 e	10,549 j	9,846	10,000	9,570	56,016 m	31,173 m,r	48,956 m
Total Porcupine River	17,162 n	72,032 n	431,342 n	25,316	53,006	29,610	85,220	33,346	85,109 n	37,267 n	59,392 n	32,700 n	208,784 n	114,370 n	189,042 n
UPPER YUKON TRIBUTARIES															
Kluane River (YT)	2,500	350 j	362 e,f	20 f	3,555	0 f	4,640 e	3,150	25,806	5,378 e	8,578 e,j	7,200	7,538	16,686	12,000
Yukon River (YT) q	--	--	7,671	--	--	--	--	--	250 j	1,020	7,560	2,800	10,760	825	6,115
Total Yukon (YT)	2,500	350	8,033	20	3,555	0	4,640	3,150	26,056	6,398	16,138	10,000	18,298	17,511	18,115
Mainstem Yukon Canada (Tagging) s	--	--	--	--	--	--	--	--	--	34,000	89,000	--	59,000	88,000	80,879

a Data are peak aerial survey estimates rated fair to good unless otherwise indicated.
b Includes following areas: Toklat River in vicinity of Knights Roadhouse; Sushana River; Geiger Creek. Lower Toklat River counts are included in Total Tanana River Index for years 1975, 1979 and 1987.
c Poor survey.
d Combined aerial and ground surveys.
e Ground surveys.
f Survey rating not given.
g Peak aerial count was 10,664.
h Population estimate based upon replicate ground surveys.
i Richardson Highway to Blue Creek
j Incomplete, partial survey of index area(s).
k Surveyed too early.
l Bendix side scan sonar estimate. (For Sheenjek River -- includes expansion for uninsonified mid-river zone).
m Weir counts.
n Figure includes sonar or weir estimate and is not comparable on a year to year basis.
o Fair to poor survey rating.
p USFWS estimates.
q Vicinity of Ft Selkirk to Carmacks.
s Estimated total escapement to Canada (excluding Porcupine River) from DFO tagging project.
t Population estimate for upper Toklat River area was 18,903 fall chum salmon.
u Population estimate for upper Toklat River area was 22,141 fall chum salmon.
v These fish were observed in lower one mile of Delta Clearwater River (One Mile Slough not surveyed).

Appendix Table 36. Yukon River fall chum salmon harvest, escapement to four selected spawning areas, total return index, and maximum exploitation rate, 1974-1987.

	Alaska a			Canada b			Entire River					Maximum
Year	Comm	Subs	Total	Comm	Subs	Total	Comm	Subs	Total	Escapement Index c	Index of Return d	Exploit Rate e
1974	289,776	93,776	383,552	2,544	9,102	11,646	292,320	102,878	395,198	171,890	567,088	0.6969
1975	275,009	86,591	361,600	2,500	18,100	20,600	277,509	104,691	382,200	621,371	1,003,571	0.3808
1976	156,390	72,327	228,717	1,000	4,200	5,200	157,390	76,527	233,917	123,132	357,049	0.6551
1977	257,986	82,771	340,757	3,990	8,489	12,479	261,976	91,260	353,236	187,282	540,518	0.6535
1978	247,011	94,867	341,878	3,356	6,210	9,566	250,367	101,077	351,444	121,442	472,886	0.7432
1979	378,412	233,347	611,759	9,084	13,000	22,084	387,496	246,347	633,843	399,252	1,033,095	0.6135
1980	298,450	172,657	471,107	9,000	13,218	22,218	307,450	185,875	493,325	115,711	609,036	0.8100
1981	477,736	188,525	666,261	15,260	7,021	22,281	492,996	195,546	688,542	171,229	859,771	0.8008
1982	224,992	132,897	357,889	11,312	4,779	16,091	236,304	137,676	373,980	55,158	429,138	0.8715
1983	307,662	192,930	500,592	25,990	3,500	29,490	333,652	196,430	530,082	105,104	635,186	0.8345
1984	210,560	174,823	385,383	22,932	6,335	29,267	233,492	181,158	414,650	71,202	485,852	0.8534
1985	270,269	206,472	476,741	35,746	5,519	41,265	306,015	211,991	518,006	248,949	766,955	0.6754
1986	140,019	164,034	304,053	11,464	3,072	14,536	151,483	167,106	318,589	139,976	458,565	0.6948
1987	0	245,834	245,834	40,341	3,904	44,245	40,341	249,738	290,079	232,363	522,442	0.5552
1982-86 AVERAGE	230,700	174,231	404,932	21,489	4,641	26,130	252,189	178,872	431,061	124,078	555,139	0.7859

a Alaska commercial harvest includes "equivalent fish" converted from roe sales.

b Canadian subsistence includes the Indian food and domestic fisheries. Commercial and subsistence harvest data are preliminary for 1987.

c Escapement index is the sum of total season escapement to the Sheenjek, Fishing Branch, upper Toklat, and Delta Rivers. Sonar counts, weir counts, or multiple surveys and stream life factors were used where possible. Other historic survey count data for these spawning areas were expanded to population estimates based on these data. This is only an index of escapement because several known fall chum salmon spawning areas are not included, due to the lack of an adequate historical data base.

d Sum of entire river commercial harvest, subsistence harvest, and the escapement index. This is only an index of total return since not all spawning populations are included in the escapement index.

e Sum of entire river commercial and subsistence harvest divided by the index of total return. This is a maximum estimate of harvest exploitation rate since the escapement index is a minimum estimate.

Table 37. Comparative Yukon River coho salmon escapement estimates, 1972-1987. a

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Nenana River																
Lost Slough	--	--	1,388	943	118	524	350	227	492	274	--	766	2,677	1,584	794	2,511
Clear Creek	--	--	--	--	13	--	--	--	--	--	--	--	2,600 b,e	--	605 b,e	--
Wood Creek b	--	--	--	--	--	310 d	300 d	--	1,681 d	849 e	1,436 e	1,844 e	8,805 e	3,775 e	1,664 e	2,450 e
Seventeen Mile Slough	--	--	27	956	281	1,167	466	1,987	592	1,005	--	193	--	2,081	218 b,e	3,802
Subtotal Nenana River	--	--	1,415	1,899	412	2,001	1,116	2,214	2,694	2,128	1,436	1,913	14,082	7,440	3,281	8,763
Delta Clearwater River e,f	632	3,322	3,954	5,100	1,920	4,793	4,790	8,970	3,946	8,563 g	8,365 g	8,019 g	11,061	9,350	10,857	22,300
Clearwater Lake and outlet	417	551 f	560	1,575 e,f	1,500 e,f	730 e,f	570 e,f	1,015 e,f	1,943 e,f	439 h	--	253	1,560	750	3,377	4,225 e,f
Richardson Clearwater River	454 h	375 f	652 f	4 h	80 h	327	--	372	611	550	--	88	428	--	146 h	--

a Peak aerial survey estimates rated fair to good unless otherwise indicated.
b F.R.E.D. Division data.
c Boat survey.
d Foot survey.
e Weir count
f Sport Fish Division survey
g Population estimate.
h Poor or incomplete survey.

Appendix Table 38. Associated environmental and salmon catch data, Yukon River, 1961-1987.

Year	Average Nome April Air Temp. (F)	Tanana River Nenana Ice Breakup	Icecut Yukon Delta Area	First Chinook Caught Delta Area b	First Chinook Caught Kuskokwim River b	First Chinook Caught Dist. 1 Comm. Fishery	First Summer Chum Caught Delta Area b	First Summer Chum Caught Dist. 1 Comm. Fishery
1961	18	5/05	a	6/05	a	6/05	a	-
1962	18	5/12	6/10	6/07 c	a	6/11	a	-
1963	18	5/05	5/29	a	a	6/03	a	-
1964	13	5/20	>6/12	a	a	6/15	a	-
1965	20	5/07	6/01	6/06	5/31	6/07	a	-
1966	15	5/08	6/06	6/09	5/27 g	6/10	a	-
1967	23	5/04	a	5/20	5/20	6/02	5/30	6/09
1968	14	5/08	a	a	5/26	6/03	6/05	6/07
1969	22	4/28	5/25	5/26	5/23	6/02	6/02	6/02
1970	15	5/04	late May	6/06	5/21	6/06	6/05	6/11
1971	13	5/08	6/05	6/11	6/06	6/11	6/15	6/15
1972	12	5/10	6/03	6/09	6/05	6/09	6/11	6/10
1973	18	5/04	6/01	5/30 d	5/27	6/05	6/05	6/07
1974	21	5/06	late May	5/27	5/23	6/03	6/01	6/03
1975	13	5/10	6/01	6/01	5/26	6/09	6/13	6/13
1976	10	5/02	6/01	6/12	6/01	6/14	6/13	6/14
1977	9	5/06	6/01	6/09	5/31	6/11	6/11	6/13
1978	25	4/30	5/20	5/26	5/18	6/08	5/26	6/08
1979	26	4/30	5/20	5/24	5/16	6/04	5/28	6/04
1980	24	4/29	5/19	5/27 e	5/17	6/09	5/31	6/09
1981	24	4/30	5/18	5/25	5/22	6/05	5/28	6/05
1982	12	5/10	6/02	6/06	6/01	6/14	6/06	6/14
1983	25	4/29	5/21	5/25	5/23	6/09	5/30	6/09
1984	12	5/09	6/01	6/02 f	5/25	6/18	6/08	6/08
1985	1	5/11	6/05	6/14	6/03	6/24	6/16	6/24
1986	12	5/08	6/01	6/06	5/29	6/14 h	6/07	6/14
1987	19	5/05	5/31	5/31	5/24	6/15	6/04	6/15

a Information not available.
b Subsistence or test net fishery.
c Caught 6/09 Mt. Village, back calculated arrival date to mouth.
d Caught 6/03 Pilot Station, back calculated arrival date to mouth.
e Caught 5/23 Marshall, back calculated arrival date to mouth.
f Caught 6/05 Pitkas Point, back calculated arrival date to mouth.
g Caught 6/01 Kaiskag, back calculated arrival date to mouth.
h Special six inch maximum mesh size fishing period.

Appendix Table 39. Total catch and estimated catch of Western Alaska (including Canadian Yukon) chinook salmon (in thousands of fish) taken in Japanese high seas salmon gill net fisheries and total catch of chinook salmon taken in foreign and joint-venture trawl fisheries, 1964-1987.

	Japanese Mothership Gillnet		Japanese Landbased Driftnet		Japanese Total Gillnet		Bering Sea-Aleutian Area Trawl			Gulf of Alaska Trawl		
	Western Alaska		Western Alaska		Western Alaska			Joint			Joint	
Year	Origin	Total	Origin	Total	Origin	Total	Foreign	Venture	Total	Foreig	Venture	Total
1964	179	410	40	208	219	618						
1965	106	185	20	102	126	287						
1966	108	208	22	118	130	326						
1967	71	128	22	115	93	243						
1968	244	362	18	97	262	459						
1969	367	554	17	88	384	642						
1970	312	437	28	148	340	585						
1971	132	206	27	139	159	345						
1972	189	261	20	107	209	368						
1973	56	119	31	165	87	284						
1974	208	361	36	188	244	549						
1975	108	162	20	137	128	299						
1976	117	285	42	201	159	486						
1977	55	93	31	146	86	239				4.8		4.8
1978	36	105	63	210	99	315	39.1		39.1	a		
1979	69	126	45	160	114	286	100.4		100.4	16.9	1.0	17.9
1980	416	704	22	160	438	864	113.2	1.9	115.1	31.6	0.2	31.8
1981	30	88	55	190	85	278	36.7	0.3	37.0	28.6	0.0	28.6
1982	45	107	41	165	86	272	13.9	1.7	15.6	a	3.5	5.9
1983	31	87	44	178	75	265	9.8	0.5	10.3	5.9	9.4	9.4
1984	37	82	b	92	b	174	a	a	b	11.1	63.2	74.3
1985	25	66	b	100	b	166	b	b	b	0.3	13.6	13.6
1986	24	60	b	77	b	137	0.3	4.0 c	4.3	b	18.0	18.0
1987	20	39	b	77	b	116	b	b	b	b	b	b

a Species composition unknown.

b Information not available.

c Longline harvest only, no trawling conducted in 1986.

Appendix Table 40. Commercial herring fishing data, Cape Romanzof District, 1980-1987.

	1980	1981	1982	1983 a	1984	1985	1986	1987
Catch (st)	611	720	657	816	1,185	1,299	1,865	1,342
Hours Fished	312	130	180	144	90	90	42	8
Percent Roe Recovery	9.8	8.0	9.3	9.0	8.6	8.3	9.2	8.9
Estimated Value ($ millions)	0.13	0.21	0.22	0.37	0.31	0.55	1.14	1.00
Number of Buyers	2	4	2	3	3	2	5	9
Number of Fishermen	69	111	75	63	66	73	97	157
Percent Effort by Local Fishermen	70	81	85	92	98.5	91	84	53
Percent Harvest by Local Fisherme	40	60	84	88	99.8	94	70	33
Biomass Estimate b	3,000	4,900	4,900	5,500	6,100	7,000	7,500	7,200
Exploitation Rate	20.4	14.7	13.4	14.8	19.4	18.6	24.9	18.6

a Exclusive Use Regulation into effect.
b Biomass estimates from 1980 to 1986 were qualitative estimates of herring abundance to describe abundance trends. Biomass estimate for 1987 was by aerial survey.

Appendix Table 41. Subsistence herring harvest (st) and effort data, Cape Romanzof, 1975-1987. a

Year	Scammon Bay	Chevak	Hooper Bay	Total	Number of Fishing Families
1975	-	-	3	3	34
1976	1	1	3	5	41
1977	-	<1	2	<3	30
1978	1	-	4	5	29
1979	6	2	3	11	84
1980	3	4	4	11	61
1981	8	2	4	14	46
1982	4	2	5	11	43
1983	3	1	5	9	37
1984	4	3	4	11	47
1985	2	2	4	8	44
1986	2	1	4	7	41
1987	1	1	1	3	39

a Subsistence survey results are believed to accurately reflect harvest trends, however, reported catches reflect minimum figures since all fishermen cannot be contacted.

Appendix Table 42. Colville River commercial whitefish catches, 1964-1987.

Year	Broad Whitefish	Humpback Whitefish	Arctic Cisco ("kaktok")	Least Cisco ("herring")
1964	2,951 a		16,000	9,000
1965	3,000 a		50,000	
1966	2,500 a		40,000	
1967	data not available			
1968	3,130		42,055	18,180
1969	data not available			
1970	2,080 a		19,602	25,930
1971	3,815	132	38,016	22,713
1972	3,850	1497	37,333	13,283
1973	2,161		71,569	25,188
1974	3,117	2,316	35,601	13,813
1975	2,201	1,946	28,291	20,778
1976	2,172	1,815	31,659	34,620
1977	443	1,431	31,796	14,961
1978 b	20 c	1,102	17,292	21,589
1979	c	1,831	8,684	24,984
1980	c	4,231	14,657	31,459
1981	1,035	469	38,206	16,584
1982	1,662	201	15,067 d	25,746 d
1983	c	408 c	18,162	35,322
1984	789	179	27,686	13,076
1985	401	191	23,679	17,595
1986 e	0	18	29,895	9,444
1987 e	5	1,989	24,769	10,922

a Includes small numbers of humpback whitefish.
b Also reported taken were 1 chinook, 2 sockeye, 9 chum, and 118 pink salmon.
c No fishing effort during June or July.
d No fishing effort during November or December.
e No fishing effort during July or December.

Average weights: Broad whitefish 5.1 lbs.
Least cisco 0.9 lbs.
Arctic cisco 1.0 lbs.

Appendix Table 43. Commercial freshwater fishery catches, Upper Yukon area, 1971-1987.

	Healy Lake		Lake Minichumina		Tanana River		
	Whitefish		Whitefish		Burbot		Whitefish
Year	Number	Pounds	Number	Pounds	Number	Pounds	Number
1971			3,277	9,831			
1972	2,605	3,950	718	2,154			
1973	2,187	3,915	1,697	5,037			
1974	1,885	3,390	854	2,562			
1975	1,357	2,375					
1976	1,440	2,625					
1977	-	-					
1978	-	-					
1979	1,336	2,306					
1980	data unavailable						
1981	no effort						
1982	no effort						
1983	no effort						
1984	no effort				-	76	
1985	no effort						
1986	no effort						72
1987	no effort						

Appendix Table 44. Commercial freshwater fishery catches, lower Yukon area, 1978-1987.

	Sheefish		Whitefish		Blackfish	Burbot		Pike	Lamprey
Year	Number	Pounds	Number	Pounds	Pounds	Number	Pounds	Pounds	Pounds
1978	-	-	19	87	-	-	-	-	-
1979	5	39	23	55	-	-	-	-	-
1980	283	2,265	78	250	293	-	-	-	-
1981	299	2,812	779	2,875	-	-	-	9	-
1982	754	6,161	1,633	6,214	-	102	482	-	-
1983	395	2,692	163	648	-	-	-	-	-
1984	94	762	794	2,362	-	-	-	-	-
1985	358	3,081	1,514	4,586	-	-	-	-	-
1986	-	-	1,533	5,845	-	-	-	-	80
1987	-	-	2,144	7,564	-	-	-	-	-

Attachment 1. List of lower Yukon Area Emergency Orders, 1987.

E.O. Number	Date	Action Taken	Comments
3-LY-01-87	May 23	Established the first Cape Romanzof District commercial herring fishing period beginning 8:00 a.m. May 23 continuing until 11:00 a.m. May 23.	Test and test commercial catch samples as well as spawning ground surveys indicated mature herring available in harvestable numbers.
3-LY-02-87	May 26	Established the second Cape Romanzof District commercial herring fishing period beginning 8:00 p.m. May 26 and continuing until 11:00 p.m. May 26.	Roe quality improved from initial period based on test catch samples.
3-LY-03-87	May 27	Established the third and final Cape Romanzof District commercial herring fishing period beginning 1:00 p.m. May 27 and continuing until 3:00 p.m. May 27.	Herring of good quality available. Harvestable surplus present based on aerial biomass estimate.
3-LY-04-87	June 15	Opened the commercial salmon unrestricted mesh size fishing season effective 6:00 p.m. June 15 in District 1 and 6:00 p.m. June 17 in District 2. Also established two-24-hour fishing periods a week in Districts 1 and 2.	Test fish and subsistence catch data indicated a building run of chinook salmon has been in progress for approximately nine days.
3-LY-05-87	June 21	Opened the commercial salmon unrestricted mesh size fishing season effective 6:00 p.m. June 21 in District 3 of the Yukon Area. Also established two-24-hour fishing periods a week in District 3.	Test fish and subsistence catch data indicated that chinook salmon were present in harvestable numbers in the lower 300 miles of the river.
3-LY-06-87	June 27	Established special 24-hour subsistence fishing periods every other weekend during the commercial salmon fishing season in Districts 1, 2, and 3 through July 15, 1987. Specifically this emergency order opened subsistence fishing from 6:00 p.m. June 27 until 6:00 p.m. June 28 in District 1 and from 6:00 p.m. June 26 until 6:00 p.m. June 17 in Districts 2 and 3.	Special subsistence fishing periods established by emergency order as stipulated by regulation to provide for increased fishing opportunities.

Attachment 1. (continued).

E.O. Number	Date	Action Taken	Comments
3-LY-07-87	June 25	Amended a single scheduled fishing period for District 1 as established by E.O. 3-LY-04-87. Reduced fishing time scheduled to occur from 6:00 p.m. June 25 to 6:00 p.m. June 26 to occur from 6:00 p.m. June 25 to 6:00 a.m. June 26. A reduction in fishing time of 12 hours.	Fishing time reduction required an anticipation of harvest rates, and incidental harvest of chinook salmon during restricted periods to maintain overall chinook harvest within guideline harvest range.
3-LY-08-87	June 28	Amended a single scheduled fishing period for District 2 as established by E.O. 3-LY-04-87. Reduced fishing time scheduled to occur from 6:00 p.m. June 28 to 6:00 p.m. June 29 to occur from 6:00 a.m. June 29 to 6:00 p.m. June 29 a reduction in fishing time of 12 hours.	Same consideration as made in E.O. NO. 3-LY-07-87.
3-LY-09-87	June 29	Established gill net mesh size restriction of six inch or smaller for the taking of salmon for commercial purposes beginning June 29 in District 1, and beginning July 1 in District 2.	A switch over to gill nets of six inch maximum mesh size will direct the harvest toward summer chum salmon.
3-LY-10-87	June 28	Amended a single scheduled fishing period for District 3 as established by E.O. 3-LY-05-87. Reduced fishing time scheduled to occur from 6:00 p.m. June 28 to 6:00 p.m. June 29 to occur from 6:00 a.m. June 29 to 6:00 p.m. June 29. A reduction in fishing time of 12 hours.	Same consideration as made in E.O. No. 3-LY-07-87.
3-LY-11-87	July 1	Established gill net mesh size restriction of six inch or smaller for the taking of salmon for commercial purposes beginning July 1 in District 3.	Some consideration as made in E.O. 3-LY-09-87.
3-LY-12-87	June 29	Prohibited subsistence fishing for salmon by commercial fishermen during open commercial fishing periods with gill nets larger than six inch mesh beginning June 1, and beginning July 1 in Districts 2 and 3.	Action taken to prevent chinook salmon harvested under guise of subsistence from entering commercial market.

Attachment 1. (continued).

E.O. Number	Date	Action Taken	Comments
3-LY-13-87	July 2	Closed the commercial salmon fishing season in District 3 effective 6:00 p.m. Thursday July 2.	Chinook salmon harvest within guideline harvest range and summer chum salmon flesh quality was deteriorating.
3-LY-14-87	July 7	Amended scheduled fishing periods for District 1 and 2 as established by E.O. 3-LY-04-87. The fishing period scheduled for District 1 from 6:00 p.m. July 6 to 6:00 p.m. July 7 was cancelled. A reduction of fishing time of 24 hours in District 1. The fishing period scheduled for District 2 from 6:00 p.m. July 5 to 6:00 p.m. July 6 to 6:00 p.m. July 6 was amended to occur from 12:00 p.m. (noon) July 6 to 6:00 p.m. July 6. A reduction in fishing time of 18 hours.	Summer chum salmon return appears late and below average in abundance.
3-LY-15-87	July 8	Amended scheduled fishing periods of Districts 1 and 2 as established by E.O. 3-LY-04-87 and closed the commercial salmon fishing periods on conclusion of the amended periods. The fishing period scheduled for District 2 from 6:00 p.m. July 8 to 6:00 p.m. July 9 was amended to occur from 12:00 p.m. (noon) July 9 to 6:00 p.m. July 9. A reduction in fishing time of 18 hours for District 2. The fishing period scheduled for District 1 from 6:00 p.m. July 9 to 6:00 p.m. July 10 was amended to occur from 6:00 p.m. July 9 to 6:00 a.m. July 10. A reduction of 12 hours commercial fishing time for District 1. The commercial salmon fishing season was closed effective 6:00 p.m. July 9 for District 2 and 6:00 a.m. July 10 for District 1. Twenty-four hours after each district commercial fishery closure, subsistence fishing was allowed to remain open.	Summer chum salmon return was below average in strength based on commercial catch rates and test net indices. Additionally, spawning ground escapement counts to the Anvik and Andreafsky Rivers indicated escapement objectives would not be achieved.

Attachment 2. List of Upper Yukon area emergency orders issued, 1987.

E.O. Number	Date	Action Taken	Comments
3-N-1-87	May 22	Re-open a portion of the Beaufort Sea coastline to subsistence fishing.	Recently collected information indicates long-standing use of this portion of the coastline by residents of Barrow and Nuiqsuit for subsistence fishing purposes. Compliance with the Alaska statute regarding subsistence fishing requires that this area be re-opened.
UY-1-87	July 7	Restrict the commercial salmon fishing season in District 4 to one-48-hour period per week.	Data from commercial fisheries, test fisheries, and preliminary escapement data indicate a weak run of summer chum salmon. Restriction of the chum fishery is necessary to meet spawning ground requirements.
UY-2-87	July 11	Close the commercial fishing season in subdistricts 5-A, 5-B, and 5-C of District 5.	Based on the estimated cumulative chinook harvest and on anticipated catch rates, it was estimated that the final catch for these areas would approximate 2,900 chinook salmon. This level slightly exceeds the guideline harvest range established by the Board of Fisheries for these areas.
UY-3-87	July 21	Close the commercial fishing season in District 6.	As of July 20, it is estimated that the guideline harvest range of 600-800 chinook salmon has been taken. Accordingly, a closure of the Tanana River commercial fishery is required.

Attachment 2 (continued).

E.O. Number	Date	Action Taken	Comments
UY-4-87	July 20	Close the commercial fishing season in subdistrict 5-D of Distinct 5.	As of July 20, the total commercial chinook harvest in subdistrict 5-D was 515 fish. The guideline harvest range for this area is 300-500 chinook salmon. A closure of the commercial fishery in that area is therefore required.
UY-5-87	July 31	Close the Tanana River between the mouth of the Chena and the mouth of the Salcha River to subsistence fishing.	Aerial survey estimates of chinook salmon abundance in the Salcha River indicate unexpectedly and unacceptably low numbers of spawning chinook salmon. The closure will provide needed protection for Salcha River chinook salmon stocks.
UY-6-87	August 1	Close the commercial fishing season in subdistricts 4-B and 4-C of District 4.	As of this date, the summer chum salmon run in this portion of District 4 is essentially over. In order to afford protection to and allow time to assess the early portion of the fall run, a closure of the commercial fishing season is required.
UY-7-87	August 7	Re-open to subsistence fishing that portion of the Tanana River between the mouths of the Chena and Salcha Rivers.	On July 31, this portion of the Tanana River was closed to subsistence fishing to afford protection to a weak Salcha River chinook salmon run. As of August 7, this run is essentially over and a relaxation of this closure is in order.

Attachment 2 (continued).

E.O. Number	Date	Action Taken	Comments
UY-8-87	August 11	Re-open the commercial fishing season for one-48-hour fishing period in District 6.	An aerial survey of the Salcha River on August 10 indicated that escapement into that river had improved significantly and approached the 1975-1986 average level. A re-opening of the commercial fishery is therefore warranted.
UY-9-87	August 13	Open the commercial fishing season for one-48-hour fishing period in District 6.	A 24-hour commercial fishing period was allowed in the district beginning on August 12; during that period, fishermen harvested approximately 3,300 chum salmon. This catch level suggests that even though the run is in its late stages, commercially harvestable numbers of chums are still present. For this reason, an additional fishing period is scheduled.

Attachment 3. Summary of 1987 Yukon area commercial and personal-use regulated by the Alaska Board of Fisheries during April 1987 meeting in Anchorage.

Section	Action Taken
5 AAC 05.365. YUKON RIVER FALL CHUM SALMON MANAGEMENT PLAN	Re-establish fall chum salmon commercial fishing regulations which were put into effect for the 1986 and 1987 seasons. Reduction of fall chum salmon guideline harvest ranges to 0-160,250 fish, a 50% reduction of the upper end of the guideline harvest range from those in effect prior to 1986. Additionally, established closure of District 1, 2 and 3 fisheries on July 15, and provided the Department authority to establish weekly fishing periods by emergency order in Districts 4, 5 and 6.
5 AAC 77.170 PERSONAL USE SALMON FISHERY.	Establish fall chum salmon as personal-use species. This designation allows fishermen of urban domiciles to harvest fall chum salmon under regulations similar to subsistence fisheries except that fall chum salmon taken for personal-use may be used only for human consumption and bait. In addition, personal-use fishermen are required to possess a resident sport fishing license. The Department shall close the fall chum salmon personal-use fishery before restricting the fall chum salmon subsistence fishery.

Attachment 4. Summary of special projects conducted in the Yukon Area, 1987.

1. LOWER YUKON TEST FISHING

a. Location:

1) Big Eddy Set Net Test Fishing Project: Kwikluak Pass near Emmonak (south mouth of the Yukon River Delta).

2) Middle Mouth Set Net Test Fishing Project: Kawanak and Apoon Passes middle and north mouths of Yukon River Delta).

3) Big Eddy Drift Test Fishing Project: Kwikuak pass near Emmonak (south mouth of the Yukon River Delta).

b. Objectives: To determine run timing, distribution and relative abundance of chinook, summer chum, fall chum and coho salmon in the lower Yukon River using gill nets.

c. Results:

1) Big Eddy Set Net Test Fishing Project:

a) CHINOOK AND SUMMER CHUM SALMON: Index set nets for chinook and summer chum salmon were operated from June 2 to July 15. A total of 2,234 chinook and 3,947 summer chum salmon were captured. The chinook salmon catch was similar to 1981. The mean date (the date on which statistically the central point of the migration passed the test fishery) for chinook salmon and summer chum salmon was calculated to be June 22. Relative abundance of summer chum salmon since 1983.

b) FALL CHUM AND COHO SALMON: Index set nets for fall chum and coho salmon were operated from July 16 until August 28. A total of 1,575 fall chum and 493 coho salmon were taken. Fall chum salmon catches increased substantially from 1984 and 1982 levels and were similar to 1985. Fall chum run timing appeared to be later than average. Coho salmon catches were similar to 1983. Test fishing data indicated mean dates of August 8

and August 20 for fall chum and coho salmon, respectively.

2) Middle Mouth Test Fishing Project:

a) CHINOOK AND SUMMER CHUM SALMON: Index set nets for chinook and summer chum salmon were operated June 4 until July 15. A total of 1,469 chinook and 1,631 summer chum salmon were captured. Chinook salmon catches were very similar to 1986. The mean date of migration was June 28. Summer chum salmon catches were down from 1984 and 1985 levels. The mean date for summer chum salmon was July 1.

b) FALL CHUM AND COHO SALMON: Three index set nets for fall chum and coho salmon were fished from July 16 until August 28. A total of 2,715 fall chum and 493 coho salmon were captured. Fall chum salmon catches decreased significantly from 1986. The coho salmon catch was similar to 1985 and 1986. The mean dates of migration were calculated to be August 7 and August 19 for fall chum and coho salmon, respectively.

3) BIG EDDY DRIFT TEST FISHING PROJECT:

Drift test fishing for chinook salmon was conducted for the first time in 1987. Two stations were established, one on each side of Kwikluak Pass upriver from the set net sites at Big Eddy. One drift was made at each station at approximately high tide. Data was collected from June 3 through June 30. A total of 610 chinook and 336 summer chum salmon were captured in a total of 88 drifts.

There did not appear to be a good relationship between drift and set net CPUE. It was difficult to interpolate data for drifts missed during commercial fishing periods. Both projects indicated similar run timing for chinook salmon.

2. UPPER YUKON RIVER TEST FISHING

a. Location: North bank of Yukon River approximately 21 miles upstream from Ruby.

b. Objectives: To determine run timing and relative abundance of fall chum and coho salmon at the Ruby location.

c. Results: The Ruby area north bank test fishwheel was run from August 4 through September 21. During that time, a cumulative total of 4,549 chum salmon was caught and the timing was bimodal with peaks occurring during the periods August 15 - 20 and September 7 through September 10.

3. YUKON RIVER SONAR

a. Location: River mile 123, approximately one mile upstream of Pilot Station.

b. Objectives: The primary objective of this project is to hydroacoustically estimate the number of salmon, by species, passing river mile 123.

c. Results: Sonar was operational on both banks of the Yukon River between 8 June and 6 September in 1987. Fish counts totaled 1,634,528 of which 77% were detected migrating along the south shore and 23% were detected along the north shore of the river. Four mesh sizes of gill net were fished throughout the season to give data for development of species composition estimates. Preliminary results indicate passage of 118,511 chinook salmon, 687,934 summer chum salmon, 586,586 fall chum salmon, 241,497 coho salmon, and 97,615 other species (primarily whitefish, burbot, and sheefish).

4. SUBSISTENCE SALMON FISHERY SURVEYS

a. Location: Yukon, Koyukuk and Tanana Rivers, Yukon Territory villages, and Yukon River Delta coastal communities.

b. Objectives: Determine subsistence utilization of salmon and fishing effort needed for formulating future management procedures and goals.

c. Results: An estimated 1,235 fishing families in the Yukon River drainage harvested an estimated total of 59,450 chinook, 275,914 summer chum, 249,738 fall chum and 48,603 coho salmon. Catch and effort information was obtained by personal interviews and catch questionnaires. Yukon Territory subsistence catch data was furnished by Government of Canada-Department of

Fisheries and Oceans (Whitehorse).

5. COMMERCIAL AND SUBSISTENCE SALMON CATCH SAMPLING

a. Location: Emmonak, St Marys, Marshall, Galena, Rampart, Nenana, and Fairbanks.

b. Objectives: Obtain age, sex, and size composition estimates for salmon harvests in the major commercial and subsistence fisheries on an in-season and post-season basis. Also, provide scale samples of chinook and chum salmon to the stock identification research projects for catch allocation of these species to stock of origin based on scale patterns analysis.

c. Results: Approximately 5,000 chinook salmon, 2,500 summer chum salmon, and 2,000 fall chum salmon (subsistence only) were sampled from fishery harvests in 1987. Preliminary age and sex composition estimates for the lower river commercial fishery were obtained on an in-season basis for harvest regulation purposes. Samples from upper river fisheries were aged on a post-season basis. Age, sex, and, size composition data are being compiled and are not yet available.

6. CHINOOK SALMON STOCK BIOLOGY

a. Location: Commercial and subsistence fishery catch samples were obtained from Districts 1, 2, 4, 5, and 6, and test fishery catch samples were obtained from District 1 as outlined in catch sampling and test fishing project summaries. Escapement carcass samples were collected from the Andreafsky, Anvik, Nulato, Gisasa, Henshaw Creek, Jim, South Fork Koyukuk, Chandalar, Clear Creek, Chena, and Salcha Rivers in Alaska, and from the Nisutlin, Big Salmon, Little Salmon, Tatchun Creek, Teslin, Morely, Nordenskjold, and mainstem Yukon Rivers in Yukon Territory. Additional catch and escapement samples from the Yukon Territory were provided by the Canadian Department of Fisheries and Oceans.

b. Objectives: Allocate Yukon River commercial and subsistence chinook salmon harvests to stock region of origin by fishing district and time period based on scale patterns analysis. Assess the quality of spawning escapements in terms of potential productivity, and monitor the effects of harvest management strategy on spawning escapements by stock.

c. Results: All escapement samples and those catch samples

not aged during the season were aged on a post-season basis. Age, sex, and size composition data are being compiled, and are not yet available. Scale patterns from approximately 2,000 chinook salmon catch and escapement samples were analyzed using a computer based digitizing station. These scale measurements will be used to build stock identification models for allocation of the Yukon River fishery harvests to stock region of origin. These data are not yet available.

7. CHUM SALMON STOCK BIOLOGY

a. Location: Commercial and test fishery catch samples were obtained from Districts 1 and 4, and subsistence fishery samples from District 5 as outlined in catch sampling and test fishing project summaries. Escapement samples were collected from the Andreafsky, Anvik, Nulato, Gisasa, and Koyukuk Rivers for summer chum salmon, and from the Chandalar, Sheenjek, Toklat, Bluff Cabin Slough, and Delta Rivers for fall chum salmon in Alaska. Additional fall chum salmon catch and escapement samples from the Yukon Territory were provided by the Canadian Department of Fisheries and Oceans.

b. Objectives: Investigate the feasibility of discriminating stocks or stock groupings of Yukon River fall chum salmon based on scale patterns analysis. If feasible, then allocate Yukon River District 1 commercial and test fishery catches and the District 4 test fishery catch to stock region of origin based on scale patterns analysis.

c. Results: All catch and escapement samples not aged during the season were aged on a post-season basis. Age, sex, and size composition data are being compiled, and are not yet available. Chum salmon scale patterns from escapement samples were analyzed using a computer based digitizing station. These scale measurements will be used to build stock identification models for allocation of the Yukon River fishery harvests to stock region of origin if justified by the levels of accuracy and precision that can be obtained. These data are not yet available.

8. ANDREAFSKY RIVER SALMON ESCAPEMENT STUDY

a. Location: River mile 20 of the East Fork Andreafsky River.

b. Objectives: Enumerate summer chum, chinook, and pink salmon escapement to the East Fork Andreafsky River on a daily basis by visually counting fish passage from a counting tower. Collect chum and chinook salmon samples by beach seine for age, sex, and size composition estimates. Additional chinook salmon samples are collected by carcass survey under the Chinook Salmon Stock Biology Project.

c. Results: Salmon escapement counting was conducted from 25 June through 25 July. The season total escapement estimate was 45,221 summer chum salmon, 2,011 chinook salmon, and 676 pink salmon. The summer chum salmon estimate was the smallest total season count recorded for this stream since the study was initiated in 1981, and was 67% below the 1981-1986 average escapement count (excluding 1985) of 135,400 fish. The chinook salmon escapement estimate exceeded the incomplete estimate of 1,530 fish in 1986, and the aerial survey objective of 1,100 to 1,600 fish. Pink salmon are more abundant in even numbered years.

Chum salmon age composition for 362 ageable samples was 67% age 5, 29% age 4, 4% age 6, and 0.8% age 3. Females accounted for 59% of the sample. Chinook salmon age composition for 383 ageable samples was 84% age 6, 9% age 5, 5% age 4, and 2% age 7. Females accounted for a relatively high proportion (56%) of the sample.

9. ANVIK RIVER SALMON ESCAPEMENT STUDY

a. Location: River mile 48 of the Anvik River.

b. Objectives: Enumerate summer chum salmon escapement to the Anvik River on a daily basis using side-scanning sonar. Collect chum and chinook salmon samples by beach seine for age, sex, and size composition estimates. Additional chinook salmon samples are collected by carcass survey under the Chinook Salmon Stock Biology Project.

c. Results: Salmon escapement counting was conducted from 21 June through 26 July. The season total escapement estimate was 455,876 summer chum salmon. This estimate was 26% greater than the parent year escapement in 1983, but was 6% below the escapement objective of 487,000 fish, and 27% below the long term (1972- 1986) average escapement of 628,000 fish.

Chum salmon age composition for 545 ageable samples was 66% age 4, 29% age 5, 3% age 6, and 2% age 3. Females

accounted for 65% of the sample. Chinook salmon age composition for 222 ageable samples was 74% age 6, 13% age 5, 9% age 4, and 4% age 7. Females accounted for 59% of the sample.

10. SHEENJEK RIVER ESCAPEMENT STUDY

a. Location: Rivermile 6 of the Sheenjek River (Porcupine River drainage).

b. Objectives: Determine timing and magnitude of salmon escapement to the Sheenjek River and collect salmon age, sex, and size information from a sampled portion of the run.

c. Results: The sonar-estimated escapement to the Sheenjek River in 1987 was 140,086 fall chum salmon for the period 25 August to 24 September. The mean date of run passage was 10 September.

The chum salmon sex ratio was 34% males and 66% females based upon beach seine samples collected late in the run. Overall age composition as determined from vertebrae was approximately 2% age 3 fish, 90% age 4 fish, and 7% age 5 fish. Less than 1% of the fish sampled were age 6. Fall chum salmon samples were also collected for subsequent analyses in support of ongoing stock separation studies.

11. CHANDALAR RIVER ESCAPEMENT STUDY
(Conducted by U.S. Fish and Wildlife Service)

a. Location: Rivermile 13 of the Chandalar River.

b. Objectives: Determine timing and magnitude of salmon escapement to this river, locate primary spawning areas through radio telemetry, and collect salmon age, sex, and size information.

c. Results: The sonar-estimated escapement to the Chandalar River in 1987 was 52,416 fall chum salmon for the period August 10 through September 25. Mean date of run passage was September 7. Sonar counts during the last 24 hours of operation suggest significant fall chum passage after program termination.

Radio tags were implanted in 13 chinook and 15 fall chum salmon. A majority of tagged fish were found utilizing the lower 70 miles of the river.

12. DELTA RIVER ESCAPEMENT STUDY

a. Location: Lower mile of the Delta River.

b. Objectives: Determine timing and magnitude of salmon escapement to this river and collect salmon age, sex, and size information.

c. Results: A total season population estimate of 21,180 fall chum salmon was made for this river in 1987. The population estimate was generated from replicate (4) foot surveys, conducted throughout the period October 8 to November 16, in conjunction with the Delta River time density model developed in 1985.

13. CHENA RIVER CHINOOK SALMON STUDY

a. Location: Chena River (Tanana River drainage).

b. Objectives: Determine the timing and magnitude of chinook salmon escapement to the Chena River and estimate the proportion of the spawning population observed by a peak aerial census. Estimate the age, sex, and size composition of the chinook salmon escapement.

c. Results: Gill nets were fished at rivermile 16 to collect chinook salmon or tagging. A total of 517 chinook salmon was tagged, fin-clipped and released during the period 1-31 July. Ninety-five marked fish were subsequently recovered (4-19 August) on the spawning grounds from a total of 1,186 carcasses examined.

Based upon goodness-of-fit tests (Chi-square) no significant difference in the rate of recovery among different length categories or between sexes was found, nor was a significant difference found in the recovery rate by recovery date or between areas examined. An adjusted Petersen estimate off 6,404 chinook salmon with an approximate 95% confidence interval of $\pm$ 1,103 fish was obtained. An aerial census flown under fair survey conditions during the period of peak spawning accounted for 20.5% of the population estimate. Overall mean timing of the chinook salmon run was estimated to be 22 July.

The chinook salmon spawning population was composed of 6 age groups from 4 brood years. Both males and females were dominated by age group 1.4 (75%) with females being the most predominant (50% versus 25%). Females also predominated age group 1.5 while males dominated age group 1.3. The escapement male-to-female ratio was estimated at 1.00:1.38.

Chinook salmon samples were also collected for subsequent analyses in support of on-going stock separation studies.

14. SOUTH ALASKA PENINSULA TAGGING STUDY

a. Location: Tags applied in South Unimak and Shumagin Island Districts. Recoveries made in terminal fisheries and spawning areas.

b. Objective: Determine migration timing and final destination of chum and sockeye salmon that pass through Unimak and Shumagin Islands commercial fisheries.

c. Results: Between June 6 and July 2, 6,345 chums and 7,202 sockeye salmon were captured by chartered purse seine vessels and tagged in the south Unimak and Shumagin Island Districts. Catch sampling efforts in the Yukon River accounted for the recovery of 6 fall chum and 19 summer chum salmon. Adjusting these recoveries to account for fish not viewed for tags resulted in an estimate of 29 tagged fall chum, and 57 tagged summer chum salmon migrating into the Yukon River. This information in conjunction with tag returns to other terminal areas suggests that about 1.7% of the Yukon River fall chum salmon return and 33% of the summer chum salmon return were harvested during 1987 in the Shumagin and South Unimak Island fisheries.

15. CAPE ROMANZOF HERRING PROJECT

a. Location: Kokechik Bay and Scammon Bay.

b. Objectives: Determine distribution, timing and relative abundance of spawning herring and collect information on spawn deposition. Collect age, sex and size composition, fecundity data and relative maturity information of herring from test fishing and commercial catches.

c. Results: The herring biomass was estimated to be approximately 7,200 st based on aerial surveys. A total of 1,278 herring was sampled from test variable mesh and commercial gill nets. Approximately 63% of the total biomass was composed of age 8 and older Pacific herring. Ground surveys indicated primary spawn deposition occurred from 20 May to at least 4 June, termination of the project.