ANNUAL MANAGEMENT REPORT YUKON AREA, 1990

By:
Daniel J. Bergstrom
Chuck Blaney
Keith Schultz
Russ Holder
Gene Sandone
Dan Schneiderhan
Louis H. Barton
Dave Mesiar

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AUTHORS

Daniel Bergstrom is the Lower Yukon Area Management Biologist for the Alaska Department of Fish and Game, Division of Commercial Fisheries, 333 Raspberry Rd., Anchorage, Ak. 99518

Chuck Blaney is the Lower Yukon Assistant Area Management Biologist for the Alaska Department of Fish and Game, Division of Commercial Fisheries, 333 Raspberry Rd., Anchorage, Ak. 99518.

Keith Schultz is the Upper Yukon Area Management Biologist for the Alaska Department of Fish and Game, Division of Commercial Fisheries, 1300 College Road, Fairbanks, Ak. 99701.

Russ Holder is the Upper Yukon Assistant Area Management Biologist for the Alaska Department of Fish and Game, Division of Commercial Fisheries, 1300 College Road, Fairbanks, Ak. 99701.

Gene Sandone is a Research Project Leader for the Alaska Department of Fish and Game, Division of Commercial Fisheries, 333 Raspberry Rd., Anchorage, Ak. 99518.

Dan Schneiderhan is the Salmon Stock Biology Project Leader for the Alaska Department of Fish and Game, Division of Commercial Fisheries, 333 Raspberry Rd., Anchorage, Ak. 99518.

Louis H. Barton is a Research Project Leader for the Alaska Department of Fish and Game, Division of Commercial Fisheries, 1300 College Road, Fairbanks, Ak. 99701.

Dave Mesiar is the Regional Sonar Biologist for the Alaska Department of Fish and Game, Division of Commercial Fisheries, 333 Raspberry Rd., Anchorage, Alaska 99518.

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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 research projects are included in this report; complete documentation of these projects and results are or will be presented in separate reports. Data presented in this report supersedes 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 description of the area, fishery resources, fisheries and management practices.

2. Area Report, 1990. 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.

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

Fisherman hours have been computed, arbitrarily assuming that if a permit holder delivers in any fishing period, the fisherman fished the entire period for as many hours as were open to commercial fishing.

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

Total fishermen is the total number of fishermen making deliveries, regardless 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 (commercial and subsistence) 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 total utilization.

AREA INTRODUCTION

Description of Area and District Boundaries

The Yukon management area includes all waters of the Yukon River and its tributaries in Alaska and all coastal waters from Canal Point Light near Cape Stephens southward to Naskonat Peninsula (Figure 1). 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. 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 near the mouth or adjacent coastal villages, only salmon of Yukon River origin are harvested in this area.

Excluding the greater Fairbanks area, there are approximately 10,000-15,000 rural residents in the Alaskan portion of the drainage, the majority of whom reside in 43 small villages scattered along the coast and major river systems. Nearly all of these people are dependent to varying degrees on fish and game resources for their livelihood.

The Alaskan commercial salmon fishery occurs along 1,200 miles of the mainstem Yukon River and the lower 220 miles of the Tanana River. The present district boundaries were originally 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 2). 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 28 statistical areas for management purposes. Figures 3, 4, and 5 show the statistical areas for the lower three districts. Figures 6, 7, and 8 show the statistical areas for the upper three districts. Figures 9-13 show closed waters areas. Yukon River mileages are listed in Table 1.

Fishery Resources

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 (Oncorhynchus nerka) salmon follow in order of abundance.

Chum salmon are found throughout the Yukon River drainage and occur in two distinct runs; a summer (early) run and a fall (late) run. 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 14-16). 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 primarily 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 as well as various streams in Yukon Territory, Canada, including the mainstem Yukon River (Figures 16-18).

Chinook are the largest species found in the Yukon River ranging from 2-90 pounds and averaging 20-25 pounds. 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 14-18). Chinook salmon enter the mouth of the Yukon River soon after ice breakup during late May to 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. Major coho salmon spawning concentrations documented to date occur in tributaries of the upper Tanana River drainage (Figure 16).

Pink salmon enter the lower river during late June to mid-July, average approximately 3 pounds in weight and essentially spawn in the lower portion of the drainage (downstream of the village of Grayling, river mile 336) (Figure 14). Pink salmon have been caught in the mainstem Yukon River upstream as far as Ruby (river mile 601). During the past decade, large runs of pink salmon have occurred during even numbered years.

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

Pacific herring (Clupea pallasii) are found in Hooper Bay, Kokechik Bay and Scammon Bay (Figure 19). Spawning populations occur primarily in the Cape Romanzof area (Kokechik Bay and Scammon Bay) where suitable spawning habitat consisting of rocky beaches and rockweed (Fucus) is available. Spawning usually occurs from mid-May through mid-June.

Other species common to the freshwater and or coastal marine habitats of the Yukon Area are listed in Table 2.

Water Quality

Water quality and spawning habitats in the Yukon 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.

Salmon Fishery History and Description

In excess of one million salmon, mainly chum salmon were taken for subsistence use in some years during the early 1900's, even as recently as 1940 (Appendix Table 1). The first recorded commercial salmon harvest in the drainage occurred in 1903 when 70,000 pounds of chinook and fall chum salmon were taken in Yukon Territory, Canada. The first recorded commercial salmon harvest in the Alaskan portion of the Yukon drainage occurred in 1918. Relatively large catches of chinook, chum, and coho salmon were made during the first four years of the fishery. The majority of the catch was taken outside of the river mouth since catch restrictions were imposed within the river. The early commercial fishery met opposition and was closed during 1925-1931 because of concerns for the existing large subsistence fishery. Commercial fishing for chinook salmon was resumed at a much lower level in 1932 and a fishery has occurred annually since then. Commercial catches of chum and/or coho occurred during 1918-1921, 1952-1954, 1956 and since 1961.

Alaskan Subsistence Utilization

Subsistence fishermen operate gill nets largely in the main rivers and, to a lesser extent, in the coastal marine waters, capturing primarily salmon, whitefish and sheefish. Fish wheels 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 to early June to take smelt in the delta area and in late October to early November to take lamprey in the main Yukon River downstream of Grayling.

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 non-salmon species than are their downriver counterparts.

There is usually little intentional wastage of the fish taken for subsistence purposes. A major portion is sun dried or smoked for later consumption, while the head and viscera may be fed to dogs. Wet weather may cause wastage during the process of attempting to dry fish. In some locations large numbers of fish, primarily chum salmon, are taken to feed sled dogs.

Comprehensive annual surveys of the subsistence salmon fishery were initiated by the Department in 1961. Survey methodology and technique has varied from year to year which influences subsistence harvest estimates, however, it is felt that the estimates reflect harvest trends. Catch data from the Canadian portion of the drainage has been provided by the Government of Canada, Department of Fisheries and Oceans, (DFO) since 1962.

Subsistence salmon catch data in Alaska have been collected through the use of personal interviews, catch calendars (on which fishermen record daily catches), and mail out questionnaires. Beginning in the early 1970's, subsistence fishing permit catch information has been available for three sections of the Upper Yukon Area as follows: the area near the haul road bridge, the upper portion of District 5, and the Tanana River near Fairbanks. Since 1988, subsistence permits have been required for the entire Tanana River drainage.

Generally, catch calendars are mailed out prior to the fishing season in late May. Post-season surveys consist of personal interviews conducted in a majority of villages in the drainage, with follow up questionnaires mailed to fishermen that are not interviewed. Since 1961, Commercial Fisheries Division staff have conducted subsistence surveys, except for 1988. Subsistence Division staff conducted the 1988 survey with the objective of improving survey data collection and analysis.

The basic methodology developed by Subsistence Division in 1988, was to identify all households in each community. Community household lists were formulated by utilizing prior year survey lists of fishing families, village census information, and interviews with key individuals. The updated community household lists were stratified by "usually fish" and "usually not fish" households. Substantially more fishing households were identified than on fishing family lists used prior to 1988. However, historically, survey lists evaluated households in a broader sense (family units working together to harvest and process salmon), therefore, there is no direct correlation between fishing family and fishing household.

The stratification system developed by the Subsistence Division was further refined in 1990 in order to improve the accuracy and precision of the drainage-wide subsistence harvest estimate. Households were classified into one of five categories based upon their level of subsistence harvest in 1988 and 1989. Five categories of "use" were defined: (1) no information, (2) non-user, (3) light user, (4) medium user, and (5) heavy user. For those households in which information was collected in both 1988 and 1990, the mean total fish harvested was used for classification purposes. For those households in which information was collected in only one of the years, the reported harvest for that single year was used for classification purposes. Households in which no information was collected in either survey were placed into the "no information" category.

Different definitions of light user, medium user, and heavy user were used for the Lower Yukon Area and Upper Yukon Area. For villages in the Lower Yukon, light users were defined as households harvesting between 1 and 200 fish, medium users were defined as those harvesting between 201 and 500 fish, heavy users were defined as those harvesting more than 500 fish. For villages in the Upper Yukon, light users were defined as those households harvesting between 1 and 100 fish, medium users were defined as those households harvesting between 101 and 700 fish, and heavy users were defined as those households harvesting more than 700 fish.

A stratified random sample was drawn from the strata formed by combinations of village and use. Assuming that households tend to harvest the same number of fish in the current year as they have historically, this stratification system

allows the households with the heaviest use of the resource to be sampled more intensively. Prior to 1990, attempts were made to census all users or fishing households. Using a random sample should reduce the bias associated with attempting to conduct a complete census, but not everyone can be contacted.

For all years, subsistence catch data have been expanded for unknown fishing families or households on a community basis. Expanded community harvests are then summed for district and total drainage estimates.

Historically, subsistence salmon harvests were very large. About 1930, the airplane began replacing the sled dog as mail and supply carrier, starting a gradual reduction in subsistence harvests. During the early to mid 1960's, there was an increasing use of snow machines which replaced sled dogs faster than did the airplane. Subsistence salmon catches declined through the 1970's as increased welfare payments and employment opportunities, including commercial fishing activities, became available to rural residents. Declines in subsistence catch levels through the 1970's varied by species. The reduction was not necessarily related to fish abundance, but likely reflected decreases in effort and harvest due to a changing way of life. Beginning in the early 1980's, due to a renewed interest in sled dog racing, the number of dogs per family has increased in some portions of the drainage. Coincidentally, there has been an increase in the subsistence salmon harvest. In addition, the human population along the river is increasing, which may also relate to increased subsistence harvests.

Reflecting the above changes in subsistence use patterns, the harvest of salmon other than chinook (primarily chum salmon) averaged 416,600 fish during 1961-1965 (reference Yukon Area Annual Management Report, 1985), and then decreased to an average of 209,600 fish during the period 1966-1973. More recently, subsistence catches have increased, averaging 364,721 fish during 1974-1983.

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 (reference Yukon Area Annual Management Report, 1985). During the 1978-1988 period, chinook salmon catches have increased substantially, averaging approximately 39,900 fish per year (Appendix Table 28).

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 of summer chums since 1981, combined with the use of fish harvested to produce commercial roe sales, suggest a trend of increasing utilization.

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. 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. 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 use than summer chum

salmon, primarily due to differences in availability. It is estimated that fall chum salmon comprise 60-75% of the total subsistence harvest in this area.

It should be noted that the practice of keeping sled dogs is much more common in the Upper Yukon Area than in the delta area and is considered a major factor affecting subsistence use. It is also likely that the sale of subsistence-caught salmon roe (legal from 1974 through 1977) increased subsistence chum salmon catches above normal use levels during that period. Subsistence roe sales were not considered a significant factor affecting harvest levels in the Lower Yukon River Area. Additionally, estimates of illegal sales of fall chum and coho salmon and salmon roe in Districts 5 and 6 in 1987 were included with subsistence harvests, because there was no fall commercial fishing season allowed that year.

Reporting of total utilization in the Upper Yukon Area in Appendix Tables 28-31 was changed in 1990. The commercial harvest is reported as fish sold in the round and subsistence harvest is reported excluding estimates of fish harvested to produce commercial roe sales. Estimated harvests of female salmon; and in District 4, the harvest of summer chum males, to produce roe sales are reported as commercial related harvest.

The commercial related salmon harvest can be viewed as utilization for both commercial and subsistence purposes. The harvest of female chinook, summer chum, fall chum and coho salmon to produce roe sales is a commercial operation, however, the carcasses are utilized for subsistence purposes. These harvests are assumed to be reported as subsistence use during subsistence surveys such as in the current year subsistence harvest (Table 15). For this report, the decision was made to separate harvests that produce roe sales from subsistence harvests because of the difficulty in assigning a single use to the harvest. For instance, guideline harvest ranges require an estimation of "commercial harvest", but as stated above these harvests are also reported as subsistence. To avoid double counting, a separate commercial related harvest estimate can be summed with subsistence harvest for total subsistence utilization, or it can be summed with the commercial harvest for total commercial utilization when evaluating guideline harvest ranges.

The harvest of males in salmon roe fisheries other than the summer chum salmon fishery in District 4, are believed to be either sold or retained for subsistence use. The difficulty in estimating the summer chum salmon subsistence harvest in District 4 has been discussed in previous annual management reports. The summer chum commercial fishery in District 4 is different from the other Upper Yukon Area fisheries, primarily due to the greater magnitude of roe sales. Commercial fishermen in District 4 have only a very limited market for summer chum salmon flesh. As a result, fishermen extract and sell roe from their catch and retain the carcasses for subsistence use. In fact, it is probable that the unmarketable commercial product has simply replaced a large portion of the subsistence harvest in this area. However, reported subsistence harvests in the past have not equaled the estimated commercial related harvest. Therefore, male summer chum salmon are included in commercial related harvests for District 4. Subsistence surveys and personal interviews from 1986 through 1990 were conducted so as to estimate the number of summer chum salmon taken by standard subsistence fishing means (not commercial related). The proportion of the summer chum subsistence

harvest taken unrelated to commercial fishing in 1986 was used to estimate District 4 subsistence harvests from 1980 through 1985.

Alaskan Personal Use Utilization

Due to changes in the state subsistence law in 1986, which limited subsistence hunting and fishing to rural Alaskan residents, the Board of Fisheries created personal use salmon fisheries in the Yukon Area for non-rural state residents. These regulations primarily affected the greater Fairbanks area. Initially, only a fall chum salmon personal use fishery was implemented in 1987. In 1988, personal use fisheries were created for all salmon. However, the Alaska Supreme Court ruled effective July 1, 1990 that every resident of the State of Alaska was eligible as a subsistence user. In effect, this decision made the personal use category obsolete in the Yukon Area. Permits are now required to take salmon for personal use in Subdistricts 6-A, 6-B, and 6-C only.

Personal use fisheries are regulated much the same as subsistence fisheries, except that salmon taken for personal use could be used only for human consumption and bait. In addition, personal use fishermen are required to possess a resident sport fishing license.

Typically, personal use catches are included with subsistence harvests in this report. For the most part, personal use fishermen participated as subsistence fishermen prior to establishment of personal use regulations.

Alaskan Commercial Utilization

The relatively recent development and expansion of the commercial salmon fishery has enabled many area residents to obtain a cash income. The cash income in many cases provides a means for the area residents to maintain a subsistence life-style. Income earned from commercial fishing is often used to obtain hunting and fishing gear (such as boats, outboard motors, etc.) utilized for subsistence activities. In recent years (1985-1989), commercial fishermen have received approximately 8.8 million dollars annually (Appendix Table 24). The majority of commercial fishermen are residents of the Yukon River drainage (Table 5).

Most fishermen operate outboard powered skiffs of 18 to 24 feet in length and do not use gill net rollers or power reels of any type. In recent years, there has been a large increase in the use of larger outboard motors, VHF and CB radios, as well as fish finders, which has increased the efficiency of the fleet.

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. Production of salmon roe (purchased directly from fishermen) has increased in recent years in the Upper Yukon Area (Appendix Tables 3 and 4). Fish ticket reports containing a breakdown of salmon roe by species other than chum salmon were available for the first time in 1990. It is certain that

relatively small amounts of chinook and coho salmon roe were sold prior to this time, but were included as summer chum and fall chum salmon roe, respectively.

Chinook Salmon

During the 1954-1960 period, a 65,000 chinook salmon quota was in effect for the Alaskan portion of the river. Of this total, not more than 50,000 could be taken below the mouth of the Anuk River (river mile 63), 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. The average chinook salmon catch for this period was 65,092 fish.

Under new regulations established in 1961, the annual chinook salmon commercial harvest for the Yukon Area averaged 104,280 fish for the period 1961-1970 (Appendix Table 2). This average was a 60% increase over the 1954-1960 period. During the period 1971-1976 catches declined, averaging 88,067 fish annually because of below average runs (except 1971) and regulatory restrictions.

During the late 1970's, chinook salmon commercial catches began increasing. Due to increased efficiency of commercial fishermen and in some years due to above average run strength, chinook salmon commercial catches averaged 140,692 fish during 1980-1984. Concern for possible over-exploitation during this period resulted in reduced harvests, averaging 116,836 fish during the recent five year period 1985 to 1989 (Appendix Table 2).

Summer Chum Salmon

From statehood through 1974, the Yukon River commercial summer chum salmon fishery steadily developed as subsistence harvests declined. Commercial summer chum catches increased rapidly after 1974 as regulations were relaxed and the upriver commercial fishery expanded. Beginning in 1978, in response to unfavorable chum salmon market conditions, the commercial fishery in the Upper Yukon Area became primarily a salmon roe fishery (Appendix Table 3).

Summer chum salmon commercial catches have averaged 785,587 fish and 237,474 pounds of roe annually during the period 1985-1989. The Yukon River summer chum salmon commercial harvest has increased during this time period 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 Area fishery), greater availability of processing facilities and tendering, higher prices paid to fishermen, the development of Japanese markets, and the occurrence of several very large runs during recent years. The majority of the harvest takes place in Districts 1, 2, (fish in-the-round only); and 4 (primarily roe).

Fall Chum and Coho Salmon

The commercial fishery for fall chum salmon in the Yukon River began in the early 1960's. During the 1961-1968 period, catches averaged only 36,185 fish annually. Fall chum salmon commercial harvests increased greatly through 1983. The average harvest for the period of 1980-1984 was 298,980 fish for the Yukon Area. Observations of low spawning escapements from 1982 through 1984 resulted in reduced harvests to an average of 162,271 fall chum for the recent five year period (1985-1989). There was no commercial fishery allowed in 1987. Fall chum salmon roe sales by commercial fishermen began in the Upper Yukon Area during 1978 and have averaged 6,223 pounds annually (1978-1989) (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 largest fall chum catch occurred in 1981 when 466,451 fish and 11,285 pounds roe were taken.

Coho salmon returns to the Yukon River are of lesser magnitude than fall chum salmon and are taken incidental to the commercial fishery for fall chums. There has been a trend of increasing coho salmon harvests since 1984. Coho salmon catches have averaged 54,978 fish during the period 1985-1989 (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.

Alaskan Fishery Development

Lower Yukon Area

Since the onset of the commercial salmon fishery 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 flesh quality is optimal. Historically, the Lower Yukon Area was primarily managed for the harvest of chinook salmon. More recently, the lower river fishery during June is now managed for the harvest of both chinook and summer chum salmon. Set and drift gill nets are the legal gear types in the Lower Yukon Area.

Beginning in 1961, when chinook salmon catch quotas were eliminated for Districts 1 and 2, and continuing through 1981, the fishery was regulated by scheduled weekly fishing periods with the season opened by a published regulatory 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 the 1982 season, 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 efficiency.

Since 1982, the "chinook salmon season" (unrestricted mesh size fishing periods) in these districts has opened by emergency order, usually between June 5-15, and is closed by emergency order during late June or early July depending on run timing and magnitude. From 1982-1986, fishing periods of 24 hours duration generally occurred twice weekly. During 1987, 12-hour periods were introduced and during 1988 all unrestricted mesh size periods were 12 hours in duration. In 1989, a combination of 12- and 6-hour unrestricted mesh size periods occurred.

Commercial fishing effort increased sharply during 1961-1975, with license registration for set gill nets more than doubling while drift gill net gear tripled during this period. Set gill nets are commonly used near the river mouth, but drift gill nets are the predominant gear type elsewhere. With the advent of the Commercial Fisheries Limited Entry (CFEC) program in 1976, fishing effort in terms of the number of participants stabilized, but efficiency has increased. From 1976 through 1989, an average of 705 CFEC gill net permits have been issued annually (Appendix Table 7).

During 1976-1980, prior to establishment of the 60,000-120,000 guideline harvest range, chinook salmon commercial harvests in Districts 1 and 2 averaged 102,885 fish. For the period 1981-1989, District 1 and 2 chinook salmon harvests averaged 116,773 fish.

In District 3, a guideline harvest range of 1,800-2,200 chinook salmon 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. The District 3 catch has averaged 1,788 fish annually (1985-1989).

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 periods allowing unrestricted mesh size. Comparative Lower Yukon Area chinook and summer chum salmon catches by mesh size are presented in Appendix Table 11.

The Alaska Board of Fisheries liberalized regulations during the 1970's to provide for harvest of summer chum salmon surplus to subsistence and escapement requirements. A regulation was promulgated in 1973 which specified that gill nets of six inch mesh size or less could be fished after a specified date in early July in Districts 1 and 2. Use of small mesh gill nets in early July allowed a greater harvest of summer chum salmon and also minimized the chinook salmon catch during the end of the chinook run. 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 for establishing restricted mesh size periods (six inch maximum mesh size) in Districts 1, 2, and 3. Additionally, the Board of Fisheries issued a directive to the Department to provide for 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 was average or better in strength.

In February 1990, the Board of Fisheries established a river wide guideline harvest range of 400,000 to 1,200,000 summer chum salmon. Increasing commercial harvests during the 1980's provided the impetus for establishing guideline harvest ranges. The river wide harvest range was suggested by the department. The Board established guideline harvest ranges for districts and subdistricts using the 1975-1989 average harvest shares. Districts 1 and 2 have a combined guideline harvest range of 251,000 to 755,000 summer chum salmon. The District 3 guideline harvest range is 6,000 to 19,000 fish.

In recent years (1985-1989) the Lower Yukon Area commercial summer chum salmon catch has averaged approximately 699,031 fish annually (Appendix Table 3).

Since 1961, with the exception of the 1987 season, the commercial fishing season in the lower Yukon districts has been reopened following the closure of the chinook and/or summer chum salmon season to allow harvest of fall chum and coho salmon.

Prior to 1973, the closure between the chinook (summer) and the fall chum 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.

A 200,000 fall chum salmon quota (after mid-July) was implemented for the combined lower three districts in 1974. Also, fishing time was reduced from four to three days per 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 per week and the 200,000 quota was replaced by a flexible guideline harvest range of 120,000-220,000 fall chum salmon.

Effective beginning in 1983, fishing time has been regulated by emergency order in Districts 1, 2, and 3. From 1983 though 1985, two twelve hour fishing periods per week were established by emergency order in Districts 1 and 2, except that fishing time remained at two days per week for set net fishermen in the coastal Set Net Only Area of District 1 (Figure 20). Fishing time in District 3 was reduced from 3 to 2 days a week. Also, a 7-10 day season closure in Districts 1, 2, and 3 during late July was established.

Fishing time was further restricted in 1986 through implementation of the Yukon River Fall Chum Salmon Management Plan in anticipation of poor returns of fall chum salmon during 1986-1988. 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, and the commercial fishing season was opened by emergency order. Under this management plan there was a possibility of no commercial fall chum fishery as occurred during 1987. During 1986, 1988 and 1989, fishing period duration was restricted to as short as 12 hours in the Set Net Only Area and six hours in the remainder of the Lower Yukon Area.

Lower Yukon Area fall chum salmon catches since 1970 range from 131,313 to 341,760 fish, with the exception of 1986 through 1988 seasons when the harvest ranged from 0 to 113,400 fish (Appendix Table 4). A trend of decreasing commercial harvest is apparent by comparing the recent five year (1985-1989) average harvest of 111,930 fish to the average harvest of 224,377 fish during 1980-1984.

The harvest of coho salmon in the Lower Yukon Area is incidental to the harvest of fall chum salmon, with the commercial season closing after an appropriate harvest of fall chum salmon occurs. The coho salmon run peaks during middle to late August in the lower river. Lower Yukon coho salmon catches averaged 46,320 fish annually from 1985-1989 (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. 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. Beginning in 1988, with the opening of a new, longer runway in Emmonak, fresh salmon have been flown out from this village also. Hard salting operations are located at Black River and near Fish Village.

Upper Yukon Area

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. Fish wheels and set gill nets are the legal gear types for commercial fishing in the Upper Yukon Area.

Fishing effort increased from 1971 to 1973, and processors developed outside markets due to the steadily increasing value of salmon. In recognition of the developing upriver commercial fishery and the desire of fishermen in the upper portion of the drainage to achieve increased participation, the Alaska Board of Fish and Game adopted several major regulation changes prior to the 1974 fishing season. These regulations provided for substantial increases in the upriver commercial catches, reduced gear conflicts, and made provisions for allowing escapement needs to be met. These regulations included:

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, 5 and 6, were added.

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 1974, the Alaska 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 (two 48 hour periods) fishing schedules were established in 1980. In District 4, the commercial fishing season opened 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 beginning in 1979. The current chinook salmon guideline harvest ranges of 2,250-2,850 fish for District 4, 2,700-3,300 fish for District 5, and 600-800 fish for District 6 were established in 1981. The current combined fall chum and coho salmon guideline harvest ranges were established in 1986: District 4: 0-20,000 fall chum and coho salmon combined; District 5: 0-20,000 fall chum and coho salmon combined; and District 6: 0-10,250 fall chum and coho salmon, combined.

3. District 4 boundaries were redefined and new subdistricts created to allow for stock-specific management of fall chum and coho salmon in 1979.

4. New subdistricts within District 5 were created in 1981 to achieve more balanced harvests and escapements.

In the spring of 1988, the Alaska Board of Fisheries met in special session to take public and staff testimony on proposed salmon management practices on the Tanana River. This special session was a result of large scale illegal salmon and salmon roe sales documented in 1987 in portions of Districts 5 and 6. During this special session, the Board adopted regulations which:

1. Reduced allowable commercial and subsistence fishing time from two 48-hour periods per week to two 42-hour periods per week.

2. Specified that there be no more than one 42-hour commercial fishing period per week during the fall season.

3. Minimized abuse in the subsistence fishery by requiring subsistence fishing permits, catch limits, and in-season reporting requirements.

4. Expanded rights of inspection of processing plants by enforcement personnel.

The Board further instructed the staff to manage the fishery on the basis of existing guideline harvest ranges, indicating that these guidelines are to be exceeded only if it can be determined that doing so would not jeopardize meeting subsistence and spawning escapement requirements.

In February 1990, the Board of Fisheries adopted the Yukon River salmon management plan and established guideline harvest ranges for summer chum salmon in the upper Yukon River as follows:

1. Subdistrict 4-A: 113,000 to 338,000 summer chum salmon, or the equivalent roe poundage of 61,000 to 183,000 pounds or some combination of fish and pounds of roe.

2. Subdistricts 4-B and C: 16,000 to 47,000 summer chum salmon.

3. District 5: 1,000 to 3,000 summer chum salmon.

4. District 6: 13,000 to 38,000 summer chum salmon.

In addition, regulations were adopted which stipulated that no more than 183,000 pounds of summer chum salmon roe from Subdistrict 4-A catches may be sold annually. However, if the cap is reached, fishing effort may continue, but only the sale of chum salmon in the round will be allowed. In recognition of the difficulty in estimating summer chum salmon harvests in Subdistrict 4-A, the Board also required that all salmon caught by CFEC permit holders during commercial fishing periods in this subdistrict be reported in numbers on fish tickets.

Due to concerns for low fall chum salmon spawning escapements in the Toklat River, the Board (in February 1990) closed subsistence fishing for chum salmon in the Toklat River, and the Kantishna River from the mouth of the Toklat River to it's confluence with the Tanana River. Further, the Subdistrict 6-A commercial fishing schedule was reduced to no more than one 24-hour period per week during the fall fishing season.

The major difference between the Lower and Upper Yukon Area fisheries is their relative size geographically as well as in numbers of fishermen and catch. In general, the abundance of fish available for harvest decreases, the further a fishermen is located from the mouth of the Yukon River. This results both from harvests and fish migration into tributary streams, downriver. The Upper Yukon Area commercial salmon harvest has averaged approximately 12% of the total area harvest of fish sold in the round and 100% of the roe sales (1982-1989). 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).

For reasons of relative abundance, availability, flesh quality, and the existing regulation structure, the chinook and fall chum salmon runs are the target species of the commercial fishery in District 5. The chum salmon runs are of paramount importance in Districts 4 and 6, and comprise the majority of the total upriver commercial harvest. Relatively few summer chum salmon are taken commercially in District 5. In the Upper Yukon Area, summer chum salmon flesh is difficult to market because of the high cost of transportation and generally advanced state of sexual maturity, however, summer chum salmon roe quality is judged by the industry to be excellent.

The Upper Yukon Area 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 must compete with higher quality sockeye and chum salmon. This has resulted in decreased sales of summer chum salmon in the round since 1980.

To varying degrees between years and districts, markets for chum salmon flesh remain available for higher quality male summer chum salmon and fall chum salmon (Appendix Tables 3 and 4). Carcasses resulting from roe extraction appear to be fully utilized for subsistence purposes except for District 4 summer chum harvests since 1980. District 4 commercial related summer chum salmon harvests have been estimated since 1980 based on fish ticket sales (either in the round or as roe), estimated sex ratio as documented by the Department operated test fish wheel located near Kaltag from 1981 to 1985, and estimates of average roe weight per female chum salmon.

In 1989, a comprehensive study was conducted in District 4 to collect more accurate average roe weight per female and sex ratio data to estimate the total commercial related summer chum harvest. The average roe weight per female for the 1989 season was calculated to be 0.9 pounds. A similar average roe weight per female was estimated in samples collected in 1988. Prior to 1988, an average roe weight of 1.0 pounds per female was used to calculate commercial related harvest, and was estimated based on the subjective judgement of processors and fishermen. Sampling of catches from various fish wheels and gill nets resulted in an estimated mean proportion of 0.62 females for the 1989 season. The mean proportion of females in the commercial harvest estimated by this study was larger than the mean proportion of females captured at the Stink Creek test fish wheel which ranged from 0.566 to 0.600 (1981-1985). Results of studies conducted in 1990 are similar to those obtained in 1989.

During the period of 1985-1989, approximately 420,627 summer chum salmon have been harvested annually in association with the District 4 commercial fishery (Appendix Table 6). A portion of the carcasses resulting from this catch is utilized for subsistence purposes (primarily for dog food), however, some wastage is suggested by the large difference between the estimated commercial harvest and the reported subsistence harvest during some years.

Fish wheels are the primary type of gear for harvesting summer chum salmon because of local fishing conditions, efficiency, and relative ease of operation.

Fish wheels account for roughly 95% of the commercial harvest of this species in the Upper Yukon Area.

Chinook salmon are of lesser importance to the commercial fisheries in the three upper districts; the total harvest guideline range allocated by the Alaska Board of Fisheries is 5,550 to 6,950 chinook salmon (Appendix Table 15). The guideline harvest range has not been met in District 4 during many years. Most fishermen choose to retain chinook salmon for subsistence use because of the possibility that the summer chum fishery would close once the chinook salmon guideline range has been met. However, since 1988 chinook salmon sales have substantially increased in District 4. 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 effort occurs during early July.

The majority of commercially caught chinook salmon are transported to Fairbanks or Galena 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 markets. Most fall chum salmon harvested in these districts are tendered by boat or single-engine aircraft from collection points along the river and are subsequently trucked or flown to Manley Hot Springs, Galena, Nenana or Fairbanks 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, undocumented quantities of chum and coho salmon taken commercially are dried and sold as dog food.

Canadian Harvests of Yukon River Salmon

Records of Canadian commercial utilization of Yukon River origin salmon indicate a fishery occurred sporadically from 1903 to 1917 and continuously from 1918 to 1947. No harvest records are available from 1948 to 1957 (Appendix Table 1). Since 1958 harvest records document the annual catch by species, and since 1961, by user group. The average Canadian chinook and fall chum salmon commercial harvests during the most recent five years (1985-1989) were 11,448 and 27,123 fish, respectively. Chinook and fall chum salmon non-commercial harvests averaged 7,892 and 4,242 fish, respectively.

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 were not specifically addressed in this document, one provision of the treaty required the two countries to begin negotiations regarding Yukon River salmon stocks which originate in Canada.

Since that time, U.S. and Canadian delegations have met in eight 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 along the Yukon River.

At negotiations held in late March and late April, 1990, the Parties reached a tentative agreement for Canadian harvest shares during run rebuilding. Canada would endeavor to manage the harvest of chum salmon in the mainstem Yukon River drainage in Canada within a guideline harvest range of 23,600 in years of weak returns and 32,600 in years of strong returns. Canada would endeavor to manage the harvest of chinook in the mainstem Yukon River drainage in Canada within a guideline harvest range of 16,800 in years of weak returns and 19,800 in years of strong returns. Note that these harvests include both commercial and non-commercial catches.

The Parties also reached a tentative agreement on a minimum spawning escapement objective of 18,000 for the Canadian mainstem stock for six years beginning in 1990. During this period of time the U.S. would endeavor to deliver annually between 34,800 and 37,800 chinook salmon to the Canadian border on the mainstem Yukon River. These agreements would not become legally binding until a treaty between the two nations is ratified. No spawning escapement objective has been agreed to for chum salmon originating in Canada.

Marine Harvests of Yukon River Origin Salmon

High Seas Salmon Gill Net Fisheries

Chinook salmon of western Alaska origin have been intercepted yearly by the Japanese mothership and landbased gill net fisheries (Appendix Table 40). 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 for that year.

Until 1988, the Japanese mothership salmon fishery operated in parts of the U.S. Exclusive Economic Zone (EEZ, waters from 3 to 200 miles of the U.S. coast). Beginning in 1988, the mothership fishery has occurred outside of the EEZ. 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 under-reporting of catches result in continued losses of western Alaska fish.

The 1990 catch of chinook salmon by the Japanese mothership gill net fishery was 23,000 fish. Estimates of the numbers of western Alaska chinook salmon in this harvest are not available.

Foreign, Joint-Venture, and U.S. Domestic Groundfish Fisheries

Information on incidental salmon catches in offshore fisheries is not complete for recent years (Appendix Table 40). Foreign groundfish fisheries in the EEZ ended in the Gulf of Alaska in 1985 and in the Bering Sea in 1987. In 1990, joint-venture groundfish fisheries captured 14,000 chinook salmon in the Bering Sea and Aleutian Islands area. The joint-venture fishery in the Gulf of Alaska ended in 1988.

Continued concern exists over large foreign trawl fisheries operating in international waters ("doughnut" area) of the Central Bering Sea. It is speculated that the total groundfish catch of all nations in this area may exceed 1,000,000 m.t. Since there are no international agreements that require observer coverage on this fleet, the incidental catch of chinook salmon, which are known to be in this area, is unknown.

Due to the lack of an observer program, the numbers of salmon taken by the U.S/domestic groundfish fleet is also not known. This is of concern since the U.S. groundfish fishery is rapidly expanding with 1,695,127 m.t. taken from the Bering Sea and Aleutian Island Areas in 1990. The National Marine Fisheries Service is planning on initiating an observer program beginning in 1990.

Alaska Peninsula

The majority of salmon captured during June in the Unimak and Shumagin Islands area, located on the south side of the Alaska Peninsula, are bound for terminal fisheries in the northern gulf of Alaska and the Bering Sea, including the Yukon River. The stocks contributing to this fishery have been described by several tagging studies, including a tagging study in 1987 and a 1983 scale pattern analysis study. Sockeye salmon is the target species in the June fishery, but relatively large incidental catches of chum salmon are made. The sockeye salmon harvest is regulated by a quota that is annually adjusted according to the Bristol Bay sockeye salmon forecast. A 400,000 chum salmon quota was also in effect during 1986, but was not extended by the Alaska Board of Fisheries to the 1987 fishery. The Board adopted a 500,000 chum salmon quota for the 1988 and 1989 fisheries. New regulations for the 1990 season included delaying the season opening until June 13 and increasing the chum salmon quota to 600,000 fish. A total of 1,359,000 sockeye and 503,000 chum salmon was taken in the June fishery in 1990. The previous 5-year average chum salmon harvest by this fishery was 447,000 fish.

Norton Sound

A commercial harvest of 8,895 chinook salmon was taken in coastal Norton Sound waters in 1990. Some Yukon River chinook salmon are known to be intercepted by this fishery. The previous 5-year average harvest was 8,535 fish.

Escapement Enumeration

An essential requirement in management of the Yukon River salmon fisheries is the documentation of annual salmon spawning escapements. Such documentation provides for:

1. Determination of appropriate escapement levels or goals for selected spawning areas or management units.

2. Evaluation of escapement trends.

3. Evaluation of the effectiveness of the management program, which in turn forms the basis for proposing regulatory changes and management strategies.

4. Evaluation of stock status for use in projecting subsequent returns.

The Yukon River drainage is too extensive (330,000 mi^2) for complete comprehensive escapement coverage to all salmon spawning streams during any given season. Consequently, low-level aerial surveys from single-engine, fixed-wing aircraft form an integral component of the escapement enumeration program. Nevertheless, comprehensive enumeration studies such as intensified ground surveys, mark-and-recovery experiments, 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 abundance and are often less dependent upon weather and water conditions. However, due to costs associated with manning and operating the more sophisticated enumeration projects, relatively few have been initiated over the years and have been restricted primarily to major spawning streams, e.g., the Anvik, Andreafsky, Sheenjek, Chandalar, Chena, Salcha, and Delta Rivers in Alaska and the Fishing Branch River and Whitehorse fishway in Canada. Only during the past decade (since 1986) has an attempt been made to estimate total salmon passage by species through the lower mainstem Yukon River. This project, located at rivermile 123 near Pilot Station, involves using hydroacoustic techniques to estimate the total number of fish passing upstream as well as a comprehensive test drift gillnet fishery to apportion sonar counts to species. A second study designed to estimate salmon abundance by species in the mainstem Yukon River has operated annually since 1982 (excluding 1984) near Dawson in Canada. That project involves a comprehensive mark-and-recovery study designed to estimate the abundance of chinook and chum salmon entering the Canadian portion of mainstem Yukon River.

Perhaps the greatest advantage of aerial surveys, as they pertain to the Yukon River drainage, 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, aircraft type, 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 and established expansion factors. Aerial survey results may also be useful in apportioning tributary spawning distribution to a mainstem total escapement estimate obtained from sonar, weir or tower counts.

Aerial escapement estimates are made of as many spawning streams as possible within the confines of fiscal, manpower, and weather constraints. However, selected (representative) 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/or by their geographic location with respect to other unsurveyable salmon spawning streams in the general area.

Interim escapement objectives have been established for several Yukon River salmon spawning systems (Table 19). These objectives represent the approximate minimum number of desired spawners considered necessary to maintain the reproductive potential of each stock and are based upon historical performance, i.e., they are predicated upon some measure of historic averages. With exception of Anvik River chinook salmon, establishment of "optimum" escapement goals which are based upon analyses of maximum sustained yield (MSY) is not possible at this time due to the nature of the Yukon River mixed stock fisheries, lack of stock identification data, and consequential inability to reconstruct total in-river stock specific returns. Consequently, most interim escapement objectives are based upon aerial survey index estimates which do not represent total escapement but do reflect annual spawner abundance when using standard survey methods under acceptable survey conditions. This is particularly true for those objectives established for chinook and summer chum salmon. However, the interim objectives which have been established for selected fall chum salmon spawning stocks represent the desired minimum target for <u>total</u> spawning abundance; being based upon a somewhat more comprehensive escapement data base.

In order to gain greater understanding of escapement requirements and fluctuations in run size by spawning stocks, several specific projects are underway. Stock composition modeling is being utilized for chinook salmon based on scale pattern analysis. In addition, electrophoretic techniques are being used by USFWS in an effort to identify discrete stocks of chinook and chum salmon in mixed stock Yukon River fisheries.

Management

The overall goal of the Yukon Area research and management programs is to manage the herring and salmon runs on an optimum sustained yield basis. Subsistence fishing has been designated by the Alaska State Legislature and the Alaska Board of Fisheries as the highest priority use. The management of the Yukon River salmon fisheries must take a conservative approach to maintain the subsistence priority, and to provide for spawning area escapements to sustain production of the resource.

There is a lack of adequate comparative catch and return data on which to evaluate the long term effects of increased commercial harvests since most of the fisheries have only developed or expanded in recent years. Effective management of the fisheries is difficult due to the variety of user groups, the complexity of multi-stock, multi-species salmon runs and the immense size of the Yukon River drainage. Fisheries distributed over 1,400 river miles harvest stocks of fish that are up to several weeks and hundreds of miles from their spawning grounds. The Yukon River commercial fishery is a mixed stock fishery and as a result some tributary populations may be under or over harvested in relation to their actual abundance. It is impossible to manage stocks separately, based on current knowledge, and there is concern that small spawning populations may be reduced to very low levels.

Accurate in-season assessments of escapements immediately past the intensive downriver fishery are very difficult with the present available technology and funding. It is hopeful that the main river sonar project at Pilot Station may provide estimates of fish passage in the near future.

The two basic regulations used to manage the commercial salmon harvest are emergency order authority, which is used to implement fishing season openings and closures, fishing periods, and mesh size restrictions; and guideline harvest ranges established by the Alaska Board of Fisheries. Commercial fishing is normally allowed for a total of from one to four days per week depending on the district and species involved. In recent years fishing time in the Lower Yukon Area has been significantly reduced. Other areas, such as Subdistrict 4-A and District 5 have also experienced reduction in fishing time. Guideline harvest ranges have been established for chinook, summer chum, and fall chum salmon fisheries throughout the Alaskan portion of the drainage.

During the fishing season, the salmon return is monitored on a daily basis through management and research programs. In-season data is compared to data from other seasons in relationship to escapements and total harvests during those years. If it becomes apparent that the run is substantially smaller or larger than needed for escapement and subsistence requirements, then the commercial harvest rates can be adjusted through the use of emergency orders. A list of emergency orders dealing with changes in fishing time and other regulations issued for the Yukon Area in 1990 is presented in Attachments 1 and 2. Regulation changes promulgated by the Board of Fisheries during meetings held in November 1989 and February 1990 are presented in Attachment 3.

Research and management projects have been established, and other programs are planned, contingent on additional funding, for obtaining the biological

information necessary for better management of salmon runs. During 1990, the following projects were conducted:

1. Test Fishing. Projects located at South, Middle and North Mouths (set and drift gill nets for all salmon) in the delta area and a fish wheel site near Ruby (fall chum and coho salmon) to determine run timing and to provide an index of abundance for comparisons between years. Contract fishermen operated fish wheels as part of test fishing projects at Manley and Nenana on the Tanana River. Additionally, a variable mesh test net program was operated to evaluate abundance and distribution of Pacific herring within Kokechik and Scammon Bays.

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

3. Main River Sonar. BioSonics hydroacoustic equipment was operated in the mainstem Yukon River near Pilot Station to obtain inseason estimates of fish passage by species. There are difficulties with possible fish passage beyond the sonar range and species apportionment. In addition, a mainstem sonar feasibility study was implemented for the first season in the Tanana River near Manley Hot Springs.

4. Stock Separation Biology. Catch and escapement scale and tissue samples of chinook and chum salmon were collected throughout the drainage for the purpose of identifying major stocks by scale pattern analysis and electrophoretic technique. These projects may provide the capability for allocating the catch to areas of origin.

5. 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. Similarly, Upper Yukon commercial catch and effort data were collected in the Fairbanks office.

6. Aerial Surveys of Salmon Spawning Streams. Aerial surveys were flown to monitor spawning escapements in major index streams and to develop additional escapement index areas. Additionally, fall chum salmon foot surveys were conducted in the Tanana River drainage.

7. Tagging Project. To estimate harvest rates and total escapement to the upper Yukon River (Yukon Territories, Canada) a salmon tagging project was conducted (chinook and fall chum salmon) by DFO. Additionally, Department mark-and-recapture projects were conducted on the Chena and Salcha Rivers to estimate total chinook salmon escapement to these two important streams (Sport Fish Division).

8. Subsistence Surveys. Subsistence surveys were conducted to estimate subsistence salmon harvest and effort in the Yukon Area.

9. Herring Spawn Deposition Program. Relative herring abundance was monitored by conducting qualitative spawn deposition studies in Kokechik and Scammon Bay.

Attachment 4 lists studies undertaken during 1990 and includes a summary of objectives, procedures and preliminary results for each project.

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, two assistant area management biologists 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, 1989 through June 30, 1990 were approximately $1,000,000; an additional $216,000 was allocated from the Federal Government to address research issues associated with U.S.-Canada salmon negotiations. An additional $26,600 State funds were allocated to manage the commercial fishery and conduct herring research studies at Cape Romanzof.

In addition to the salmon and herring management and research programs, the staff monitors catches of commercial and subsistence fisheries on under-utilized species such as whitefish, burbot, and pike.

A unique challenge in the lower river area is related to language and communication. 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.

AREA SALMON REPORT 1990

Subsistence Fishery 1990

Combined subsistence and personal use harvests during 1990 in the Yukon Area (excluding Yukon Territory) were estimated at 52,113 chinook, 118,471 summer chum, 182,033 fall chum and 47,816 coho salmon (Table 15). These figures include the harvest of chum salmon to produce roe sold in Upper Yukon Area districts, except for Subdistrict 4-A. The chinook salmon harvest was near the 1985-1989 average catch of 47,194 fish. Historical chinook salmon harvests by village are summarized in Appendix Table 27. The summer chum harvest (excluding commercial related harvest) was 33% below the recent 5-year average harvest of 176,383 fish (Appendix Table 29). The fall chum salmon harvest (including commercial related harvest) was 18% below the 1985-1989 average of 221,715 fish. The coho salmon harvest was 9% below the 1985-1989 average catch of 52,455 fish (Appendix Tables

28-31). Subsistence harvests taken through the use of permits in 1990 are summarized in Table 16 and historical permit catches in Appendix Table 32.

Lower Yukon Area

During 1990, an estimated 20,730 chinook, 68,750 summer chum; 13,638 fall chum and 10,679 coho salmon were harvested by fishermen representing 523 households for subsistence and personal use purposes in the Lower Yukon Area (Table 15). The catch of chinook salmon was 35% above the recent 5-year average. Catches of summer chum, fall chum, and coho salmon were 5%, 42%, and 9% below the recent 5-year averages, respectively.

Fall chum and coho salmon subsistence catches were probably slightly higher than reported because some fishing effort occurred after subsistence survey interviews were conducted.

Upper Yukon Area

The 1990 Upper Yukon Area combined subsistence and personal use salmon catch was estimated to be 31,383 chinook, 49,721 summer chum, 168,395 fall chum, and 37,137 coho salmon. Catches of chinook and fall chum salmon were 1% and 4% below the recent 5-year average, respectively. Coho salmon catches were 11% above the recent 5-year average. It is difficult to compare summer chum salmon subsistence harvests between years because of the interrelationship between use of fish for commercial roe production and for subsistence purposes.

Within District 4, an estimated 33,052 summer chum salmon were taken for subsistence use which were unrelated to commercial fishing activities during 1990. A total of 183,420 summer chum salmon were estimated to have been potentially available for subsistence use as a result of the 1990 commercial fishing activity in District 4. Subsistence surveys estimated the utilization of 96,273 District 4 summer chum salmon as food for dogs. There are still a number of summer chum salmon unaccounted for.

Canadian

In Canada, non-commercial harvests include Indian Food Fish and Domestic fisheries. These harvests occur in the Yukon River, and in the Porcupine River near the village of Old Crow. The Canadian non-commercial harvest was estimated to be 7,603 chinook and 6,085 fall chum salmon. An additional 300 chinook salmon were taken by sport fishermen. Sport fishing harvests of chinook salmon are included with Canadian non-commercial harvests in Table 15 and in Appendix Table 28.

Commercial Fishery 1990

In 1990, a total of 570,652 salmon in the round were commercially harvested in the Alaskan portion of the Yukon River (Table 4). The catch was composed of

95,361 chinook, 306,796 summer chum, 125,058 fall chum, 42,694 coho, and 743 pink salmon (Table 4). In addition, 109,376 pounds of summer chum roe, 1,731 pounds of chinook roe, 10,944 pounds of fall chum salmon roe, and 4,042 pounds of coho roe were sold by commercial fishermen. A total of 883 chinook, 5,325 summer chum, 7,060 fall chum and 1,426 coho salmon were sold by contracted fish wheel operators as part of a Department test fish project in District 6 (Table 13).

The chinook salmon catch was 18% below the recent 5-year average (1985-1989) and the lowest harvest since 1976. The summer chum salmon catch and roe production were 60% and 54% below the recent 5-year average, respectively. The fall chum salmon harvest in Alaska was 23% below the 1985-1989 average. The coho harvest was 22% less than the recent 5-year average. In the Canadian portion of the drainage, a commercial harvest of 11,324 chinook and 27,537 fall chum salmon was taken.

Yukon River fishermen in Alaska received an estimated $6,517,900 for their catch, approximately 26% below the recent 5-year average value. The first wholesale value of the 1990 pack was estimated at $16,294,750 (Appendix Table 24). Buyers and processors operating in the Yukon Area during 1990 are listed in Table 3. The majority of the salmon catch was processed primarily as a fresh/frozen product. Commercial salmon and salmon roe production data is presented in Appendix Table 23. Average prices paid to fishermen, and average salmon weights are presented in Appendix Tables 25 and 26, respectively.

In 1990, a total of 789 Commercial Fisheries Entry Commission (CFEC) gill net permits and 157 fish wheel permits (not including transfers) were issued (Appendix Table 7). Table 5 shows the residency of those issued CFEC permits for 1990. An estimated 716 gill net permits and 116 fish wheel permits were fished in 1990. The actual number of commercial fishing permits (fishermen) that made at least one salmon delivery by district during the season are shown in Appendix Table 8.

There was a lower than normal proportion of 6-year old chinook salmon (46.3%) in the commercial and subsistence harvests (Appendix Table 38). However, 4-year old fish comprised 21.8% of the catch, which was the highest proportion of age 4 fish for the years 1982-1990. There were also large numbers of age-4 fish observed in spawning ground surveys. It appears that there is a strong return from the 1986 brood year.

Samples collected from summer chum harvests resulted in an age composition of 37.4% 4-year-olds and 59.8% 5-year-olds. The results show a higher proportion of 5-year-olds compared to most other years (1982-1990). Fall chum salmon samples indicated that age 3, age 4, age 5 and age 6 fish comprised 2.9%, 74.9%, 21.8% and <1% of the harvest, respectively. Age-4 coho salmon dominated samples taken from Yukon River fisheries as observed in all other years (Appendix Table 38). However, the percentage of age-3 fish was greater than any other year since 1982.

Lower Yukon Area

The 1990 Lower Yukon Area (Districts 1, 2 and 3) commercial salmon catch totaled 468,451 fish which was comprised of 86,715 chinook, 282,061 summer chum, 68,225 fall chum, 30,707 coho salmon, and 743 pink salmon (Table 4).

Fishing effort, in terms of the actual number of participating fishermen (permit holders), is presented in Appendix Table 8. In 1990 a total of 718 CFEC gill net permits were issued for the Lower Yukon Area (Appendix Table 7). A total of 679 permit holders fished at least once during 1990. Lower Yukon fishermen were paid an average (per pound) of $2.84 for chinook, $0.24 for summer chum, $0.45 for fall chum and $0.66 for coho salmon. The approximate (ex-vessel) value of the harvest was $5.7 million. The average earnings per fisherman was approximately $8,390.

A total of 10 processors operated in the Lower Yukon Area in 1990. Nearly all of the commercial salmon catch was shipped to fresh or fresh/frozen markets. Two processors in District 1 hard-salted a total of 1,396 pounds of chum and coho salmon; and three half tierces of chinook salmon. Canning of salmon in the Yukon Area has not occurred since 1984.

Chinook Salmon

The mean April air temperature in Nome was 26 degrees fahrenheit which typically is indicative of early run timing (Appendix Table 39), however, chinook salmon migratory timing into the lower river appeared to be later than average. The Lower Yukon Area was generally free of ice by 28 May . The first chinook salmon was caught on 28 May by a subsistence fishermen at Sheldon's Point. The first chinook salmon was caught in department test fishing nets on 31 May. Based on commercial and department test net catches, the chinook salmon migration occurred primarily through south and middle mouths. Department test net catches of chinook salmon increased relatively slowly during the early portion of June compared to most other years. Approximately 50% of the chinook salmon return had entered the lower river by 18 June according to lower river test fishing data.

The 1990 chinook salmon return was unusual in regard to the large abundance of "jacks" present in commercial and department test net catches and the earlier entry pattern which they exhibited. Normally, smaller chinook salmon have later run timing compared to older, larger chinook salmon. The average weight of chinook salmon in the Lower Yukon Area commercial catch was 19.6 pounds, one of the lowest on record, indicating a high percentage of age-4 and age-5 males. The average weight of chinook salmon harvested during unrestricted mesh size fishing periods and restricted mesh size periods was 21.1 and 13.8 pounds, respectively.

The 1990 commercial salmon fishing season was opened by emergency order after approximately seven days of increasing subsistence and test net catches in the lower Yukon River. The chinook salmon directed fishery was opened on a staggered basis: 14 June in District 1, 18 June in District 2, and 24 June in District 3 (Tables 6, 7 and 8). All subsequent fishing periods were established by emergency order. The first commercial fishing period in Districts 1 and 2 was 9 hours in

duration because of uncertainty about chinook salmon run timing. Subsistence reports from 9 June through 12 June indicated a large build up of chinook salmon along the coast, however, test fishing catches remained relatively low. It appeared that chinook salmon would enter the river in a large compressed pulse.

The first commercial fishing periods coincided with the first large pulse of chinook salmon to enter the river. Because of the large chinook salmon harvest taken from the first pulse and due to the anticipated large return of summer chum salmon, the second period in Districts 1 and 2 was restricted to six inch maximum mesh size. The third period in Districts 1 and 2 were unrestricted mesh size openings. The cumulative chinook salmon harvest for Districts 1 and 2 combined following the second District 1 unrestricted mesh size period was 60,000 fish. Since the management plan called for switching to restricted mesh size gill nets when the harvest approached 60,000 fish, fishing time was reduced to 6-hours during the second unrestricted mesh size fishing period in District 2. There was no commercial fishing from 23 June through 27 June in District 1 and from 25 June through 28 June in District 2, due to the unexpectedly low abundance of summer chum salmon. As it became apparent that the summer chum return was either very late or much weaker than anticipated, fishermen were allowed to utilize unrestricted mesh size gill nets during the last two periods in Districts 1 and 2. This strategy was used to allow fishermen to target surplus chinook salmon and lessen the harvest of summer chums.

The total 1990 District 1 and 2 chinook salmon harvest during the summer season was 84,239 fish, 6% below the mid-point of the guideline harvest range and 22% below the 1985-1989 average harvest. A total of 66,092 chinook salmon were harvested during unrestricted mesh size fishing periods and 18,147 chinook salmon were harvested during restricted mesh size fishing periods. Primary areas of catch included middle mouth and Head of Passes. An additional 135 chinook salmon were captured during the fall chum salmon season.

In District 3, two unrestricted mesh size fishing periods (one 18-hour and one 9-hour) were allowed in 1990. The initial delay in opening District 3 allowed the first segment of the chinook salmon return to pass through the district prior to the commercial fishery. A total of 2,341 chinook salmon were harvested in District 3, which was 17% above the mid-point of the guideline harvest range, and 31% above the recent five year average.

Comparative 8.5 inch mesh size test net CPUE data indicated the 1990 chinook salmon return was most similar to the 1988 and 1989 returns. The catch of chinook salmon in 5.5 inch mesh size test nets was the largest ever. The estimated sonar passage of chinook salmon at Pilot Station was the largest since the project was initiated in 1986.

Summer Chum Salmon

The first summer chum salmon was caught in Department test fishing nets on 1 June. Similar to chinook salmon, the majority of summer chum salmon entered through the south and middle mouths.

A restricted mesh size fishing period directed toward summer chum salmon was implemented in Districts 1 and 2 after the first unrestricted mesh size fishing period in each district. These fishing periods of 12 hours duration were implemented in response to early indications of a large abundance of summer chum salmon, and following a large harvest of chinook salmon early in the chinook salmon return. A total of 148,768 summer chums were harvested in Districts 1 and 2 during these restricted mesh size fishing periods. After a short closure due to decreased passage of summer chum salmon, one six-hour restricted mesh size fishing period was allowed in District 2 on 29 June after test fishing data indicated an increase in abundance. However, this increase in abundance was short-lived and no more restricted mesh size fishing periods were allowed. A total of 99,588 summer chum salmon were harvested during unrestricted mesh size fishing periods, and 181,830 summer chum salmon were harvested in a total of three restricted mesh size fishing periods allowed in Districts 1 and 2, combined (Tables 6 and 7). This was the least amount of fishing time with six-inch maximum mesh size gill nets since 1973. The total District 1 and 2 commercial summer chum salmon harvest of 281,418 fish was near the lower end of the guideline harvest range (251,000 summer chum salmon). The harvest was 60% below the recent 5 year average and the lowest catch since 1972.

There were no restricted mesh size fishing periods in District 3 since the chinook salmon harvest exceeded the upper end of the guideline harvest range after two unrestricted mesh size fishing periods. The summer commercial fishing season closed 28 June. The District 3 summer chum salmon harvest was 643 fish, which was well below the recent 5 year average of 5,456 summer chums.

Comparative test net indices indicated the 1990 summer chum salmon return was below average in abundance and similar in magnitude to returns in 1982 and 1987. Approximately 50% of the summer chum salmon return had entered the lower river by 25 June according to test fishing cumulative CPUE data. The sonar project at Pilot Station estimated summer chum passage to be 937,000 fish, which was above the poor 1987 return, but well below the passage estimates of greater than 1.6 million fish in 1986, 1988, and 1989.

Fall Chum and Coho Salmon

An average return of fall chum salmon was expected in 1990 based upon evaluation of brood year escapements and assuming average survival. The primary contributor to the 1990 return was expected to be 4-year old fish produced by the 1986 parent year. A projection of the fall chum salmon return based upon an estimate of total parent year escapements, the average maturity schedule, and expected returns per spawner indicated the Lower Yukon commercial catch would be near the mid-point of the guideline harvest range (140,000 fish).

In 1990, fall chum salmon migratory timing into the lower river initially appeared to be early, with significant numbers of fish passing prior to 24 July. However, according to test fishing and sonar data, very low passage rates occurred from 24 July through 3 August. It was then apparent that run timing was later than normal. After 3 August, three pulses of fall chum entered the river during 4 August, 9-10 August, and 18-19 August. Coho salmon migratory timing

appeared to be later than normal as well. Consistent daily test net catches of coho salmon did not begin until 9 August, with no significant entry occurring until 17 August.

The 1990 fall season commercial salmon fishery was opened by emergency order on 23 July in District 1, 26 July in District 2, and 29 July in District 3. A fishing schedule of 12 hours duration in the coastal "Set Net Only Area" where tides affect fishing opportunity, and of six hours duration in the remainder of District 1 and in Districts 2 and 3 was established. The weather was calm during late July and early August, and catches were very low. Typically, fall chum salmon enter the river in relatively short pulses during windy weather.

A total harvest of approximately 50,000 fall chums had been taken as of 8 August, after five fishing periods each, in Districts 1 and 2, and four periods in District 3. However, cumulative sonar passage estimates were lagging behind all other years for this date. Historical test fishing and sonar data suggested that usually by 10 August, 50% of the run has passed. In response to what appeared to be a below average fall chum salmon return, the lower river districts were closed to commercial fishing until further notice, in order to allow increased fish passage for spawning and upriver subsistence requirements.

Sonar counts at Pilot Station for 10-16 August, 1990 were adjusted on 17 August to account for targets identified in mid-river transects conducted beyond the horizontal counting range. Apparently, very low water levels caused a change in the migration pattern which had not been seen in prior years. Since the return was still judged to be late and below average in abundance, it was decided to allow only one further commercial period in Districts 1, 2, and 3 to allow the harvest to approach the lower end of the guideline harvest range. In addition, the coho salmon return appeared to be increasing as indicated by lower river test fishing catches.

The commercial fishing season closed by emergency order on 21 August in Districts 1, 2, and 3. A total of 68,225 fall chum and 30,707 coho salmon were harvested (tables 6,7 and 8). This was the second consecutive year in which District 2 had a larger fall chum salmon harvest than District 1, although the harvest has been nearly equal in some other years. The preliminary cumulative sonar fish passage estimates at Pilot Station through termination of the project on 4 September were approximately 482,000 fall chum and 230,000 coho salmon.

Upper Yukon Area

The Upper Yukon Area commercial salmon harvest totaled 8,646 chinook, 24,735 summer chum, 56,833 fall chum and 11,987 coho salmon in 1990 (Table 4). In addition, roe sales by species totaled 1,731 pounds for chinook, 109,376 pounds for summer chum, 10,944 pounds for fall chum, and 4,042 pounds for coho salmon. With regards to fish sold in the round, the chinook salmon catch was 18% below the 1985-89 average; summer chum, 59% below average; fall chum, 23% below average; and coho salmon, 26% below average. Roe sales were 54% below the 1985-89 average for summer chum salmon, and 2.6 times greater than the 1985-89 average for fall chum salmon. Note that the five year averages for fall chum salmon and roe production includes 1987, when the commercial fishery was closed. Roe sales

data were not previously available by species for chinook and coho salmon, therefore harvest levels for 1990 cannot be compared to historical information.

Salmon production data is expressed as number of fish sold in the round, and pounds of unprocessed roe which were sold. Table 14 and Appendix Table 6 present total estimated commercial related chum salmon catch by district during 1990. These catch figures reflect the estimated incidental catch of male summer chum salmon which were not sold and the estimated number of female chums harvested during the roe fishery in the Upper Yukon Area. Table 12 presents commercial salmon catch by gear type (set gill net and fish wheel).

A total of 13 buyer/processors and 10 catcher-sellers operated during 1990. Upper Yukon commercial fishermen received an estimated (per-pound average price) of $0.66 for chinook, $0.15 for summer chum, $0.26 for fall chum, $0.28 for coho salmon; and $4.42 for summer chum roe, and $3.64 for fall chum salmon roe (Appendix Table 25). The approximate (ex-vessel) value of the 1990 harvest was $824,000 which includes approximately $523,000 (64%) paid to fishermen for salmon roe sales. During the 1990 season, 153 upper Yukon fishermen participated in the commercial fishery. The average earnings per fisherman was approximately $5,386, and ranged from $ 2,302 in District 5 to $7,357 in District 6.

Chinook Salmon

In District 4, the chinook salmon harvest is largely incidental to the directed summer chum salmon fishery. The summer chum harvest was allowed to reach the lower end of the guideline harvest ranges for this district. The majority of the chinook salmon catch occurred in Subdistricts 4-B and 4-C. The harvest of 3,536 chinook was 686 fish (20%) above the 2,850 fish upper guideline harvest range (Table 9).

In District 5, chinook salmon is the primary species of commercial value during the early season due to the low availability and relatively poor flesh quality of chum salmon. Commercial fishing periods were scheduled when the bulk of the run was in the district in order to reduce the impact on individual stocks. Three fishing periods (two 48-hour and one 24-hour) occurred in Subdistricts 5-A, 5-B, and 5-C in 1990 for a total harvest of 2,810 chinook salmon and 47 pounds of chinook salmon roe, and within the guideline harvest range of 2,250 to 2,850 fish (Table 10). Two fishing periods (one 48-hour and one 24-hour) occurred in Subdistrict 5-D for a harvest of 543 chinook salmon, which was just slightly over the upper end of the guideline of 500 fish.

Historically, the chinook salmon harvest in District 6 has been largely incidental to the directed summer chum salmon fishery due to the low harvest guideline for chinook salmon (600 to 800 fish). Since 1988, the opening of the commercial fishing season has been delayed to allow increased escapement from the early portion of the return. The Board of Fisheries has directed that the Tanana River may be managed as a terminal commercial fishery if escapements are insured and the subsistence priority is not jeopardized. The first 42-hour fishing period in 1990 occurred on 13 July, with a record harvest of 1,437 chinook salmon and 970 pounds of roe (Table 11). The second period was delayed until 23 July due to escapement concerns for the Chena River stock. Total District 6

commercial harvest was 1,757 chinook salmon and 1,676 pounds of chinook salmon roe which were taken in five 42-hour periods.

Summer Chum Salmon

In District 4, the season opened on 24 June, 1990 with a 24-hour fishing period followed by two standard 48-hour fishing periods (Table 9). After these three periods, the season harvest goal was lowered to the lower end of the guideline harvest range due to inseason assessment of a below average return. Subdistrict 4-A had one additional 24-hour fishing period, and was then closed with a summer season harvest of 11,177 summer chum salmon and 95,541 pounds of summer chum salmon roe. Subdistricts 4-B and 4-C continued fishing for three additional 48-hour periods, for a total of six fishing periods, and closed after a harvest of 1,187 summer chum and 10,182 pounds of summer chum salmon roe.

In District 5, summer chum salmon are caught incidentally to the chinook salmon fishery. A total of 11 summer chum salmon and 594 pounds of summer chum salmon roe were sold (Table 10).

In District 6, there were five 42-hour commercial fishing periods during the summer season. A total of 16,407 summer chum salmon and 3,059 pounds of summer chum salmon roe were sold (Table 11).

Fall Chum and Coho Salmon

Based on test net, sonar, and commercial and subsistence fishery performance, it was determined that the fall chum salmon run size was sufficient to allow upriver districts to harvest near the lower end of their guideline harvest ranges. Subdistricts 4-B and 4-C were opened to commercial fishing for two 48-hour periods beginning on 22 August. Participation by fishermen and processors was at a low level due to the late opening announcement and low harvest goal of 5,000 fish. Sales totaled 4,989 fall chum salmon and 2,351 pounds of fall chum salmon roe. No coho salmon were reported sold.

The Subdistrict 5-A, 5-B, and 5-C fall season was announced for two 24-hour periods per week beginning on 28 August, 1990. However, the low end of the guideline harvest range of 4,000 fish was exceeded with the sale of 5,169 fall chum salmon and 945 pounds of roe after only one fishing period. Subdistrict 5-D was also open for only one fishing period due to the lower end of the guideline harvest range of 1,000 fish being exceeded in one 48-hour period. Sales from the 7-9 September fishing period were 2,609 fall chum salmon and 113 pounds of roe. No coho salmon were reported sold in District 5.

Based on sustained high catches in test fish wheels and the subsistence fishery, the fall chum salmon run in the Tanana River (District 6) was assessed to be above average in strength. Three fishing periods were allowed in each subdistrict in District 6 in 1990. Due to Board of Fisheries concerns for the Toklat River fall chum salmon stock, fishing periods in Subdistrict 6-A were 24-hours in duration, while they were 42-hours in Subdistricts 6-B and 6-C. Sales for District 6 totaled 49,989 fall chum salmon, 7,392 pounds of fall chum salmon roe, 12,464 coho salmon, and 3,888 pounds of coho salmon roe.

Canadian

The 1990 management plans for the Canadian chinook and fall chum salmon fisheries on the Yukon River were formulated to reflect the understandings reached in the latest round of United States and Canada negotiations, which were held in Juneau during the week of 23 April, 1990. Accordingly, the guideline harvest ranges and border and spawning escapement goals tentatively agreed to in Juneau provided the foundation for the Canadian 1990 management plans.

The Canadian commercial fishery harvested a preliminary total of 38,861 salmon in 1990 which was composed of 11,324 chinook salmon and 27,537 fall chum salmon (Table 17). The chinook catch was similar to the recent chinook salmon cycle (1984-89) average catch of 11,188 fish, whereas the fall chum salmon catch was above the recent chum salmon cycle (1986-89) average of 24,967 fish. A total of 30 commercial licenses was issued in 1990, similar to 1989.

Chinook Salmon

The elements of the chinook salmon Canadian management plan adopted for 1990 included:

a) a minimum Canadian spawning escapement goal of 18,000 chinook salmon;

b) a total Canadian Yukon River mainstem Guideline Harvest Range for all users of 16,800 to 19,800 chinook salmon;

c) a commercial Canadian Guideline Harvest Range of 9,400 to 12,400 chinook and a pre-season target of the midpoint (10,900 chinook); and,

d) a one day per week fishery for the initial two weeks of the season, followed by four-day per week fishing periods for the remainder of the chinook season subject to the harvest guideline. This marked a 50% reduction in fishing time during the first two weeks of the season. The change from 1 day per week openings to 4 days per week openings was to occur two weeks after the run commenced. One additional day per week would be allowed in the upper fishing district, upstream of the Sixty Mile River.

The total Canadian commercial chinook salmon catch was 11,324 fish in 1990. The commercial catch fell within the commercial guideline harvest range of 9,400 to 12,400 chinook salmon. The recent six year average (1984-89) commercial catch was 11,188 chinook salmon. The lowest catch in this period occurred in 1989 with a commercial catch of 9,789 chinook salmon. The record Canadian commercial catch occurred in 1988 with 13,217 chinook salmon.

Fall Chum Salmon

The conservation initiatives undertaken in 1989 were continued in 1990 for Canadian Yukon mainstem fall chum salmon. The fall chum salmon management plan included the following components:

a) a spawning escapement objective of 81,600 Canadian Yukon mainstem chum salmon. This was the weighted average of the principal brood year escapements, 1985 and 1986. In the absence of an escapement objective agreed to by both Canada and the U.S., it was Canada's intent to set an escapement objective at this level so brood stock levels could be maintained;

b) a guideline harvest range for all Canadian Yukon mainstem fisheries of 23,600 to 32,600 fall chum salmon;

c) a Canadian commercial guideline harvest range of 20,900 to 29,900 fall chum salmon with a pre-season target of the midpoint, ie. 25,400 fall chum salmon; and,

d) reduced fishing time (two days per week) for the first two weeks of the chum season, followed by four day per week openings subject to assessments of run strength and the guideline harvest ranges.

The Canadian commercial fall chum harvest was within the guideline harvest range of 20,900 to 29,900 fish with a total catch of 27,537 chum. The pre-season target of 25,400 fall chum salmon for the Canadian commercial fisheries was exceeded due to the indications of a strong return in both the commercial and test fish wheel catches. The 1990 chum catch was about 10% above the recent cycle (1986-89) average of 24,967 chum, which ranged from 17,549 in 1989 to a record of 40,591 in 1987. A maximum of 15 fishermen were active in any one week during the chum salmon season.

Escapement 1990

Among the comprehensive escapement enumeration studies conducted in 1990 to more completely estimate total abundance of spawners, hydroacoustic techniques were employed to monitor chum salmon escapements to the Anvik, South Fork Koyukuk (operated by USF&WS), Chandalar (operated by USF&WS), and Sheenjek Rivers. While replicate ground surveys and stream life data were used to estimate abundance of chum salmon spawners in the Delta River, mark-and-recovery studies were conducted by the Sport Fish Division to generate population estimates for chinook salmon spawners in the Chena and Salcha Rivers. The Sport Fish Division also installed a weir in the Chatanika River in 1990. Although the main objective of the project was to monitor timing and strength of the upstream spring migration of whitefish species, passage of chinook and chum salmon was also monitored.

In addition to the site specific studies mentioned above, the Department also monitored salmon abundance by species in the mainstem Yukon River near Pilot Station by hydroacoustic methods for the sixth consecutive year. A similar,

feasibility sonar project was initiated on the Tanana River in 1990 approximately 12 river miles downstream of Manley Hot Springs.

Projects conducted by the Canadian Department of Fisheries and Oceans (DFO) consisted of a mark-and-recovery project near the U.S. and Canada Border to estimate the total number of chinook and chum salmon entering Yukon Territory as well as manning an enumeration window and passage gate at Whitehorse to monitor chinook salmon escapement upstream of Whitehorse.

Remaining escapement information throughout the Yukon River drainage in 1990 was obtained primarily by aerial surveillance and occasional ground surveys. In general, survey conditions were extremely poor throughout much of the Alaskan portion of the drainage during the chinook and summer chum salmon survey season from mid July through August. This was particularly so in that portion of the drainage between the villages of Kaltag and Circle, including the lower Koyukuk and portions of the Tanana river drainages, where extremely dense smoke from numerous wildfires scattered throughout Interior Alaska severely restricted visibility during targeted survey dates.

By comparison, survey conditions for chinook and summer chum salmon were slightly improved in the lower (downstream from the village of Kaltag) Yukon River drainage. The best conditions in 1990 prevailed in the Canadian portion of the drainage (Yukon Territory) where all chinook salmon aerial index streams were successfully surveyed.

Few difficulties with inclement weather or availability of survey aircraft were encountered in surveying most fall chum and coho salmon index areas.

Escapement estimates obtained in 1990 are shown in Table 18 while Figures 14 through 18 show major Yukon River tributary systems.

Chinook Salmon

Appendix Tables 33 and 34 present historic chinook salmon escapement data for selected streams during the period 1961-1990. Interim chinook salmon escapement goals established by the Department for eight Alaskan streams are: East (1,600) and West Fork (1,000) Andreafsky, Anvik (500), North (500) and South Fork (500) Nulato, Gisasa (650), Chena (1,700), and Salcha (2,500) Rivers (Table 19). The Salcha River objective was revised to 2,500 spawners prior to the 1990 fishing season. These escapement goals are based upon aerial survey index counts which do not represent total escapement. Although no escapement objectives have been established for individual Canadian streams, an interim escapement objective of 33,000-43,000 chinook salmon spawners for the mainstem upper Yukon River drainage (Yukon Territory) was established by the Yukon River Joint Technical Committee (JTC) in March 1987.

Overall, chinook salmon spawning escapements throughout the entire Yukon River drainage were assessed as good; in most cases meeting established escapement objectives. The estimated sonar passage of chinook salmon at Pilot Station between June 5 and July 19 was the largest since the project was initiated (approximately 130,000). However, species apportionment was calculated

differently in 1990 and additional analyses are being completed to allow comparison with other years.

Aerial surveys in the lower portion of the Yukon River drainage documented 2,503 chinook salmon in the East Fork and 1,545 in the West Fork Andreafsky River, and 1,595 in the Anvik River index area. Thus, escapement objectives were met in all of these rivers. Although the majority of aerial surveys flown of index streams throughout the middle Yukon River drainage were rated poor, observations still indicated good spawning escapements were realized. For example, a poor survey of the North and South Fork Nulato Rivers still resulted in counts of 568 and 430 chinook salmon, respectively. The interim goal for each of these rivers is 500 spawners. Similarly, a poor survey of the Gisasa River revealed at least 884 chinook salmon were present. The interim objective for that stream is 650. Chinook salmon escapements in the upper Koyukuk River drainage were also judged good as evidenced by the 369 observed in Henshaw Creek and 288 in the South Fork Koyukuk and Jim Rivers. A count of 185 chinook salmon on a poor survey of the Kateel River was the highest ever recorded in that stream. A fair survey of the Tozitna River resulted in a chinook salmon count of 149 fish.

The number of chinook salmon observed spawning in the Chena and Salcha Rivers is used to assess escapement to the Tanana River drainage. Whereas, only 1,402 chinook salmon were observed in the Chena River between Moose Creek Dam and Middle Fork Chena River (index area), observer conditions in the lower section of this area were rated as poor due to water turbidity problems. Although the count is approximately 300 fish shy of the objective (1,700), the Sport Fish Division estimated the total spawning population to be approximately 5,600 chinook salmon. In the Salcha River aerial index area (Transalaska Pipeline crossing upstream to Caribou Creek), 3,429 chinook salmon were observed under good survey conditions on July 27. The mark-and-recovery population estimate made for chinook salmon spawners in the Salcha River in 1990 by Sport Fish Division was approximately 10,700 fish. Although considered a "secondary" index stream, a survey of the Goodpaster River in 1990 documented 510 chinook salmon present, the highest on record for that stream.

The DFO mark-and-recovery population estimate of chinook salmon entering the Canadian portion of the mainstem Yukon in 1990 was approximately 56,700, the highest on record since tagging studies have been conducted (1982). Subtracting the estimated Canadian commercial and non-commercial harvest (19,000 excluding Old Crow) from this population estimate results in a total spawning escapement estimate to Yukon Territory (excluding the Porcupine River drainage) of approximately 37,700 chinook salmon; falling within the interim spawning escapement objective range of 33,000-43,000 fish.

Aerial surveillance of Yukon Territory chinook salmon spawning streams in 1990 was quite limited and primarily conducted by the Department due to severe budget reductions in DFO funding. However, all major chinook salmon aerial index areas were successfully surveyed and results were to compliment subsequent results of the DFO tagging study. The general finding was that spawning escapements were very good, often rivaling years of some of the highest escapements on record (particularly 1981). Chinook salmon escapement to the Big Salmon River rivaled that observed in 1981, the largest on record for that stream. Likewise,

escapement to the Little Salmon River paralleled the observed 1981 level in that stream, being exceeded only in 1989.

Although chinook salmon escapement to the Teslin River drainage as typified by counts in the Nisutlin and Wolf Rivers was good, comparatively it was somewhat lower than that observed in the Big and Little Salmon Rivers. Escapements were very similar to that observed in 1989, the highest observed since 1984. However, the combined observations to these streams in 1990 represented roughly 44% of the 1981 record escapement levels.

Although data on chinook salmon escapement are limited for the Ross River, observations suggested a fairly good escapement was realized in 1990. A total of 300 spawners was documented on August 17 but under poor survey conditions. The highest escapement on record was recorded in 1981 (822 fish). However, 157 spawners were observed in the outlet of Lewis Lake in 1990, whereas only 105 were documented in 1981, further suggesting good chinook salmon escapements were realized to the Ross River drainage in 1990. By contrast, a survey of the Hoole River revealed "average numbers" of chinook spawners present that stream.

The number of chinook salmon which returned to the Whitehorse fishway in 1990 totaled 1,407, rivaling the largest return on record of 1,539 in 1981. However, at least 21% of the fish which returned were estimated as having been from previous hatchery releases. From the total chinook salmon returning to the fishway in 1990, only 1,236 were passed upstream; the remainder being taken for hatchery brood stock.

Summer Chum Salmon

Appendix Table 35 presents historic summer chum salmon escapement data for selected streams during the period 1973-1990. Interim escapement goals for six major summer chum spawning streams in the lower Yukon River drainage are: East (109,000) and West Fork (116,000) Andreafsky, Anvik (487,000), North Fork Nulato (53,000), and the Hogatza (17,000 - Clear Creek at 8,000 and Caribou Creek at 9,000) Rivers. An additional escapement objective of 3,500 summer chum salmon exists for the Salcha River in the Tanana River drainage. With the exception of the Anvik River objective which is an "optimum" goal based upon spawner/return relationships, all other objectives are based upon aerial survey observations during periods of peak spawning. The corresponding objective for the Anvik using this latter technique is 356,000 chum salmon between Goblet Creek and McDonald Creek.

Unfortunately, the very poor survey conditions encountered in 1990 severely limited aerial assessment of summer chum salmon spawning escapements. This was especially disappointing considering the run appeared below average in magnitude based upon inseason performance of commercial and test fisheries. However, the limited observations made regarding summer chum escapement tended to corroborate this. The Yukon River sonar project at Pilot Station estimated a passage of approximately 936,000 summer chum salmon from June 5 through July 19. Although this number was greater than the poor return experienced in 1987 (sonar passage 687,000), it was well below the sonar passage in years which exceeded 1.6 million fish (1985, 1986, 1988, and 1989). Further, the preliminary Anvik River sonar

estimate of approximately 400,000 chum salmon through July 29 was nearly 18% below the optimum objective of 487,000 fish and the lowest observed since 1983.

The East Fork Andreafsky River tower project has not operated since 1988 due to budget constraints and aerial survey effort was hampered by inclement weather in 1990. The only observations available are from an aerial survey flown on July 21. Approximately 162,000 live and 13,000 dead salmon were estimated present. However, the observer could not differentiate between chum and pink salmon. Similarly, approximately 87,000 live and 6,000 dead salmon were estimated in a survey of the West Fork Andreafsky River with no species apportionment made. Thus, no reliable chum salmon escapement estimates are available for these important spawning areas.

Access to most major summer chum salmon spawning streams in the middle Yukon and lower Koyukuk River drainages were hindered during periods of peak spawning from inclement weather or severe smoke conditions from wildfires; most observations being made after peak spawning. These surveys indicated below average numbers of summer chum salmon.

The only summer chum salmon index stream successfully surveyed in the Tanana River drainage in 1990 was the Salcha River; a good survey on July 27 resulted in a count of only 450 chum salmon. Although the survey was flown about 3 days prior to the targeted survey dates for that stream, it is unlikely a good escapement was realized.

Fall Chum Salmon

Appendix Table 36 presents historic fall chum salmon escapement data for selected streams since the early 1970's. Total Yukon River fall chum salmon escapements are evaluated based upon escapement observations to four major spawning streams: Delta, Toklat, Sheenjek, and Fishing Branch Rivers. Interim escapement objectives for these four streams are 11,000, 33,000, 62,000, and 50,000-120,000 fall chum salmon, respectively. These interim objectives are of total abundance which were based upon expansion of inseason point estimates. Using the low number (50,000) in the objective range for the Fishing Branch River, the total 4-area index escapement objective is considered as 156,000 fall chum salmon.

The overall projected return of fall chum salmon to the Yukon River in 1990 was 784,000 fish; slightly below the 1974-1989 estimated average of approximately 811,000. Distribution and strength of various spawning stocks throughout the Yukon River drainage was anticipated to be quite variable, based upon an analysis of brood year escapements. For example, a poor return of fall chum salmon to the Tanana River drainage was expected while near to slightly above average returns were projected for the Sheenjek and upper mainstem Yukon Rivers. In brief, the 4-area escapement index in 1990 totaled approximately 135,385 fall chum salmon, falling approximately 24,200 fish short of the 4-area objective of 156,000.

Lower Yukon River inseason assessment of the 1990 fall chum salmon return was below average in strength and late in run timing. Only an approximate 68,000 fish were commercially harvested in the lower 3 fishing districts, being nearly 39% below the most recent 5-year average harvest in those districts (112,000).

A preliminary sonar estimate of 485,083 fall chum salmon (90% C.I. = 451,569 to 518,597) passing Pilot Station was made for the period 19 July to 4 September, the lowest since initiation of the project in 1985.

Similarly, the preliminary population estimate of fall chum salmon entering the Canadian portion of the upper Yukon River made by DFO was approximately 81,700 fish. Subtracting the preliminary estimated Canadian commercial and non-commercial harvest (31,200 excluding Old Crow) from this population estimate results in a total escapement estimate to Yukon Territory (excluding the Porcupine River drainage) of approximately 51,700 spawners. This estimate is nearly 15% below the most recent 5-year average of 60,700. An aerial survey estimate of spawners in the Kluane River was approximately 4,400, while 3,500 were estimated in the mainstem Yukon River spawning between Fort Selkirk and Tatchun Creek.

Fall chum salmon escapement to the Porcupine River system was evaluated by observations made in the Sheenjek and Fishing Branch Rivers. The preliminary sonar-estimated escapement to the Sheenjek River in 1990 was approximately 65,700 chum salmon. Although this is a minimal estimate, since fish were known present prior to sonar operations as well as being passed at a rate of nearly 1,000 per day upon project termination, the escapement objective (62,000) was achieved. By comparison, it is not believed that the Fishing Branch interim objective of 50,000 fish was reached in 1990 based upon limited observations. Due to budget constraints, DFO did not operate a weir on this river in 1990, but rather conducted a single aerial survey on 26 October to estimate the number of spawners present. Although only 7,541 chum salmon were estimated present, a population estimate of approximately 27,000 chum salmon was made through the date of the survey, based upon an historic average aerial-to-weir expansion of 28%. Actual population of spawners in 1990 was reported by DFO to likely have been between 30,000-40,000 in view of the late timing of the survey with respect to spawning.

Comprehensive escapement enumeration of fall chum salmon in the Chandalar River was undertaken for the fifth consecutive year in 1990 by the USFWS. Although no interim escapement objective exists for this stream, the sonar-estimated escapement of 78,631 fish was the highest observed since hydroacoustic operations were initiated in 1986.

By comparison to the upper Yukon River region, test wheel results in the Tanana River indicated 1990 fall chum salmon run strength to be stronger than anticipated to that drainage; even exceeding performance of the test wheels in 1989 when a strong fall chum salmon run was realized. Once judged reasonably certain that escapement objectives and subsistence needs would be met in the Tanana River, additional fishing time was allowed in that district (District 6) which resulted in a record commercial harvest of approximately 50,000 fall chum salmon. Escapement success varied.

Escapement to the Toklat River in 1990 was estimated at approximately 33,700 fall chum salmon, the highest observed since 1979 and the first year the escapement objective (33,000) has been achieved during the past decade. By comparison, the Delta River escapement estimate of approximately 9,000 spawners fell 2,000 fish shy of the objective for that river. Although no escapement objectives exist for other fall chum salmon spawning areas in the upper Tanana River, observations to

prominent spawning areas in the Big Delta region (e.g., Bluff Cabin and Clearwater Lake Outlet Sloughs) indicated less than expected numbers of spawners based upon inseason fishery performance.

Finally, the USFWS initiated a hydroacoustic enumeration project in 1990 on the South Fork Koyukuk River near the confluence of Fish Creek and estimated 20,081 chum salmon passing between 25 July and 30 September. This represents the first major effort to thoroughly monitor fall chum escapement in this drainage.

Summation of the 1990 preliminary estimated fall chum salmon in river commercial and subsistence harvests (347,773) together with estimated spawning escapement (270,770) reveals total run size to have been on the order of magnitude of 618,543 fish. The 1990 fall chum salmon pre-season projection was 784,000.

Coho Salmon

The 1990 preliminary sonar estimate of coho salmon passing Pilot Station through September 4 was 231,714. Spawning escapements in the Tanana River drainage as reflected by observations made of selected index areas in the lower Nenana (Lost Slough) and upper Tanana Rivers (Delta Clearwater River and Clearwater Lake outlet stream) were judged to be at least average in magnitude (Appendix Table 37).

A previously undocumented coho salmon spawning area was identified in the mainstem Nenana River on 10 October, 1990. An estimated 1,308 coho salmon spawners and numerous redds were observed in an approximate 8-mile stretch of the mainstem Nenana River, immediately upstream of the Teklanika River mouth. Water was extremely clear and the area appeared to be spring fed. This area was subsequently nominated for inclusion in the State's *Catalog of Waters Important for Spawning, Rearing, and Migration of Anadromous Fish.*

Enforcement 1990

The primary enforcement authority for violation of Fish and Game regulations is the Division of Fish and Wildlife Protection within the Department of Public Safety. For purposes of enforcing commercial and subsistence fishing regulations within the Yukon River drainage, the Division of Fish and Wildlife Protection has employees permanently stationed in McGrath, Aniak, Galena, Coldfoot, and Fairbanks. During the fishing season, officers are stationed in a temporary camp near the Dalton Highway bridge and at other locations along the Yukon and Tanana Rivers.

Lower Yukon Area

Fish and Wildlife Protection officers conducted intensive patrols in the Lower Yukon Area during June 1990. Approximately 120 commercial fishing citations were issued. These violations entailed fishing just prior to openings and shortly after periods closures. The remaining cases were for unmarked gear, no photo identification, no crewmember license, etc. There is no complete breakdown of the citations which were issued available at this time.

Upper Yukon Area

There are nine Department of Public Safety, Division of Fish and Wildlife Protection Officers based out of the Fairbanks and Galena offices. During the 1990 Upper Yukon Area fisheries, Fish and Wildlife Protection officers concentrated enforcement efforts on permit holders who were fishing over limits of gear, or not physically participating in the operation of their commercial gear. Several citations were issued for these regulation violations.

Overall, Fish and Wildlife Protection Officers noticed good compliance with season openings and closures during routine patrols. With the exception of during the late fall season, several subsistence fishermen were cited or given warnings for subsistence fishing during closures. Additionally, a complication with the wording of a regulation did occur with the enforcement of the recently established subsistence salmon closure on the Kantishna River. The regulation closes the river to the taking of chum salmon; however, fishermen were able to continue to fish for coho salmon.

Fish and Wildlife Protection officers continue to be concerned and active in the investigation of roe from subsistence caught fish illegally entering into the commercial market. However, the amount of roe entering the commercial market this way is believed to have been significantly reduced from prior years.

OUTLOOK FOR 1991

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. In general, spawning escapements in 1985, the primary brood year (age 6 in 1991), were judged to be below average in magnitude in Canada, and average in Alaska. It is expected that the 1991 return of 5-year-olds will be average based on escapements which ranged from below average in Canada to above average in Alaska during 1986, and above average proportion of 4-year-old fish in the 1990 return. The return of 7-year-old fish (1984 year class) is expected to be average as the return of this year class in 1990 as 6-year-olds was average. Overall, the 1991 chinook salmon return is anticipated to be below average to average in strength. The commercial harvest in Alaska is expected to total 83,000 to 100,000 chinook salmon (77,000-93,000 fish in the Lower Yukon Area, 6,000-7,000 fish in the Upper Yukon Area).

Summer Chum Salmon

Summer chum salmon return primarily as 4-year-old fish, although substantial 5-year-old returns can result from brood years with high survival rates. The return of 4-year-old fish in 1991 will be dependent on production from the 1987 brood year. Based on available catch and escapement data, the magnitude of the

1987 summer chum salmon run was judged to be below average in abundance. In addition, the return of 5-year-old fish in 1991 is expected to be below average in strength based upon the below average return of 4-year-old fish in 1990. 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 1991 will be below average in magnitude. The commercial harvest is expected to be near the lower end of the river-wide guideline harvest range (400,000-600,000 fish; 70,000-100,000 pounds of roe).

Fall Chum Salmon

Similar to summer chum salmon, fall chum salmon return primarily as 4-year-old fish. Escapements in 1987 (the brood year which will produce 4-year-old fish in 1991) were generally above average. This suggests an average to above average return of 4-year-olds in 1991. The return of 5-year-old fish (1986 brood year) is expected to be below average, overall, based on the low contribution of age 4 fall chum salmon in the 1990 harvest, and the below average to average escapements in 1986. In summary, based on evaluation of brood year escapements, and assuming average survival rates, the overall fall chum salmon return is expected to be average to above average in 1991. The commercial harvest is anticipated to range from 200,000 to 300,000 fall chums (approximately 140,000-206,000 in the Lower Yukon Area, and 60,000-94,000 fall chum and coho salmon combined in the Upper Yukon Area).

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 system indicated above average run strength in 1987. The commercial harvest is expected to approach 90,000 fish, and will be dependent on the timing and frequency of fishing periods allowed for fall chum salmon.

CAPE ROMANZOF DISTRICT HERRING FISHERY

Commercial Fishery 1990

The Pacific herring commercial fishing season consisted of one period which was established by emergency order during 23-24 May for a total fishing time of 3 hours. A total harvest of 329 short tons (st) was taken by 95 fishermen utilizing 90 fishing vessels (Table 20). The entire harvest was taken from Kokechik Bay. The overall exploitation rate could not be calculated during the fishery due to the lack of an inseason biomass estimate. For this reason, the commercial harvest was managed to achieve the preseason guideline harvest.

The majority of the harvest was taken as sac roe (318.2 st); only 10.8 st was purchased as bait. Average roe recovery was 8.4%. Wastage of Pacific herring was not a problem, however, several nets were lost during the season.

Estimated value of the harvest to fishermen was $154,940. Average price for Pacific herring sac roe was $566 per st at 10% roe recovery plus or minus $49.00 a percentage point. Four companies purchased herring in the Cape Romanzof District this season (Appendix Table 41). A total of 95 fishermen participated in the fishery. This was the lowest effort recorded since 1985, and was 17.4% below the 1989 effort level. Fishing effort by residency status was as follows: 72 (75.8%) were local Alaskan residents (residents of Chevak, Hooper Bay and Scammon Bay); 21 (22.1%) were non-local Alaskan residents; and 2 (2.1%) were non-residents. Catch by residency status was 252.5 st at 8.3% average roe by local Alaskan residents (76.7% of the catch); 68.4 st at 8.0% average roe by non-local Alaskan residents (20.7% of the catch); and 8.1 st and 9.9% average roe (2.5% of the catch) by non-residents.

The overall exploitation rate of Pacific herring was estimated postseason to be approximately 7.3% of the available biomass. Age composition information (by weight) indicated age 8 and older Pacific herring comprised approximately 67.0% of the total harvest. Age 4,5,6 and 7 herring comprised approximately 1.9%, 2.1%, 18.0% and 10.5% of the harvest, respectively.

In coordination with the Department, commercial fishermen provided catch samples for evaluation by industry representatives prior to opening the fishery. Roe recovery information indicated the presence of immature fish during the first "beach party" on 22 May. Two "beach parties" were held on 23 May in an attempt to sample each incoming tide. With spawned-out fish present in the samples from the first incoming tide of 23 May, it was the consensus of the ADF&G management staff as well as the local fishermen that the fishery was imminent. At this time, the commercial fleet was put on one hour advance notice, and a second sample time was scheduled for 9:30 p.m. on 23 May. This time was selected to get samples to the beach for industry analysis, and still allow enough time to provide a one hour notice prior to opening the fishery. At preseason meetings, local fishermen expressed the desire for the Department to schedule the commercial fishing periods during incoming tides. Roe percentages of the samples collected in the evening on 23 May ranged from 11% to 16% for 3 inch mesh and from 7% to 9% for 2 3/4 inch mesh.

The average roe recovery from the commercial fishing period established on 23-24 May was only 8.4%. In retrospect, the sample collected during the incoming tide the evening of 23 May not have been representative of the fish available to the commercial fleet during the opening of 23-24 May since it was collected early in the tidal stage.

Seven Fish and Wildlife Protection (FWP) officers were present on the Cape Romanzof fishing grounds during the 1990 Pacific herring commercial fishing season. These officers were supported by the Protection Vessel (P/V) Wolstad, two skiffs, two fixed wing aircraft, and one helicopter. A total of five commercial fishing citations were issued. All commercial fishing citations were issued for fishing during closed periods. Two deliveries totaling 4,466 lbs of Pacific herring and one shackle of gear were confiscated.

Subsistence Fishery 1990

A subsistence harvest estimate of 7.9 st of Pacific herring was reported to have been taken by 32 fishing families from Hooper Bay, Chevak, and Scammon Bay (Appendix Table 42). The subsistence harvest survey was conducted through the mail by a catch questionnaire. About 21% of the questionnaires were returned. A majority of the fishermen that responded to questionnaires reported more herring were present during 1990, than in 1989. The subsistence catch figures represent only the harvest which was reported. Therefore, the reported catch is a minimum estimate since not all families were mailed questionnaires and not all families which received questionnaires returned them.

Herring Abundance

Five aerial surveys were flown during the 1990 season on May 12, 23, 26, 27 and on 1 June. During all surveys turbid water prevailed within Kokechik and Scammon Bays. All surveys flown during May were unacceptable due to weather and turbid water conditions. No herring were observed on the survey flown under poor conditions on 1 June.

Test fishing was conducted from 17 May to 6 June, 1990. A total of 2,220 Pacific herring were caught, of which 1,122 samples were used for biological data. Pacific herring comprised approximately 69.0% of the total catch of schooling species. A total of 308 Pacific herring were sampled from the commercial harvest.

It was not possible to obtain a Pacific herring spawning biomass estimate based on aerial surveys due to turbid water conditions during 1990. Evaluation of spawn deposition surveys, test fishing, and age composition data from test and commercial catches resulted in a Pacific herring biomass estimate of 4,500 st. Qualitative spawn deposition surveys indicated increased spawn deposition in 1990 compared to 1989, and there was a relatively strong showing of age 6 fish ir the 1990 biomass. Approximately 18% of the 1990 biomass was composed of age 6 herring. Age 7 and age 8 herring represented 11% and 14% of the biomass, respectively. Age 9 and older herring comprised 53% of the biomass. Recruits, age 3, 4, and 5 Pacific herring represented 4% of the biomass.

Daily spawn deposition surveys in the Kokechik Bay area of the Cape Romanzof District began on 15 May. On 19 May, the first observations were recorded. This initial spawn deposition was considered to be quite extensive and thick for a first spawn, and averaged 2 egg layers over the area where spawning occurred on Fucus substrate. After 19 May, the average egg layer dropped due to wave action, which caused considerable egg loss. Predictably, a gradual increase in spawn deposition followed, both in layers of eggs and distribution. Spawn deposition peaked on 29 May, with an average of 3.9 layers estimated on Fucus substrate. A steady decline of spawn deposition occurred subsequently; the last survey was conducted on 6 June.

Outlook 1991

Projected return for 1991, based upon limited information is 3,000 st. The Bering Sea Herring management strategy is to harvest 0-20% of the estimated herring biomass. Since the stock appears to be exhibiting a trend of decreasing abundance, the majority of fish being older age, a 15% exploitation rate will be used to manage the fishery in 1991. The harvest projection is 450 st. Average harvest for the period 1980-1989 was 1,054 st.

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 one 50 fathom gill net per vessel. A minimum level of biomass cannot be used to determine the opening 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. The initial commercial fishing period will be established when it is determined that commercial quantities of marketable sac roe herring are present on the grounds. Beach parties will be utilized to judge roe quality. Additional fishing periods may be established depending on total harvest to date and assessment of herring abundance through aerial surveys (if possible), cumulative spawn deposition, test and commercial catch rates, and age composition.

COMMERCIAL FRESHWATER FISHERIES

Regulations adopted by the Alaska Board of Fisheries allow the Department of Fish and Game to issue permits for the commercial harvest of freshwater 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 during 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 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 mesh) are used as capture gear, and fishing during fall months occurs under the ice (Appendix Table 43). Not all fish reported on permits for this area are sold.

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 44.

Numerous other permits allowing limited harvests of whitefish, primarily for the Upper Yukon Area, have been issued. In most cases, commercial harvests have not occurred.

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 45. Two permits were issued in 1990. There was a reported harvest of 180 whitefish (260 pounds). Set gill nets are primarily used for taking whitefish and sheefish in the Lower Yukon Area. Typically, the catch is marketed in local village stores or Bethel.

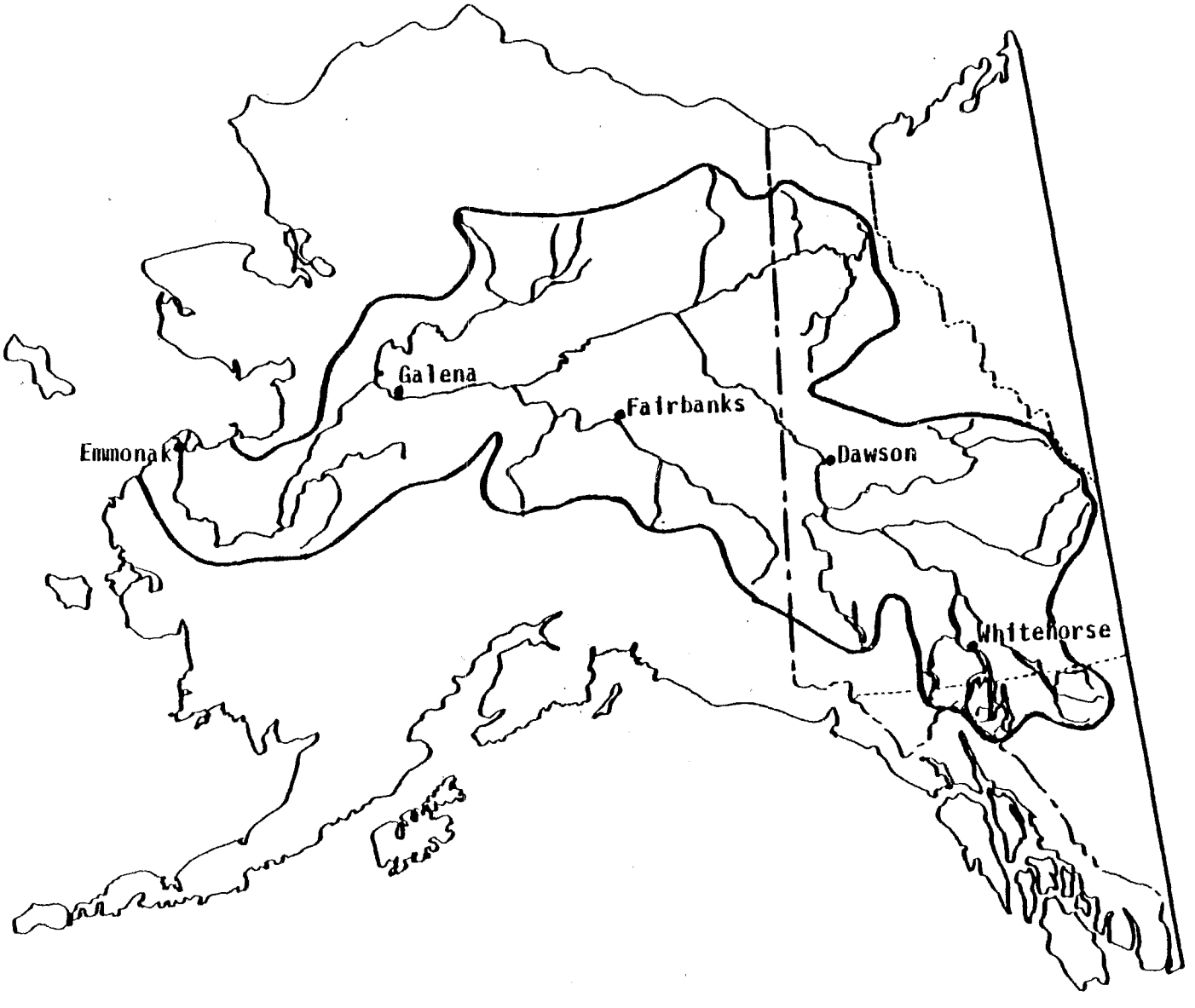


Figure 1. The Yukon River drainage, 330,000 square miles.

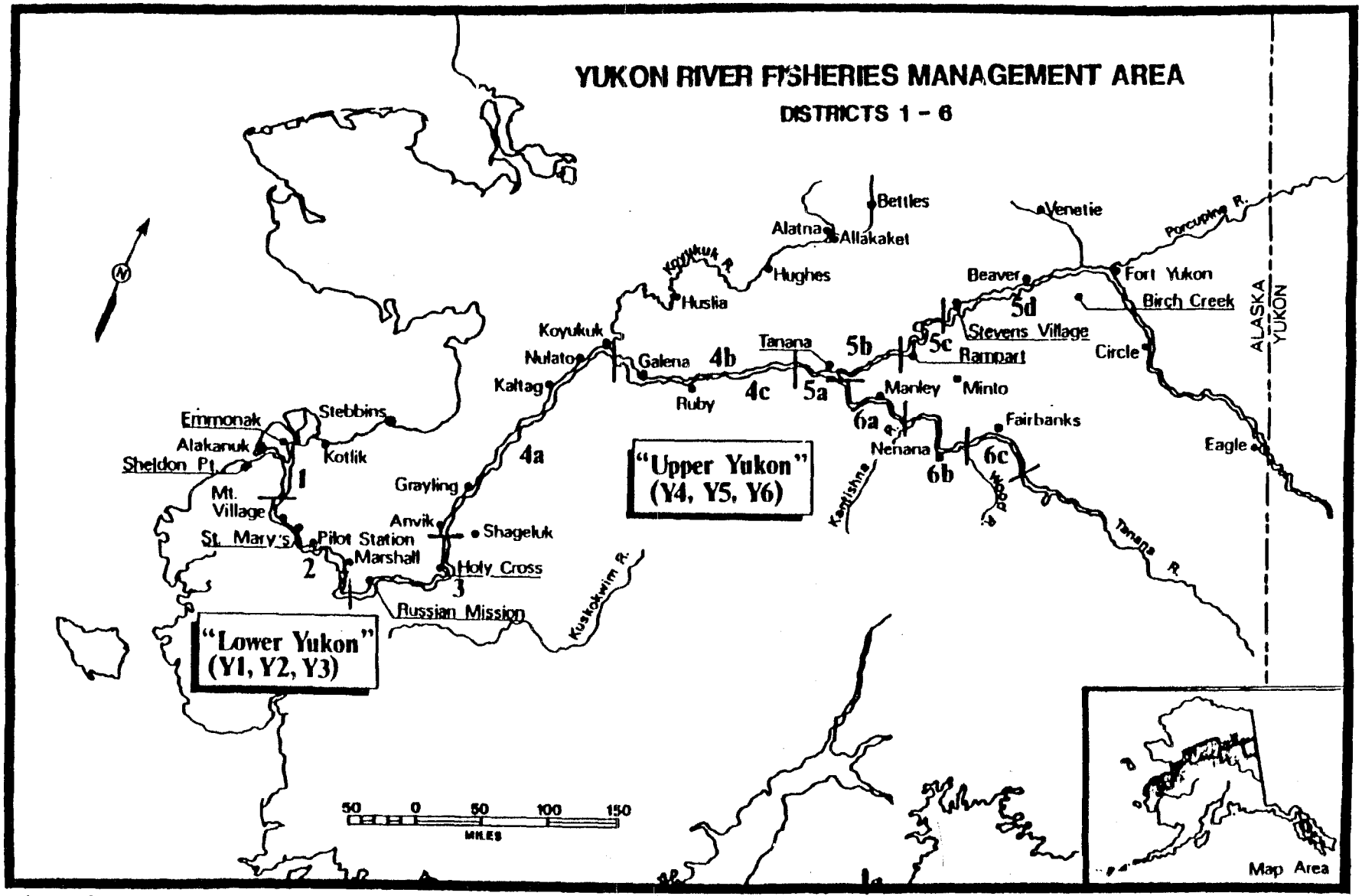


Figure 2. Districts 1-6 of Yukon management area.

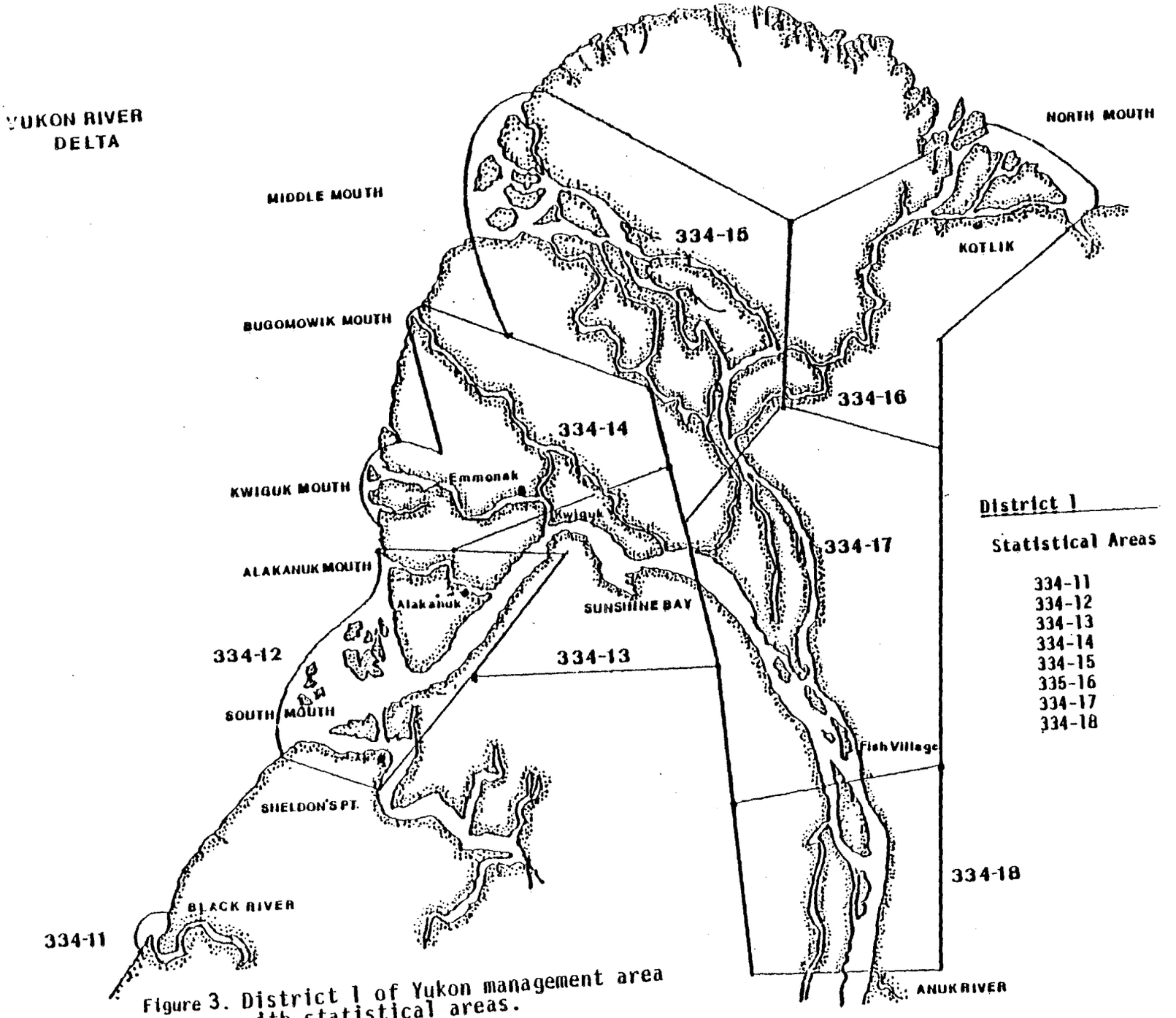
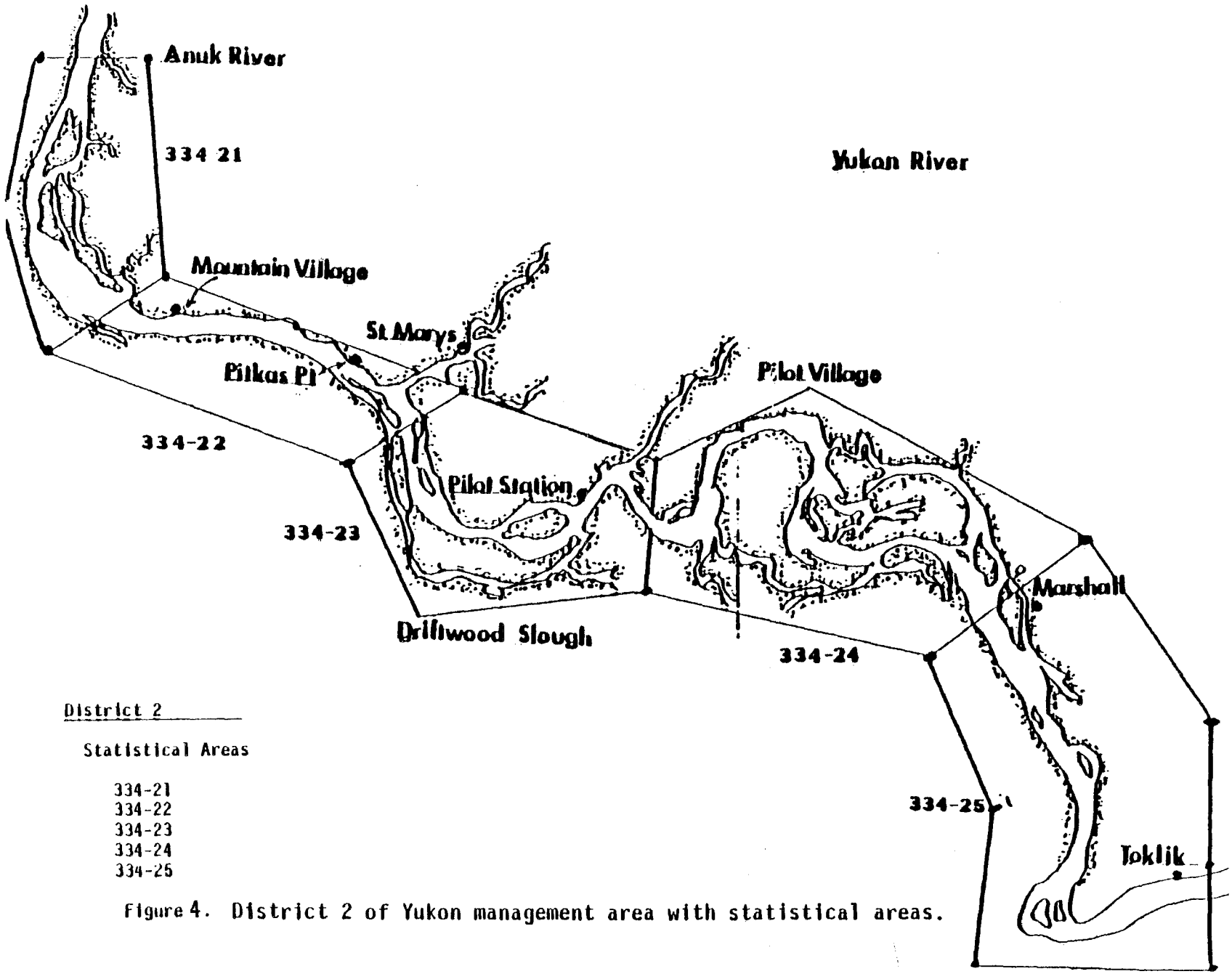


Figure 3. District 1 of Yukon management area with statistical areas.



District 2

Statistical Areas

334-21
334-22
334-23
334-24
334-25

Figure 4. District 2 of Yukon management area with statistical areas.

District 3

Statistical Areas

334-31
334-32

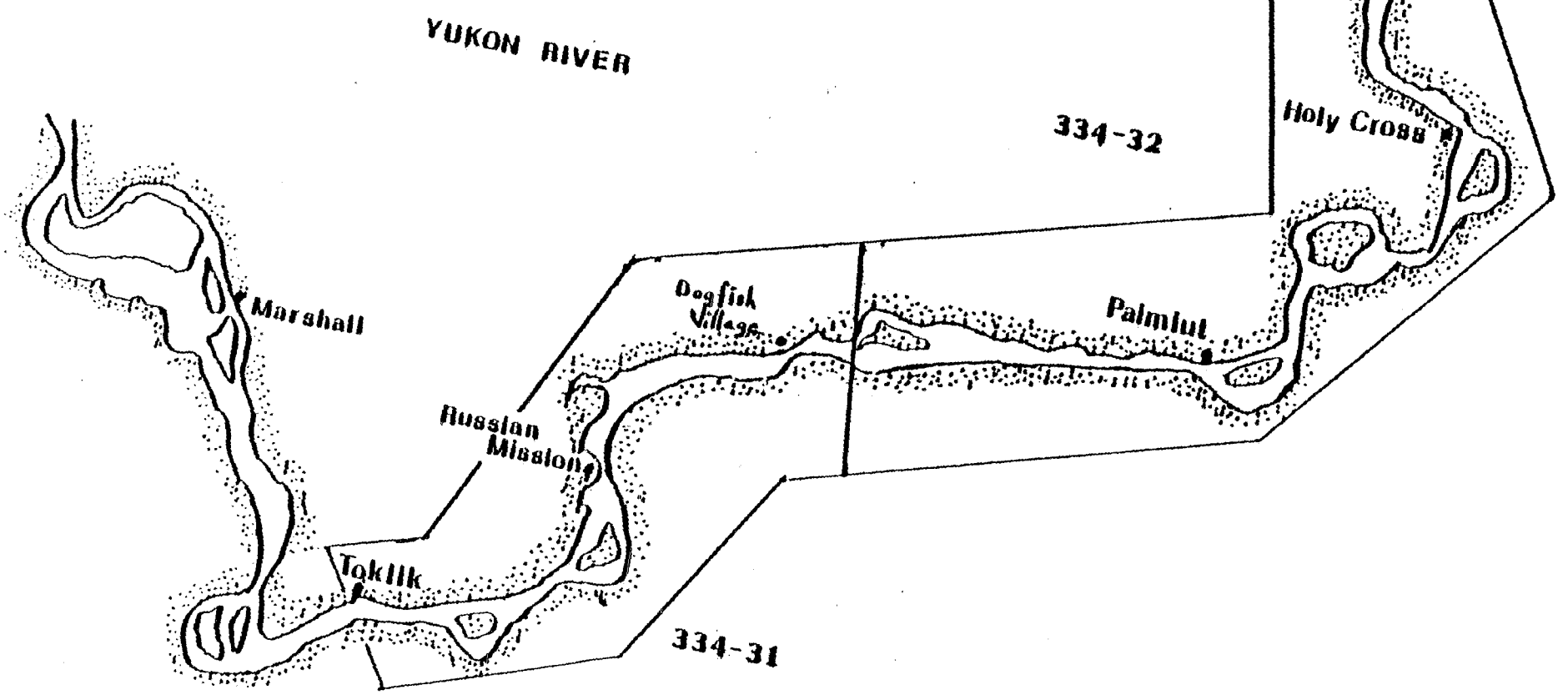


Figure 5. District 3 of Yukon management area with statistical areas.

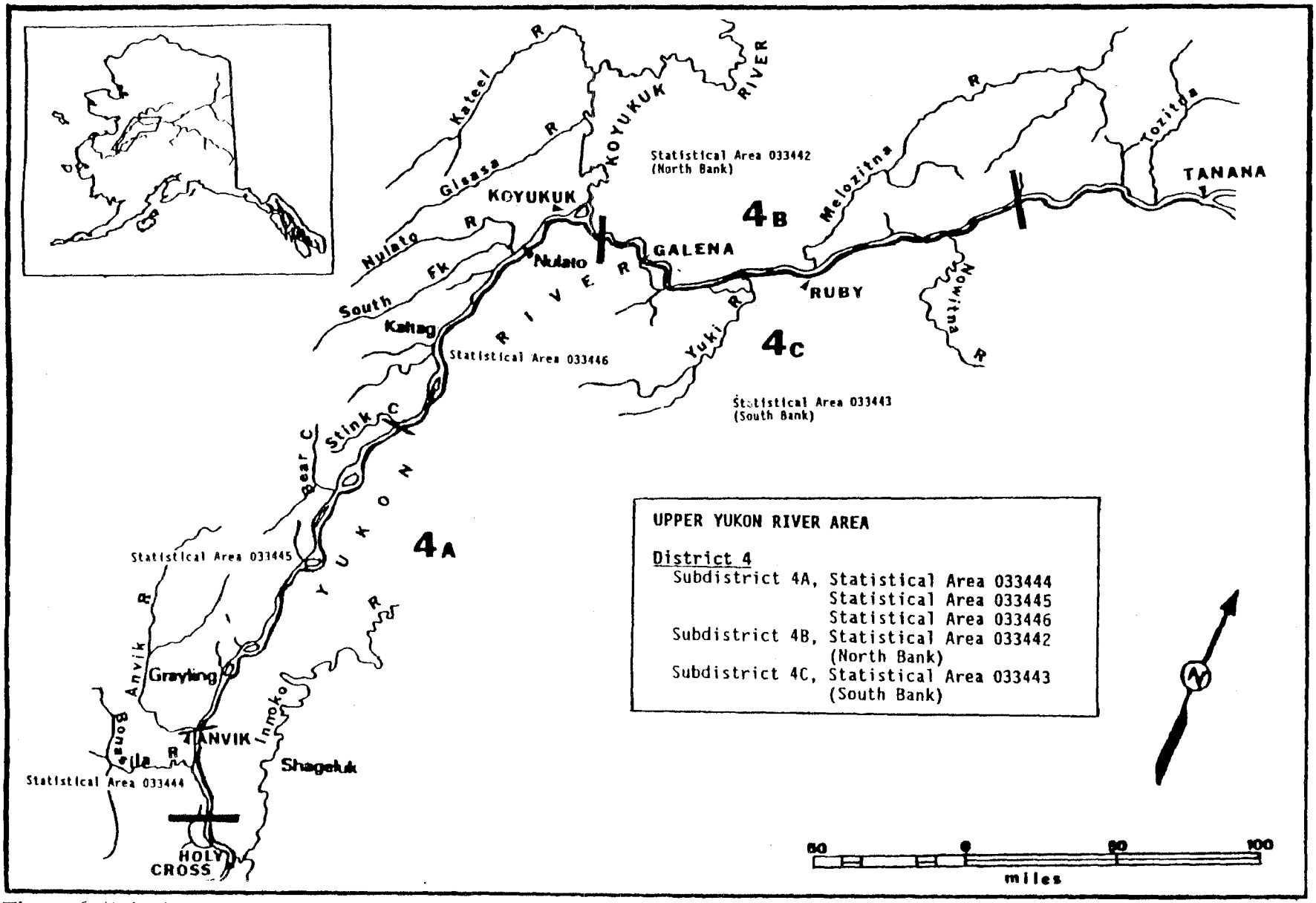


Figure 6. District 4 of Yukon management area with statistical areas.

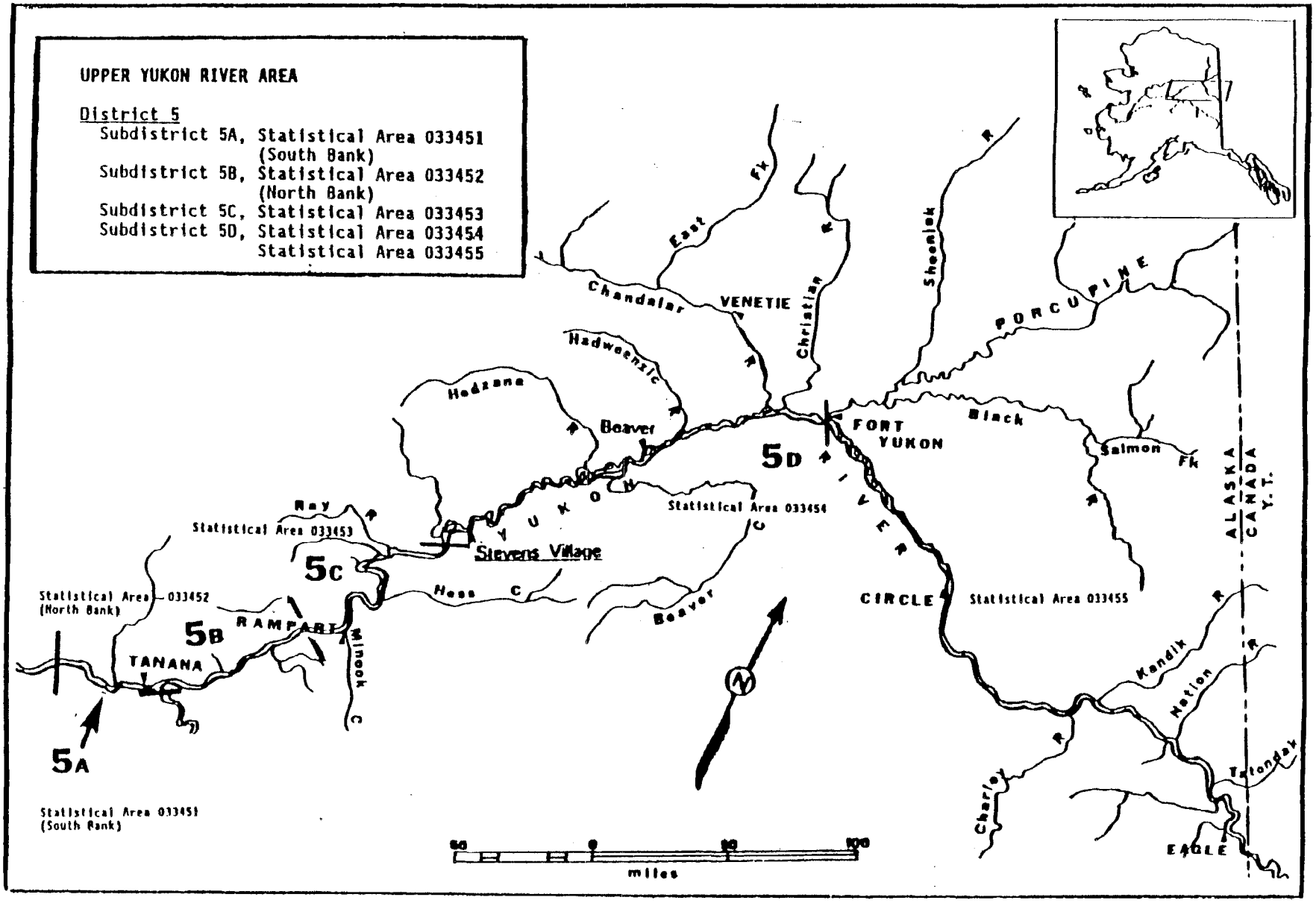


Figure 7. District 5 of Yukon management area with statistical areas.

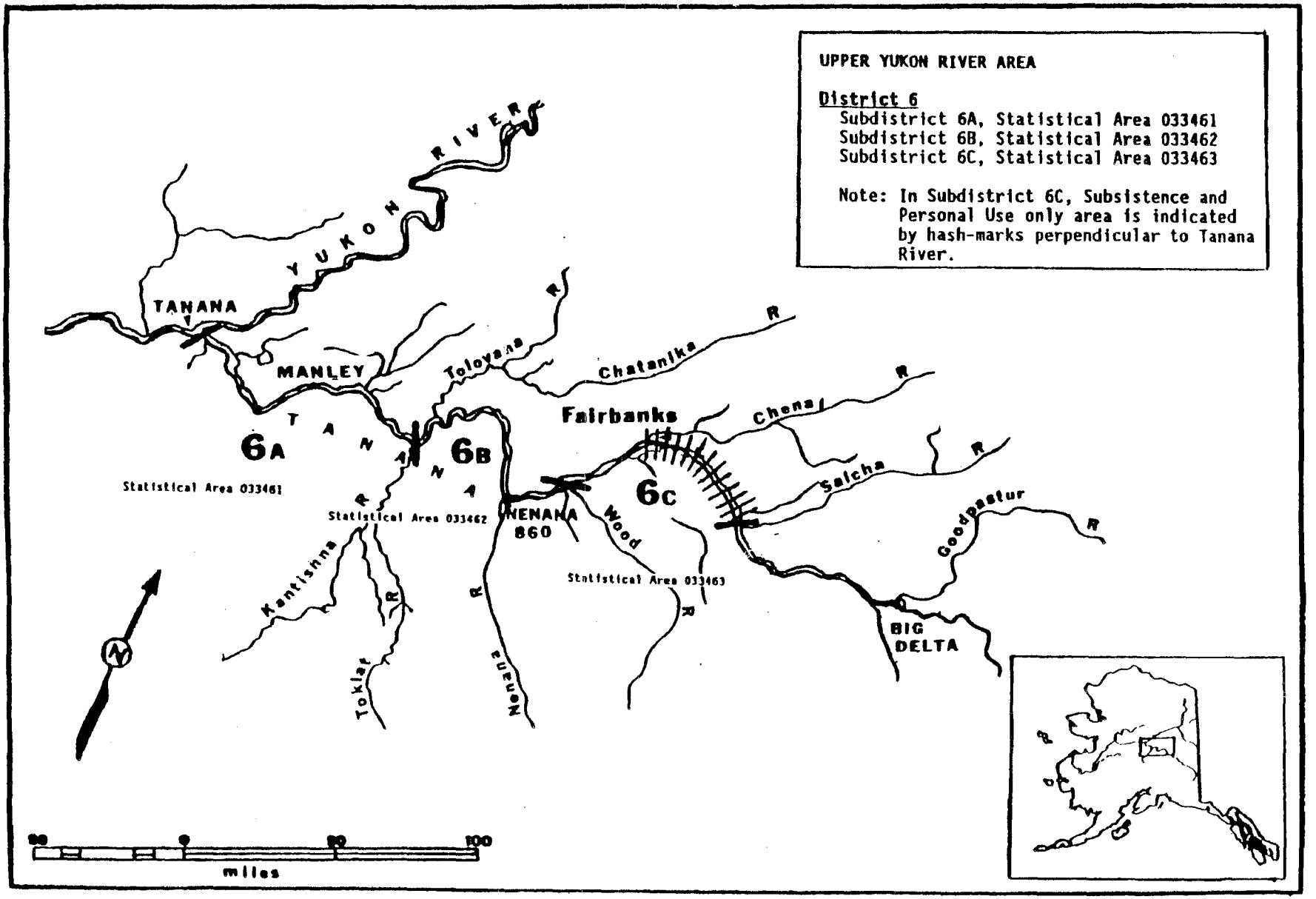


Figure 8. District 6 of Yukon management area with statistical areas.

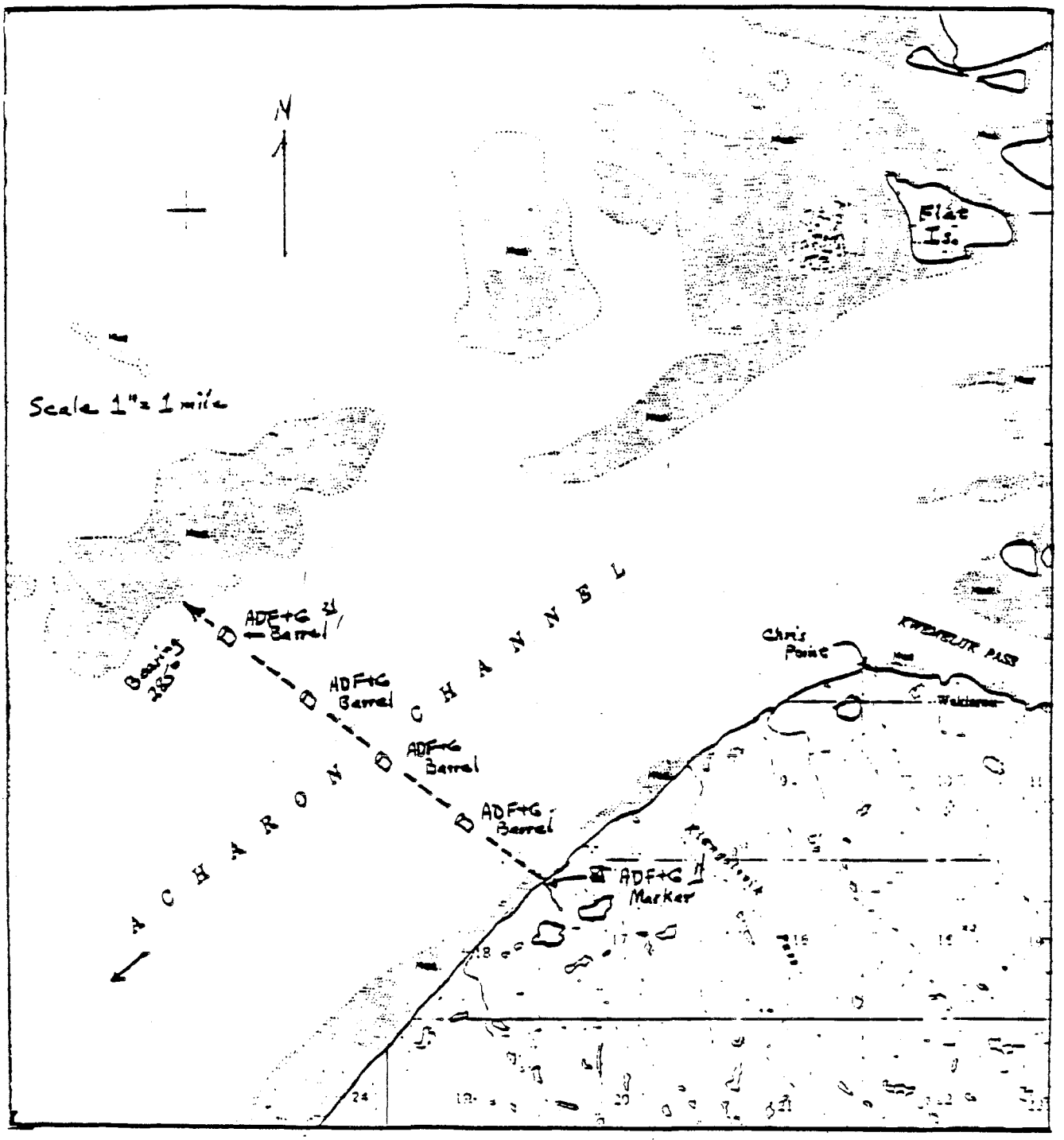


Figure 9. Closed waters Acharon Channel, south mouth Yukon River. (5AAC 05.350. CLOSED WATERS. (1) Acharon Channel of the south mouth area of the Yukon River west of a 2-1/2 nautical mile long line bearing 285° from an ADF&G regulatory marker located below Chris Point to the opposite side of the channel; 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.

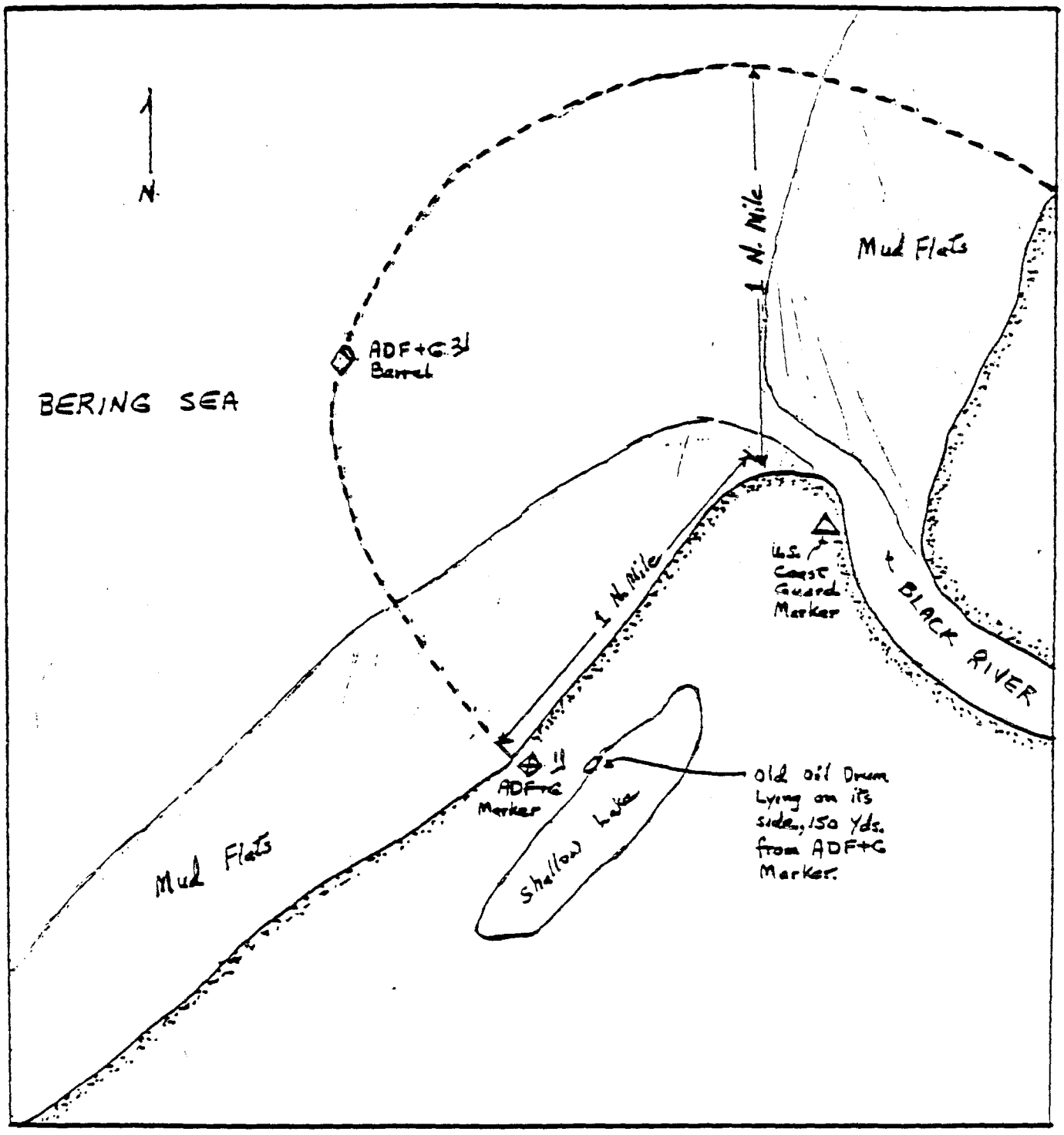


Figure 10. Closed waters of Black River mouth. (5AAC 05.350. CLOSED WATERS. (3) waters west of a one nautical mile radius from the mouth of Black River).

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.

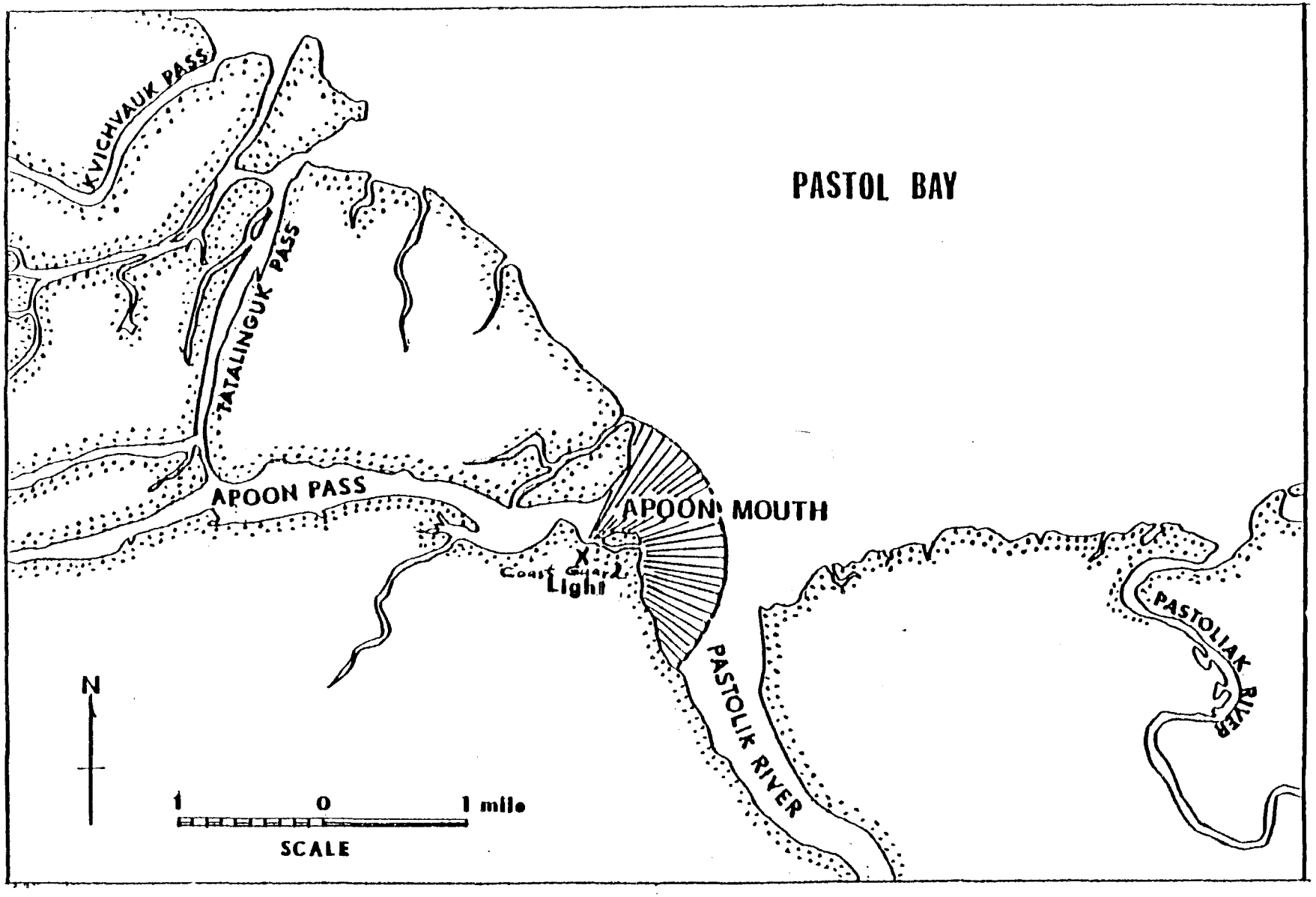


Figure 11. Closed waters of Apoon Mouth, Yukon River (5 AAC 05.350. CLOSED WATERS. (9) Waters east of a one nautical mile radius from a U.S. Coast Guard light at the mouth of Apoon Pass).

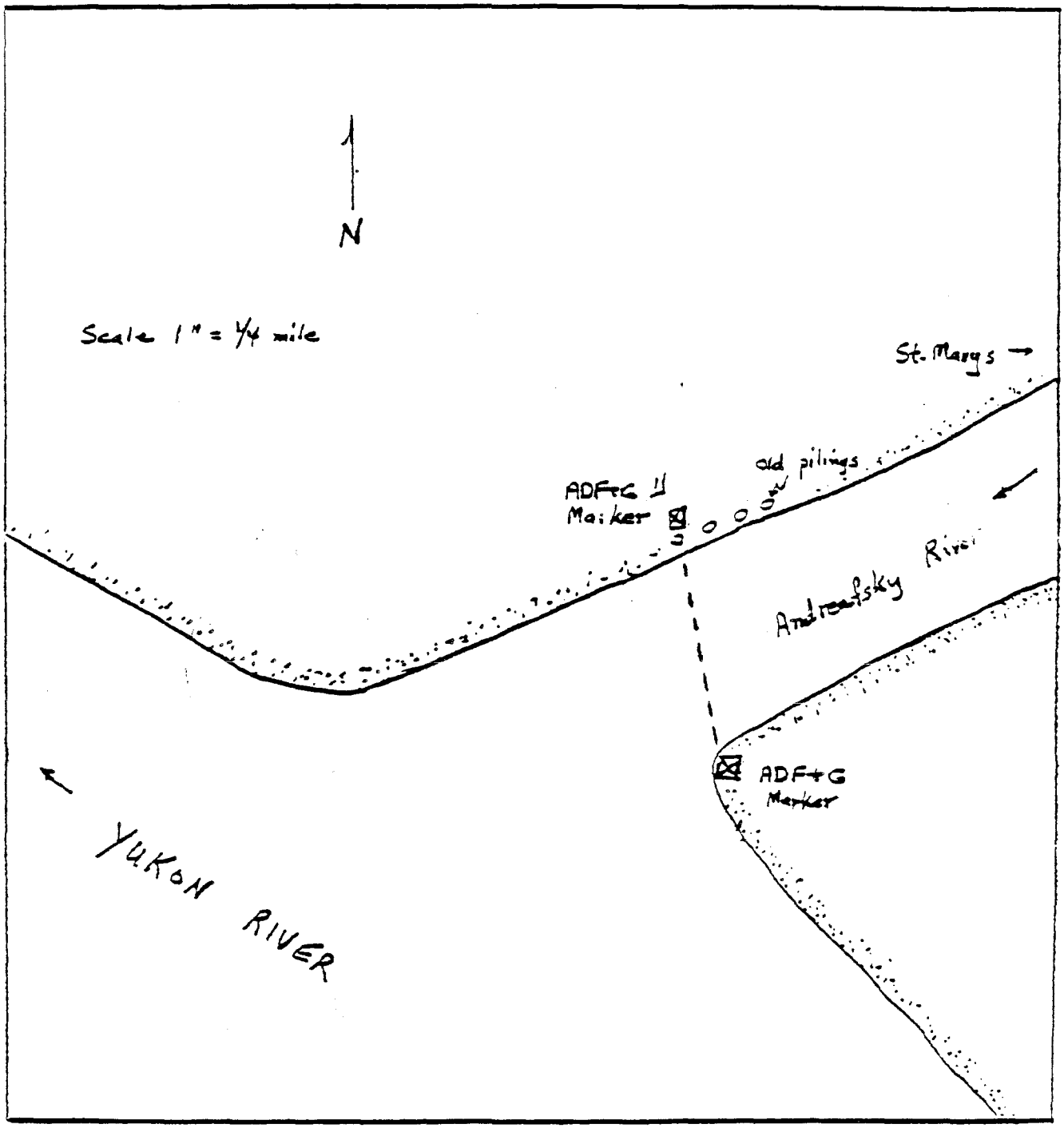


Figure 12. Closed waters of Andreafsky River mouth. (5AAC 05.350. CLOSED WATERS. (4) waters of the Andreafsky River upstream of a line from Department regulatory markers placed on each side of the river at its mouth).

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

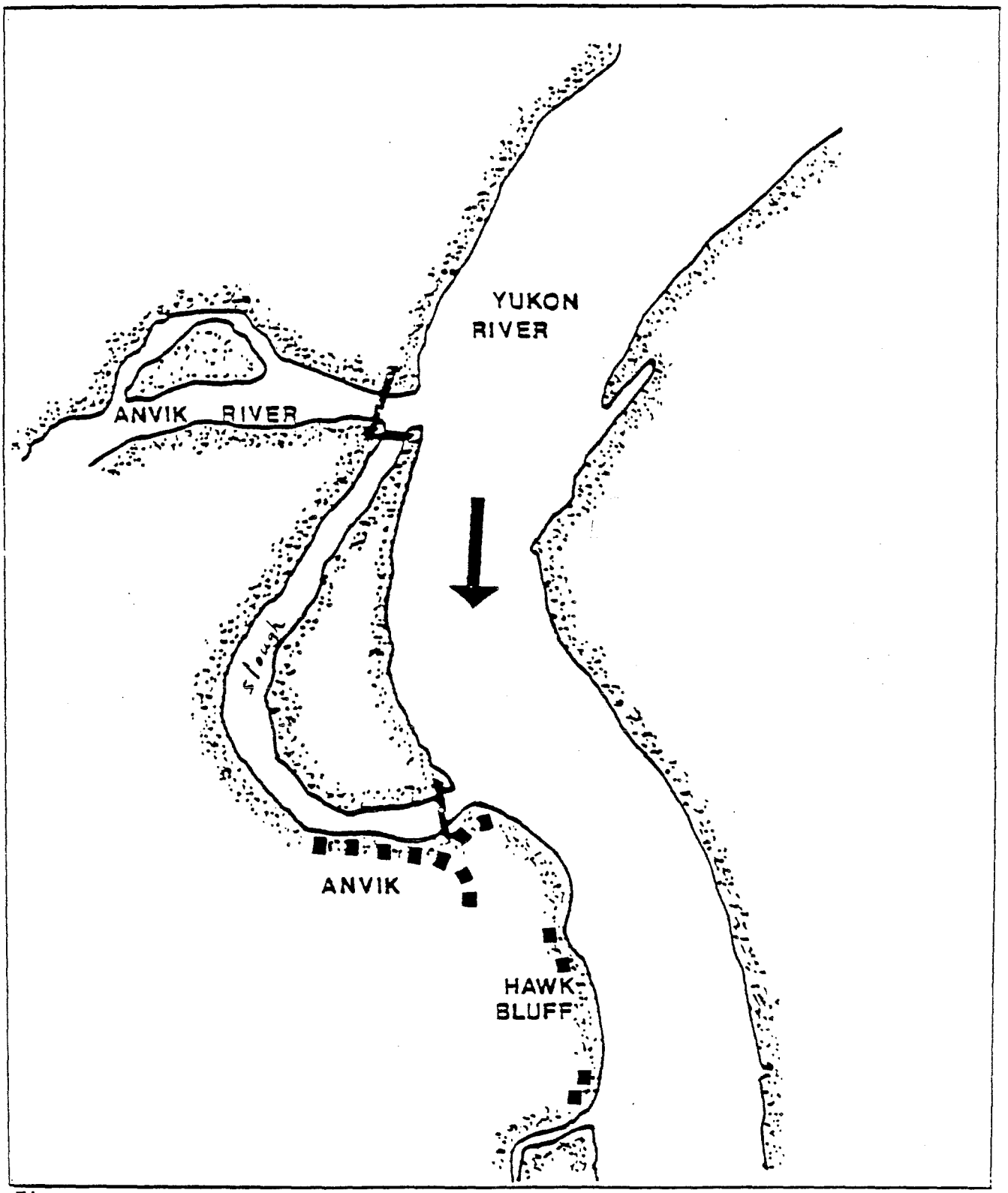


Figure 13. Closed waters of Anvik River mouth. (5AAC 05.350. (CLOSED WATERS (8) waters of the Anvik River upstream of a line between department regulatory markers placed on each side of the river at its mouth). Markers (6) placed north and south banks of the Anvik River mouth and at upstream and downstream mouths of slough (Old Anvik River Channel).

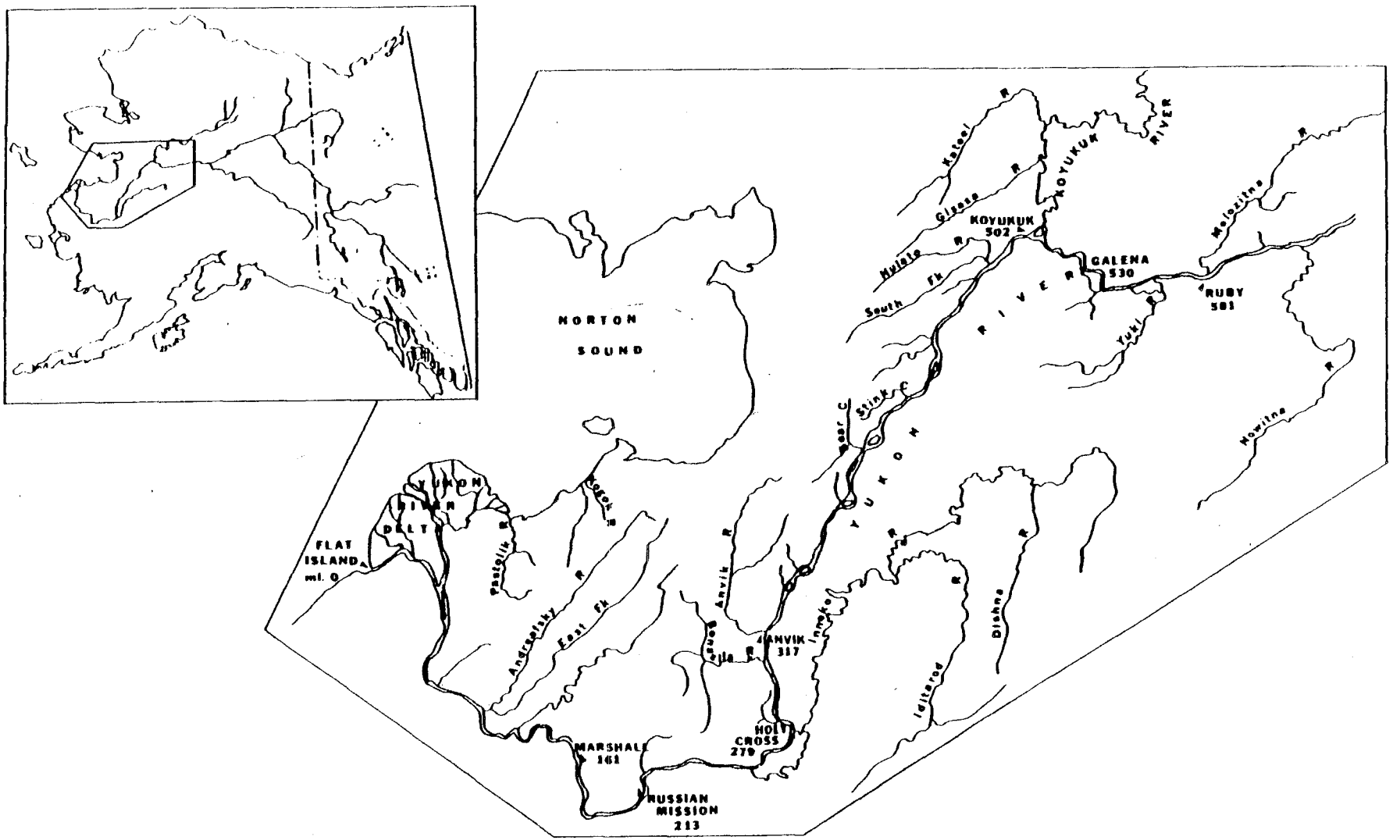


Figure 14. The lower Yukon River drainage.

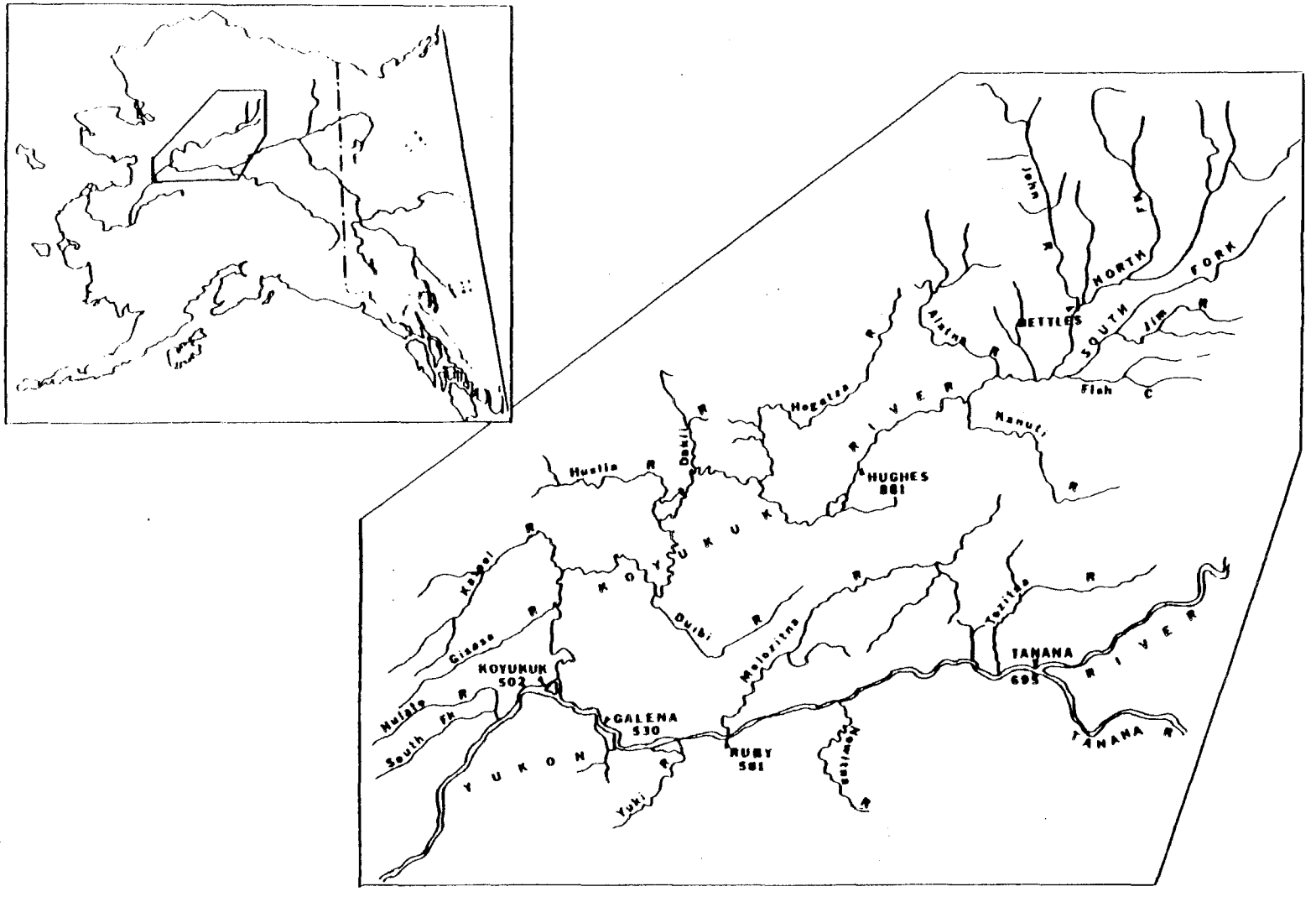


Figure 15. The Koyukuk River drainage.

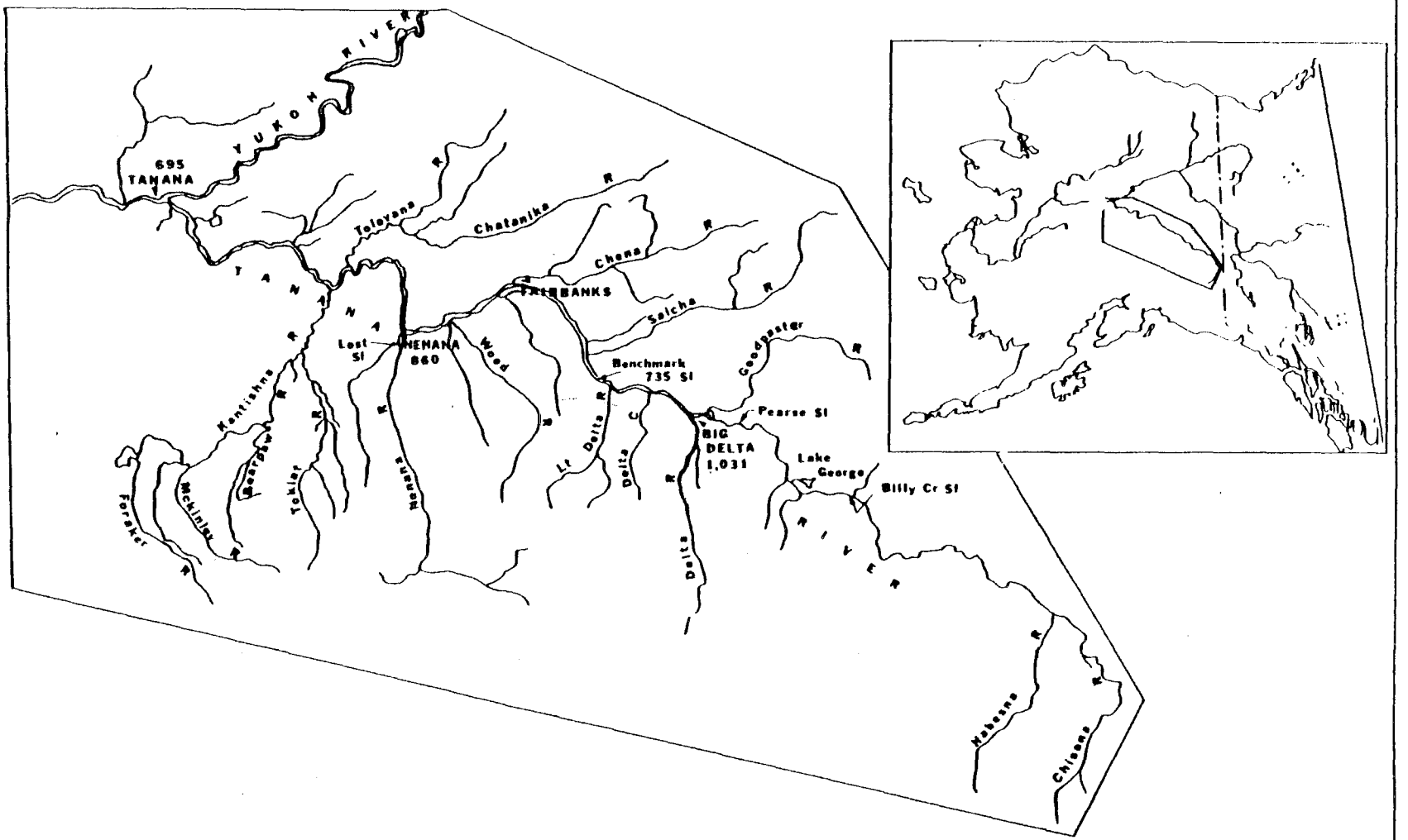


Figure 16. The Tanana River drainage.

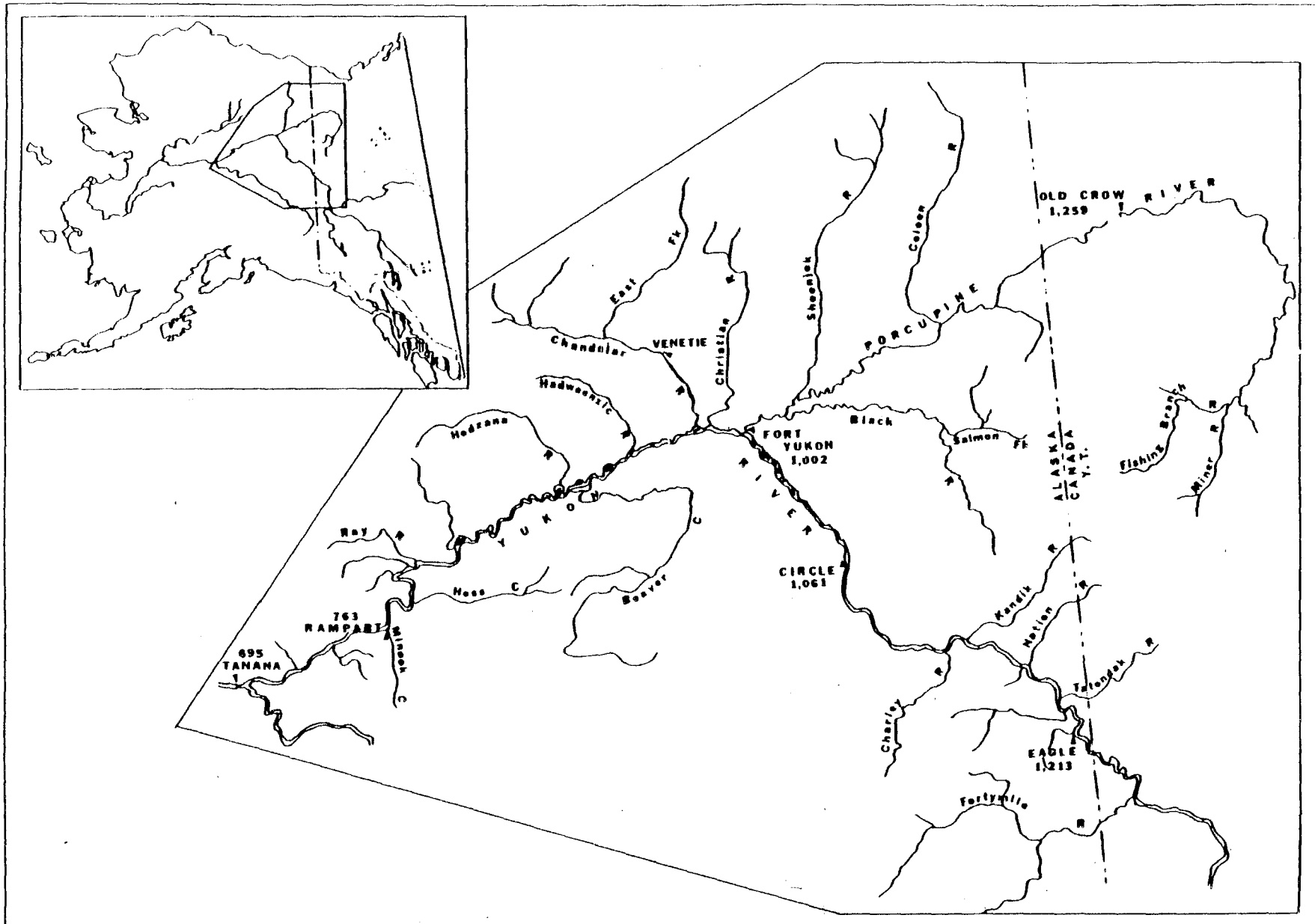


Figure 17. The middle Yukon River and Porcupine River drainage.

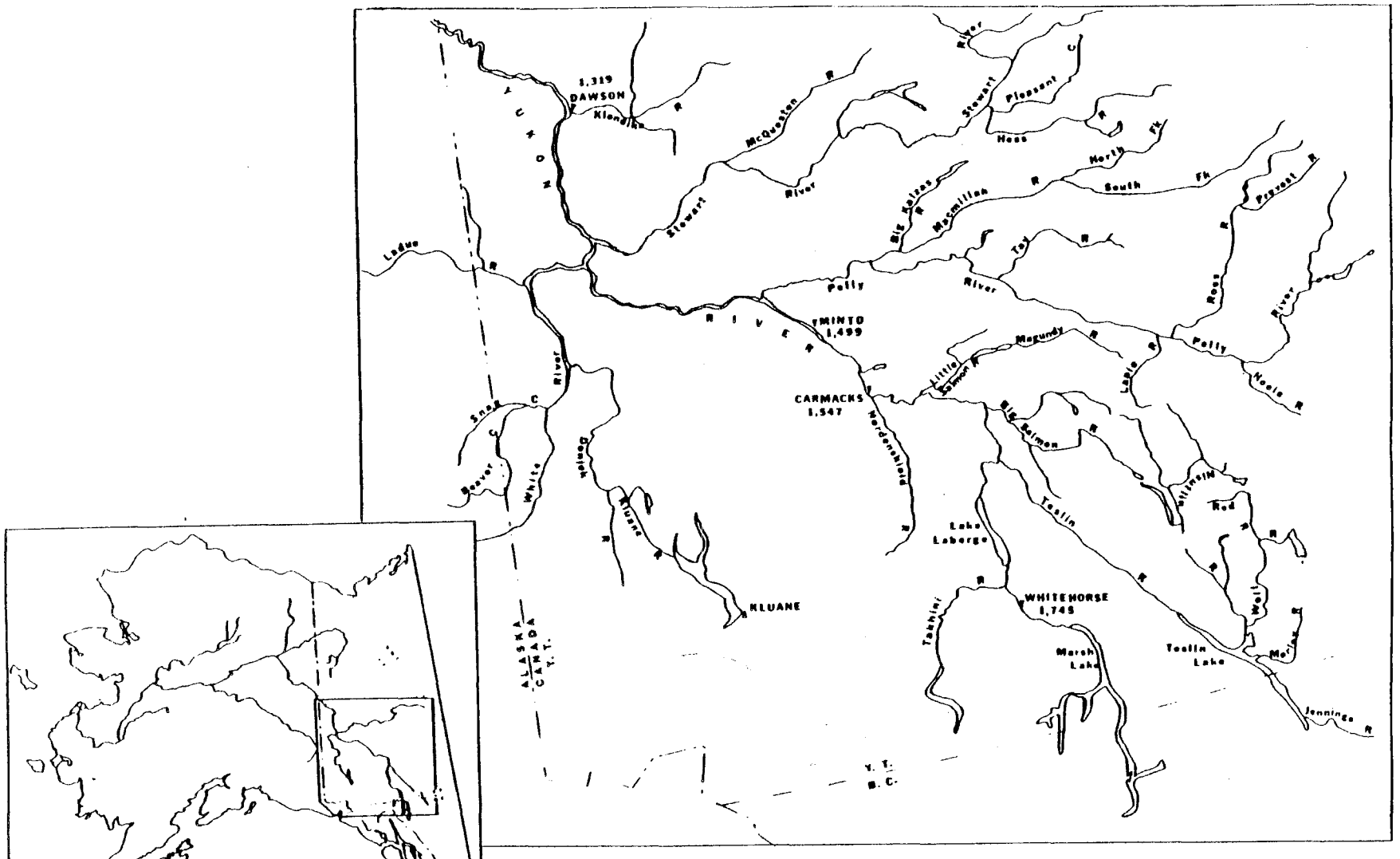


Figure 18. The upper Yukon River drainage.

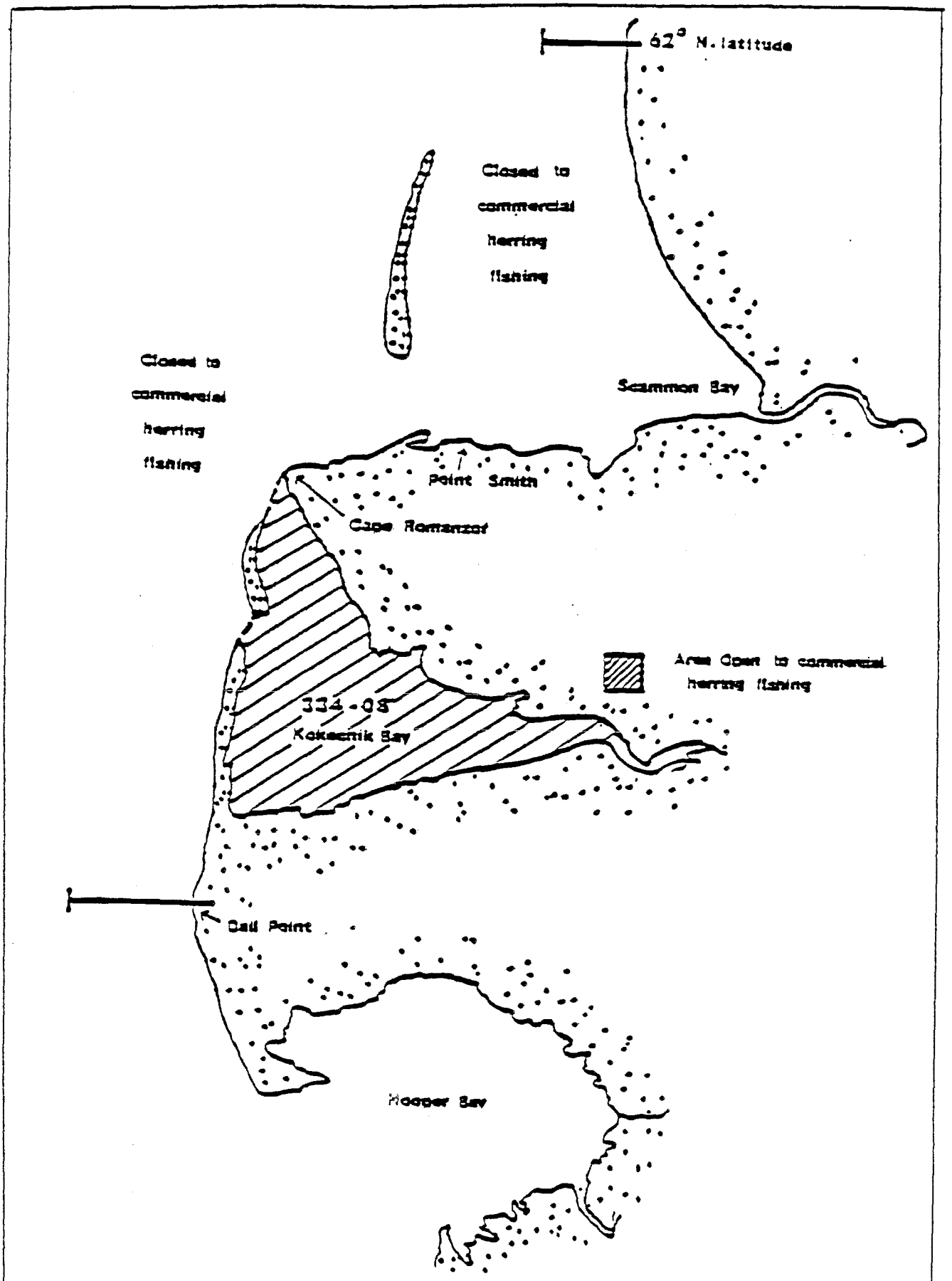


Figure 19. Cape Romanzof District.

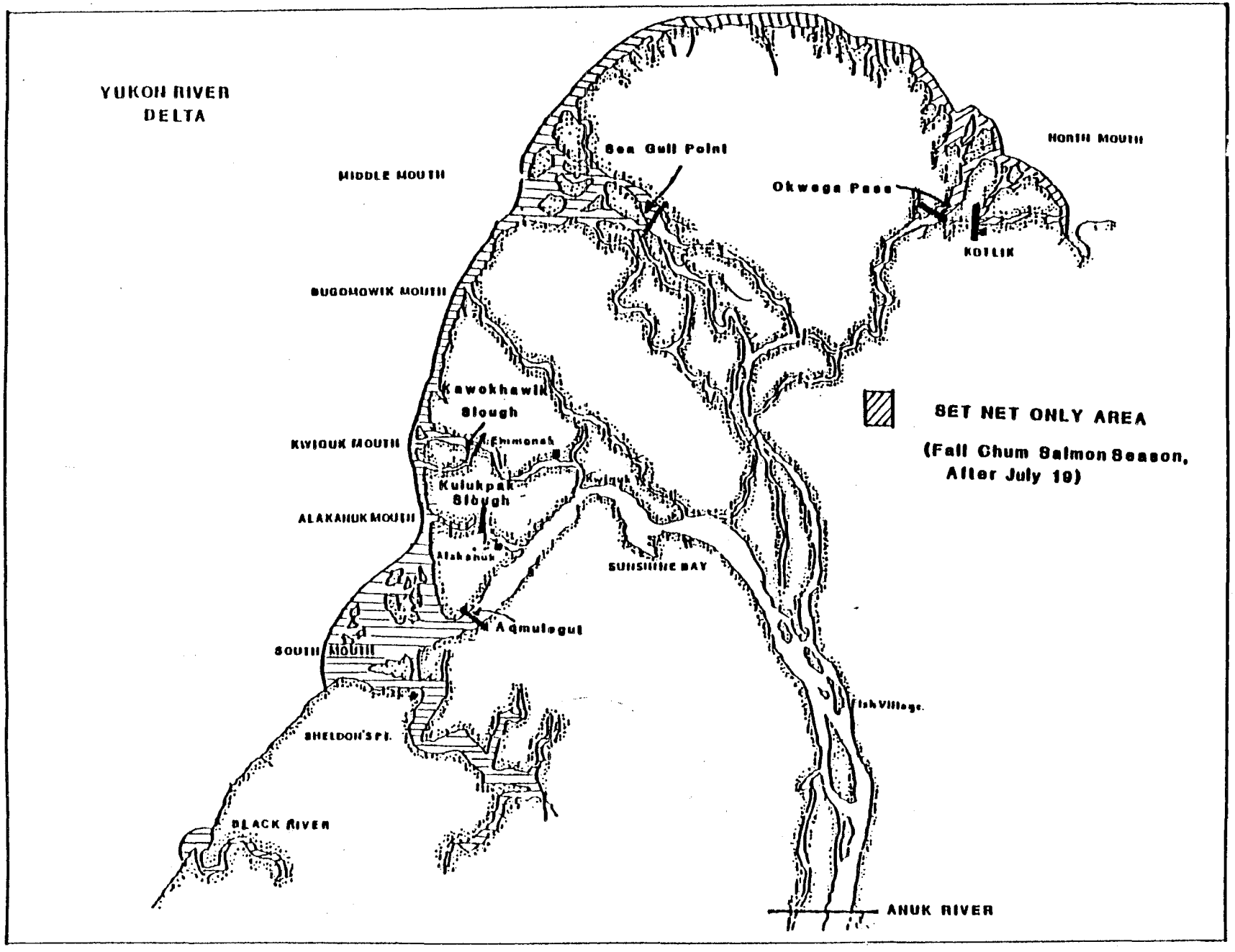


Figure 20. Set net only area, District 1 of the Yukon Management Area.

Table 1. Yukon River drainage mileages.

Location	Mileage 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	63
(District 1/2 Boundary)	
Patsys Cabin	71
Mountain Village	87
Old Andreafsky	97
Pitkas Point	103
Mouth, Andreafsky River	104
St. Marys	107
Pilot Station	122
Mouth, Atcheulinguk (Chulinak) River	126
Pilot Village	138
Marshall (Fortuna Ledge)	161
Upstream Mouth Owl Slough	163
Ingrihak	170
Ohogamuit	185
Toklik	191
(District 2/3 Boundary)	
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	301
(District 3/4 Boundary)	
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 R.)	956
Allakaket	956

Table 1. (continuation page 2 of 3)

Location	Mileage from Mouth
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	664
(District 4/5 Boundary)	
Mouth, Tozitna River	681
Tanana Village	695
Mouth, Tanana River	695
(District 5/6 Boundary)	
Manley Hot Springs	765
Mouth, Kantishna River	793
Mouth, Toklat River	838
Mouth, Sushana R.	850
Mouth, Bearpaw River	887
Outlet, L. Minchumina	959
Minto	835
Nenana	860
Mouth, Nenana River	860
Mouth, Wood River	894
Rosie Creek Bluffs	912
Mouth, Chena R. (Fairbanks)	920
Mouth, Salcha River	965
Benchmark #735 Slough	991
Mouth, Little Delta R.	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
Outlet, Clearwater Crk (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

Table 1. (continuation page 3 of 3)

Location	Mileage from Mouth
Mouth, Porcupine River	1,002
Mouth, Black River	1,026
Chalkyitsik	1,084
Mouth, Salmon Fork R.	1,142
Mouth, Sheenjek River	1,054
Mouth, Coleen River	1,157
Mouth, Salmon Trout R.	1,193
U.S. - Canadian Border	1,219
Old Crow	1,259
Fishing Branch R.	1,600
spawning area	
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	1,455
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 L.	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, N. Big Salmon R.	1,641
Mouth, S. Big Salmon R.	1,657
Outlet, Big Salmon Lake	1,714
Mouth, Teslin River	1,654
Roaring Bull Rapids	1,707
Johnson's Crossing	
(Outlet, Teslin L.)	1,756
Teslin	1,780
Mouth Nisutlin River	1,788
Mouth, Sidney Creek	1,837
Mouth, Hundred Mi. Creek	1,851
Mouth, NcNeil 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
Outlet, Marsh Lake	1,764
Mouth, M'Clintock River	1,769
Outlet, Little Atlin L.	1,788
Outlet, Atlin Lake	1,812
Atlin	1,844
Tagish	1,786
Outlet, Tagish Lake	1,788
Carcross	1,810
(Outlet L.Bennett)	
Bennett	1,835

Table 2. List of indigenous fishes found in the Yukon area.[a]

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	chinook salmon
420	Oncorhynchus nerka	sockeye salmon
430	Oncorhynchus kisutch	coho salmon
440	Oncorhynchus gorbuscha	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

a Includes fishes found in the Yukon River drainage in Canada.

Table 3. Yukon area processors and associated data, 1990.

Commercial operation (Processing location/ buying station)	Product	District
Icicle Seafoods, Inc. 4019 21st Ave. W. Seattle, WA 98199 (M/V Chichagof)	Sac Roe Herring (frozen)	Cape Romanzof
Lafayette Fisheries, Inc. 4259 22nd Ave. W. Seattle, WA 98199 (M/V Chatham, P/V Lafayette)	Sac Roe Herring (frozen)	Cape Romanzof
Pan Pacific Seafoods, Inc. 150 Nickerson St., Suite 103 Seattle, WA 98109 (P/V Pacific Producer, M/V North Point, M/V Pavlof, M/V Pacific Packer)	Sac Roe Herring (frozen)	Cape Romanzof
Woodbine Alaska Fish Co. P.O. Box 218 Naknek, AK 99633 (M/V Response)	Sac Roe Herring (frozen)	Cape Romanzof
Yukon Salmon Co. P.O. Box 343 Talkeetna, AK 99676	Hard Salt Chum Coho	1
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 Salt General Delivery Scammon Bay, AK 99662 (Black River)	Hard Salt Chinook Chum	1

-Continued-

Table 3. (p. 2 of 4)

Commercial operation (Processing location/ buying station)	Product	District
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 and Mt. Village)	Fresh Salmon Chinook Chum Coho Salmon Roe	1 and 2
Schenk Seafood Sales, Inc. P.O. Box 984 Bellingham, WA 98227 (Lamont Slough)	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 Salmon Roe	1 and 2
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	2
Pacific Caviar 117 Telegraph Rd. Suite 316 Bellingham, WA 98226 (Aniak, Anvik, Grayling)	Fresh Salmon Chinook Chum Salmon Roe	3 and 4

–Continued–

Table 3. (p. 3 of 4)

Commercial operation (Processing location/ buying station)	Product	District
Azuma Corporation Ltd. 520 W. 58th Ave. Anchorage, AK 99518 (Aniak P.O. Box 19)	Smoked Salmon Chinook Chum Coho Salmon Roe	4
Dainty Island Box 49 Galena, AK 99741 (Galena)	Smoked Salmon Chinook Chum Salmon Roe	4
Great Northern Seafoods 2604 Fairbanks St. Suite B Anchorage, AK 99503 (Galena)	Salmon Roe	4
Kallands Fisheries 405 Slater St. #8 Fairbanks, AK 99701	Fresh/Frozen Salmon Chinook Chum Coho	4
Whitney Foods P.O. Box 190429 Anchorage, AK 99503 (Nulato, Kaltag)	Frozen Salmon Chinook Chum Coho Salmon Roe	4
Towa Americana, Inc. 424 East Manor Ave. Anchorage, AK 99501 (Galena, Anvik) Towa Americana–Madros (Nulato, Koyukuk)	Frozen Salmon Chinook Chum Coho Salmon Roe	4
Interior Alaska Fish Processing 878 Lynnwood Way North Pole, AK 99705 (North Pole)	Fresh/Frozen Salmon Smoked Salmon Chinook Chum Coho Salmon Roe Custom Processing	4, 5, and 6

–Continued–

Table 3. (p. 4 of 4)

Commercial operation (Processing location/ buying station)	Product	District
Yutana Fisheries P.O. Box 82556 College, AK 99708 (Manley)	Frozen Salmon Chinook Chum Coho Salmon Roe	5 and 6
Circle Fish Co. P.O. Box 14 Circle, AK 99733 (Circle)	Frozen Salmon Chinook Chum Salmon Roe	5
Denny Mac Enterprizes, Inc. P.O. Box 289 Nenana, AK 99760 (Nenana)	Frozen Salmon Chum Coho Salmon Roe	6
Ludecker 2875 Ludecker Rd. Fairbanks, AK 99701	Fresh/Frozen Salmon Chinook Chum Coho Salmon Roe	6
Stevens Fisheries P.O. Box 38 Nenana, AK 99760 (Nenana)	Frozen Salmon Chum Coho Salmon Roe	6

Table 4. Yukon Area commercial salmonand salmon roe sales by statistical area, 1990. a

Statistical Area	Summer Season				Fall Season					Total						
	Chinook	Chinook Roe	Chum	Chum Roe	Chinook	Chum	Chum Roe	Coho	Coho Roe	Chinook	Chinook Roe	Chum	Chum Roe	Coho	Coho Roe	Pink b
334-11	1,472	0	23,453	0	1	255	0	4	0	1,473	0	23,708	0	4	0	56
12	7,298	0	35,542	0	17	3,690	0	736	0	7,315	0	39,232	0	736	0	90
13	4,477	0	15,326	0	1	501	0	301	0	4,478	0	15,827	0	301	0	3
14	4,254	0	12,369	0	3	1,167	0	1,684	0	4,257	0	13,536	0	1,684	0	9
15	12,465	0	10,931	0	21	7,927	0	2,108	0	12,486	0	18,858	0	2,108	0	39
16	2,759	0	1,513	0	35	5,618	0	2,530	0	2,794	0	7,131	0	2,530	0	100
17	14,606	0	39,575	0	13	4,695	0	2,429	0	14,619	0	44,270	0	2,429	0	34
18	3,737	0	10,202	0	2	3,484	0	3,562	0	3,739	0	13,686	0	3,562	0	87
Subtotal District 1	51,068		148,911	0	93	27,337	0	13,354	0	51,161		176,248	0	13,354	0	418
334-21	5,582	0	15,414	0	10	6,311	0	1,226	0	5,592	0	21,725	0	1,226	0	207
22	10,667	0	37,585	0	8	8,298	0	11,364	0	10,675	0	45,883	0	11,364	0	108
23	3,726	0	25,132	0	15	5,403	0	962	0	3,741	0	30,535	0	962	0	0
24	8,506	0	34,980	0	8	10,147	0	2,032	0	8,514	0	45,127	0	2,032	0	9
25	4,690	0	19,396	0	1	7,014	0	851	0	4,691	0	26,410	0	851	0	0
Subtotal District 2	33,171		132,507	0	42	37,173	0	16,435	0	33,213		169,680	0	16,435	0	324
334-31	2,128	0	562	0	0	1,863	0	752	0	2,128	0	2,425	0	752	0	0
32	211	0	81	0	2	1,852	0	166	0	213	0	1,933	0	166	0	1
Subtotal District 3	2,339	0	643	0	2	3,715	0	918	0	2,341	0	4,358	0	918	0	1
TOTAL LOWER YUKON	86,578	0	282,061	0	137	68,225	0	30,707	0	86,715	0	350,286	0	30,707	0	743

-Continued-

Table 4. (p. 2 of 2)

Statistical Area	Summer Season				Fall Season					Total						
	Chinook	Chinook Roe	Chum	Chum Roe	Chinook	Chum	Chum Roe	Coho	Coho Roe	Chinook	Chinook Roe	Chum	Chum Roe	Coho	Coho Roe	Pink c
334–42	784	0	1,091	6,600	0	3,406	1,680	0	0	784	0	4,497	8,280	0	0	0
43	2,700	0	96	3,582	0	1,583	671	0	0	2,700	0	1,679	4,253	0	0	0
44	0	8	0	27,628	0	0	0	0	0	0	0	0	27,628	0	0	0
45	0	0	427	28,181	0	0	0	0	0	0	0	427	28,181	0	0	0
46	52	0	10,750	39,732	0	0	0	0	0	52	8	10,750	39,732	0	0	0
Subtotal District 4	3,536	8	12,364	105,723	0	4,989	2,351	0	0	3,536	8	17,353	108,074	0	0	0
334–51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	1,630	47	0	225	0	5,169	945	0	0	1,630	0	5,169	1,170	0	0	0
53	1,180	0	5	350	0	0	0	0	0	1,180	47	5	350	0	0	0
54	194	0	6	19	0	1,758	113	0	0	194	0	1,764	132	0	0	0
55	349	0	0	0	0	851	0	0	0	349	0	851	0	0	0	0
Subtotal District 5	3,353	47	11	594	0	7,778	1,058	0	0	3,353	47	7,789	1,652	0	0	0
334–61	326	0	2,862	12	0	9,254	0	3,173	0	326	0	12,116	12	3,173	0	0
62	1,243	1,354	6,028	1,637	0	28,932	6,617	7,096	3,559	1,243	1,354	34,960	8,254	7,096	3,559	0
63	188	322	3,470 c	1,410	0	5,880 d	918	1,718 e	483	188	322	9,350	2,328	1,718	483	0
Subtotal District 6	1,757	1,676	12,360	3,059	0	44,066	7,535	11,987	4,042	1,757	1,676	56,426	10,594	11,987	4,042	0
TOTAL UPPER YUKON	8,646	1,731	24,735	109,376	0	56,833	10,944	11,987	4,042	8,646	1,731	81,568	120,320	11,987	4,042	0
GRAND TOTAL YUKON AREA	95,224	1,731	306,796	109,376	137	125,058	10,944	42,694	4,042	95,361	1,731	431,854	120,320	42,694	4,042	743

a Sales reported in numbers of fish sold in the round and pounds of unprocessed roe (District 6 sales include female salmon sold with roe extracted and sold separately). Does not include sales of Department test fishing catches.
b Pink salmon catches occurred between July 2 and August 21.
c Includes 1,278 female summer chum salmon sold with roe extracted and sold separately.
d Includes 884 female fall chum salmon sold with roe extracted and sold separately.
e Includes 438 female coho salmon sold with roe extracted and sold separately.

Table 5. Yukon Area Commercial Fisheries Entry Commission salmon gear permits issued by residence, 1990. a,b

District	Residence	Gill Net Permits	Fish Wheel Permits
1, 2, and 3	Emmonak	94	
	Mountain Village	92	
	Alakanuk	81	
	Kotlik	74	
	St. Marys	70	
	Pilot Station	46	
	Marshall	47	
	Scammon Bay	39	
	Anchorage	25	
	Sheldon Point	23	
	Russian Mission	16	
	Bethel	16	
	Holy Cross	11	
	Stebbins	10	
	Fairbanks	9	
	Unalakleet	8	
	Wasilla	8	
	Shaktoolik	3	
	Chevak	2	
	Pitkas Point	2	
	Aniak	1	
	Big Lake	1	
	Cooper Landing	1	
	Eagle River	1	
	Eek	1	
	Elim	1	
	Fort Yukon	1	
	Homer	1	
	Hoonah	1	
	Hooper Bay	1	
	Iliamna	1	
	Kasigluk	1	
	Kenai	1	
	Kodiak	1	
	Koliganek	1	
	Manley Hot Springs	1	
	Napaskiak	1	
	Nome	4	
	Palmer	1	
	Port Alexander	1	
	Port Heiden	1	
	Red Devil	1	
	Salcha	1	
	Salem,	1	
	Sand Point	1	
	Seward	1	
	Sitka	1	
	St. Michael	1	
	Takotna	1	
	Talkeetna	1	
	Cameron Mills, NY	1	
	Contoocook, NH	1	
	Edmunds, WA	1	
	Everett, WA	2	
	Rock Hill, SC	1	
	Shelton,	1	
	Stanwood,	1	
	Troy, MT	1	
Total Lower Yukon		718 a,b	

(Continued)

Table 5. (p. 2 of 2).

District	Residence	Set Gill Net Permits	Fish Wheel Permits	Total Permits
4,5, and 6	Fairbanks	24	23	47
	Galena	5	24	29
	Nenana	8	20	28
	Nulato	1	19	20
	Tanana	3	15	18
	Kaltag	4	12	16
	Ruby	3	9	12
	Anvik	2	7	9
	Grayling	3	6	9
	Manley Hot Springs	2	5	7
	Anchorage	5	0	5
	Rampart	3	2	5
	Stevens Village	1	3	4
	Koyukuk	0	3	3
	Cantwell	1	1	2
	Circle City	1	1	2
	North Pole	1	1	2
	Wasilla	0	2	2
	Anchor Pt.	0	1	1
	Aniak	1	0	1
	Barrow	0	1	1
	College	0	1	1
	Ft. Yukon	0	1	1
	Holy Cross	1	0	1
	Huslia	0	1	1
	Kodiak	1	0	1
	Palmer	1	0	1
	Salcha	0	1	1
	Soldotna	1	0	1
	Willow	1	0	1
	Bemidji, MN	1	0	1
	Los Angeles, CA	1	0	1
Total Upper Yukon		75	159	234
Grand Total Yukon Area		793	159	952

a Counts are for initial issues only and do not include transfers.
b Counts include interim use permits.

Table 6. Commercial salmon catch and effort data by fishing period, set and drift gill nets combined, District 1, Yukon Area, 1990. a

Period No.	Period Dates	Hours Fished	No. of Fisher-men	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	6/14–6/15	9	417	18,920	5.04	0	0.00	25,319	6.75	18,920	5.04	0	0.00	25,319	6.75
3	6/21–6/22	12	407	15,020	3.08	0	0.00	23,285	4.77	33,940	3.93	0	0.00	48,604	5.63
4	6/28–6/29	9	406	6,487	1.78	0	0.00	12,363	3.38	40,427	3.29	0	0.00	60,967	4.96
5	7/02–7/03	12	338	1,665	0.41	0	0.00	5,243	1.29	42,092	2.57	0	0.00	66,210	4.05
Unrestricted Mesh Size Subtotal		42	452	42,092	2.57	0	0.00	66,210	4.05						
2	6/18–6/19	12	410	8,976	1.82	0	0.00	82,701	16.81	8,976	1.82	0	0.00	148,911	7.00
Restricted Mesh Size Subtotal b		12	410	8,976	1.82	0	0.00	82,701	16.81	8,976	1.82	0	0.00	148,911	7.00
Summer Season Total		54	453	51,068	1.82	0	0.00	148,911	7.00						
6	7/23–7/24	12/6	97	15	0.02	5	0.01	1,030	1.30	8,991	1.57	5	0.01	1,030	1.30
7	7/26–7/27	12/6	131	37	0.03	17	0.02	1,805	1.66	9,028	1.33	22	0.01	2,835	1.51
8	7/30–7/31	12/6	131	9	0.01	27	0.03	1,666	1.64	9,037	1.16	49	0.02	4,501	1.56
9	8/02–8/03	12/6	181	18	0.01	99	0.07	11,212	7.75	9,055	0.98	148	0.03	15,713	3.62
10	8/06–8/07	12/6	192	10	0.01	285	0.19	7,516	4.93	9,065	0.84	433	0.07	23,229	.96
11	8/20	12/6	206	4	0.00	12,921	8.45	4,108	2.68	9,069	0.74	13,354	1.81	27,337	3.70
Fall Season Total c		72/36	301	93	0.74	13,354	1.81	27,337	3.70						
Grand Total		126/90	459	51,161		13,354		176,248							

a Catches reported in numbers of fish sold in the round.
b Six inch maximum mesh size restriction in effect.
c During the fall chum salmon season, the district was divided into a Set Net Only (12 hour) area and a Gill Net (6 hour) area.

Table 7. Commercial salmon catch and effort data by fishing period, set and drift gill nets combined, District 2, Yukon Area, 1990. a

Period No.	Period Dates	Hours Fished	No. of Fisher-men	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	6/18	9	233	10,276	4.90	0	0.00	9,978	4.76	10,276	4.90	0	0.00	9,978	4.76
3	6/24	6	219	7,685	5.85	0	0.00	7,115	5.41	17,961	5.27	0	0.00	17,093	5.01
5	7/01-7/02	12	222	4,461	1.67	0	0.00	9,669	3.63	22,422	3.69	0	0.00	26,762	4.41
6	7/04-7/05	12	187	1,578	0.70	0	0.00	6,616	2.95	24,000	2.88	0	0.00	33,378	4.01
Unrestricted Mesh Size Subtotal		39	240	24,000	2.88	0	0.00	33,378	4.01						
2	6/20-6/21	12	230	6,650	2.41	0	0.00	66,067	23.94	6,650	2.41	0	0.00	99,445	8.98
4	6/29	6	209	2,521	2.01	0	0.00	33,062	26.37	9,171	2.28	0	0.00	132,507	10.74
Restricted Mesh Size Subtotal b		18	230	9,171	2.28	0	0.00	99,129	10.74						
Summer Season Total		57	242	33,171	2.28	0	0.00	132,507	10.74						
7	7/26	6	136	18	0.02	2	0.00	9,209	11.29	9,189	1.90	2	0.00	9,209	11.29
8	7/29	6	68	10	0.02	1	0.00	1,138	2.79	9,199	1.76	3	0.00	10,347	8.45
9	8/01	6	79	7	0.01	10	0.02	1,325	2.80	9,206	1.61	13	0.01	11,672	6.87
10	8/05	6	100	2	0.00	77	0.13	3,134	5.22	9,208	1.46	90	0.04	14,806	6.44
11	8/08	6	179	4	0.00	264	0.25	11,324	10.54	9,212	1.25	354	0.10	26,130	7.75
12	8/21	6	201	1	0.00	16,081	13.33	11,043	9.16	9,213	1.07	16,435	3.59	37,173	8.12
Fall Season Total c		36	227	42	1.07	16,435	3.59	37,173	8.12						
Grand Total		93	258	33,213		16,435		169,680							

a Catches reported in numbers of fish sold in the round.
b Six inch maximum mesh size restriction in effect during periods 2 and 4.
c Fall chum salmon season (7/26 to 8/21).

Table 8. Commercial salmon catch and effort data by fishing period, set and drift gill nets combined, District 3, Yukon area, 1990. 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	6/24	18	13	1,413	6.04	0	0.00	392	1.68	1,413	6.04	0	0.00	392	1.68
2	6/27–6/28	9	15	926	6.86	0	0.00	251	1.86	2,339	6.34	0	0.00	643	1.74
Unrestricted Mesh Size Summer Season Total b		27	15	2,339	6.34	0	0.00	643	1.74						
3	7/29	6	8	0	0.00	0	0.00	597	12.44	0	0.00	0	0.00	597	12.44
4	8/01	6	3	2	0.11	0	0.00	115	6.39	2	0.03	0	0.00	712	10.79
5	8/05	6	2	0	0.00	0	0.00	81	0.00	2	0.03	0	0.00	793	10.17
6	8/08	6	11	0	0.00	6	0.09	627	9.50	2	0.01	6	0.04	1,420	9.86
7	8/21	6	18	0	0.00	912	8.44	2,295	21.25	2	0.01	918	3.64	3,715	14.74
Fall Season Total c		30	19	2	0.01	918	3.64	3,715	14.74						
Grand Total		57	22	2,341		918		4,358							

a Catches reported in numbers of fish sold in the round.
b No six inch maximum mesh size periods allowed during summer season.
c Fall chum salmon season (7/29 to 8/21).

Table 9. Commercial salmon and salmon roe sales and effort by fishing period, set gill nets and fishwheels combined, District 4, Yukon Area, 1990. a

Sub-district	Period Dates	Hours Fished	No. of Fishermen	Chinook	Chinook Roe	Chum	Chum Roe b	Coho
				Summer Season				
4-A	6/24-6/25	24	51	1	0	778	5,604	0
	6/27-6/29	48	63	4	0	3,312	26,459	0
	7/01-7/03	48	64	16	8	5,154	42,129	0
	7/04-7/05	24	62	31	0	1,933	21,349	0
Subtotal		144	66	52	8	11,177	95,541	0
4-B,C	6/24-6/25	24	2	55	0	0	22	0
	6/27-6/29	48	8	241	0	39	580	0
	7/01-7/03	48	11	694	0	96	1,582	0
	7/04-7/06	48	16	1,213	0	325	2,261	0
	7/08-7/10	48	16	726	0	440	3,304	0
	7/11-7/13	48	11	555	0	287	2,433	0
Subtotal		264	30	3,484	0	1,187	10,182	0
District 4	Subtotal	408	92	3,536	0	12,364	105,723	0
				Fall Season c				
4-B,C	8/22-8/24	48	7	0	0	1,772	450	0
	8/26-8/28	48	11	0	0	3,217	1,901	0
Subtotal		96	11	0	0	4,989	2,351	0
Grand Total		504	93	3,536	8	17,353	108,074	0

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

Table 10. Commercial salmon and salmon roe sales and effort by fishing period, set gill nets and fish wheels combined, District 5, Yukon Area, 1990. a

Sub-district	Period Dates	Hours Fished	No. of Fishermen	Chinook	Chinook Roe	Chum	Chum Roe b	Coho
				Summer Season				
5-A,B,C	6/30-7/01	48	14	576	0	0	144	0
	7/03-7/05	48	19	1,332	47	4	119	0
	7/06-7/07	24	15	902	0	1	312	0
Subtotal		120	20	2,810	47	5	575	0
5-D	7/06-7/08	48	5	329	0	0	0	0
	7/10-7/11	24	4	214	0	6	19	0
Subtotal		72	5	543	47	6	19	0
District 5	Subtotal	192	25	3,353	47	11	594	0
				Fall Season c				
5-A,B,C	8/28-8/29	24	11	0	0	5,169	945	0
5-D	9/07-9/09	48	4	0	0	2,609	113	0
District 5	Subtotal	72	15	0	0	7,778	1,058	0
Grand Total		264	30	3,353	47	7,789	1,652	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 Fall chum salmon season.

Table 11. Commercial salmon and salmon roe sales and effort by fishing period set gill nets and fishwheels combined, District 6, Yukon Area, 1990. a

Period Dates	Hours Fished	No. of Fishermen	Chinook	Chinook Roe	Chum	Chum Roe	Coho	Coho Roe
				Summer Season				
7/13–7/15	42	21	1,437	970	3,645	778	0	0
7/23–7/25	42	20	161	305	3,107	1,025	0	0
7/27–7/29	42	15	96	253	1,761	727	0	0
7/30–8/01	42	15	55	142	1,720	330	0	0
8/03–8/05	42	15	8	6	2,127	199	0	0
Subtotal	210	23	1,757	1,676	12,360 e	3,059	0	0
				Fall Season				
9/10–9/11 b	24	4	0	0	3,033	0	649	0
9/10–9/12 c	42	12	0	0	7,855	1,716	177	244
9/14–9/16 d	42	7	0	0	1,661	146	110	18
9/17–9/18 b	24	4	0	0	3,527	0	1,016	0
9/17–9/19 c	42	9	0	0	12,047	2,701	2,015	759
9/21–9/23 d	42	7	0	0	2,468	503	744	192
9/24–9/25 b	24	5	0	0	2,694	0	1,508	0
9/24–9/26 c	42	14	0	0	9,030	2,200	4,904	2,556
9/28–9/30 d	42	5	0	0	1,751	269	864	273
Subtotal d	324	27	0	0	44,066 f	7,535	11,987 g	4,042
Grand Total	534	30	1,757	1,676	56,426 e,f	10,594	11,987 g	4,042

a Sales reported in numbers of fish sold in the round and pounds of unprocessed roe.
b Subdistrict 6–A only (total of 72 hours fishing time during fall season).
c Subdistrict 6–B only (total of 126 hours fishing time during fall season).
d Subdistrict 6–C only (total of 126 hours fishing time during fall season).
e Includes 1,278 female summer chum salmon sold with roe extracted and sold separately.
f Includes 884 female fall chum salmon sold with roe extracted and sold separately.
g Includes 438 female coho salmon sold with roe extracted and sold separately.

Table 12. Commercial salmon and salmon roe sales by gear type and by statistical area, Upper Yukon Area, 1990. a,b

Statistical Area	Summer Season											
	Chinook			Chinook Roe			Summer Chum			Summer Chum Roe		
	GN	FW	Subtotal	GN	FW	Subtotal	GN	FW	Subtotal	GN	FW	Subtotal
334–42	88	696	784	0	0	0	0	1,091	1,091	302	6,298	6,600
334–43	1,201	1,499	2,700	0	0	0	96	0	96	740	2,842	3,582
334–44	0	0	0	0	8	8	0	0	0	18,905	8,723	27,628
334–45	0	0	0	0	0	0	0	427	427	6,695	21,486	28,181
334–46	0	52	52	0	0	0	279	10,471	10,750	643	39,089	39,732
Subtotal Dist. 4	1,289	2,247	3,536	0	8	8	375	11,989	12,364	27,285	78,438	105,723
334–51	0	0	0	0	0	0	0	0	0	0	0	0
334–52	633	997	1,630	0	47	47	0	0	0	43	182	225
334–53	502	678	1,180	0	0	0	3	2	5	202	148	350
334–54	0	194	194	0	0	0	0	6	6	0	19	19
334–55	265	84	349	0	0	0	0	0	0	0	0	0
Subtotal Dist. 5	1,400	1,953	3,353	0	47	47	3	8	11	245	349	594
334–61	8	318	326	0	0	0	30	2,832	2,862	12	0	12
334–62	0	1,243	1,243	0	1,355	1,355	0	6,028	6,028	0	1,637	1,637
334–63	0	188	188	0	321	321	0	3,470	3,470	0	1,410	1,410
Subtotal Dist. 6	8	1,749	1,757	0	1,676	1,676	30	12,330	12,360	12	3,047	3,059
Total Upper Yukon	2,697	5,949	8,646	0	1,731	1,731	408	24,327	24,735	27,542	81,834	109,376

–Continued–

Table 12. (p. 2 of 2)

Statistical Area	Fall Season											
	Fall Chum			Fall Chum Roe			Coho			Coho Roe		
	GN	FW	Subtotal	GN	FW	Subtotal	GN	FW	Subtotal	GN	FW	Subtotal
334–42	780	2,626	3,406	610	1,070	1,680	0	0	0	0	0	0
334–43	430	1,153	1,583	340	331	671	0	0	0	0	0	0
334–44	0	0	0	0	0	0	0	0	0	0	0	0
334–45	0	0	0	0	0	0	0	0	0	0	0	0
334–46	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal Dist. 4	1,210	3,779	4,989	950	1,401	2,351	0	0	0	0	0	0
334–51	0	0	0	0	0	0	0	0	0	0	0	0
334–52	1,022	4,147	5,169	0	945	945	0	0	0	0	0	0
334–53	0	0	0	0	0	0	0	0	0	0	0	0
334–54	0	1,758	1,758	0	113	113	0	0	0	0	0	0
334–55	543	308	851	0	0	0	0	0	0	0	0	0
Subtotal Dist. 5	1,565	6,213	7,778	0	1,058	1,058	0	0	0	0	0	0
334–61	351	8,903	9,254	0	0	0	203	2,970	3,173	0	0	0
334–62	81	28,851	28,932	0	6,617	6,617	313	6,783	7,096	0	3,559	3,559
334–63	271	5,609	5,880	0	918	918	220	1,498	1,718	0	483	483
Subtotal Dist. 6	703	43,363	44,066	0	7,535	7,535	736	11,251	11,987	0	4,042	4,042
Total Upper Yukon	3,478	53,355	56,833	950	9,994	10,944	736	11,251	11,987	0	4,042	4,042

a Roe sales expressed in pounds of unprocessed product; District 6 sales include female salmon sold with roe extracted and sold separately. Does not include sales of Department test fishing catches.

b Gear codes: GN – set gill net; FW – fish wheel.

Table 13. Salmon sold from Department test fishing catches, Yukon Area, 1990. a

District/ Subdistrict	Chinook	Summer Chum	Fall Chum	Coho
1	1,063	2,186	2,068	1,194
2	152	752	96	30
Total Lower Yukon b	1,215	2,938	2,164	1,224
6 A	698	2,466	5,782	1,050
6 B	135	2,859	1,278	376
District 6 Upper Yukon Total c	833	5,325	7,060	1,426
Grand Total	2,048	8,263	9,224	2,650

a Sales reported in numbers of fish sold in the round.
b Gill net catches.
c Fish Wheel catches.

Table 14. Yukon River drainage total estimated commercial related salmon catch by district and country, 1990. a

Districts	Chinook			Summer Chum			Fall Chum			Coho		
	Sold in Round	Pounds of Roe	Estimated Harvest b	Sold in Round	Pounds of Roe	Estimated Harvest b	Sold in Round	Pounds of Roe	Estimated Harvest b	Sold in Round	Pounds of Roe	Estimated Harvest b
1	51,161	0	51,161	148,911	0	148,911	27,337	0	27,337	13,354	0	13,354
2	33,213	0	33,213	132,507	0	132,507	37,173	0	37,173	16,435	0	16,435
3	2,341	0	2,341	643	0	643	3,715	0	3,715	918	0	918
Total Lower Yukon	86,715	0	86,715	282,061	0	282,061	68,225	0	68,225	30,707	0	30,707
4–A	52	8	54	11,177	95,541	197,641 c	0	0	0	0	0	0
4–BC	3,484	0	3,484	1,187	10,182	13,420	4,989	2,351	8,166	0	0	0
Subtotal District 4	3,536	8	3,538	12,364	105,723	211,061	4,989	2,351	8,166	0	0	0
5–ABC	2,810	47	2,822	5	575	644	5,169	945	6,243	0	0	0
5–D	543	0	543	6	19	27	2,609	113	2,733	0	0	0
Subtotal District 5	3,353	47	3,365	11	594	671	7,778	1,058	8,976	0	0	0
Subtotal District 6	1,757	1,676	2,156	12,360 d	3,059	14,788 d	44,066 e	7,535	50,974 e	11,987 f	4,042	14,782 f
Total Upper Yukon	8,646	1,731	9,059	24,735	109,376	226,520	56,833	10,944	68,116	11,987	4,042	14,782
Total Alaskan	95,361	1,731	95,774	306,796	109,376	508,581	125,058	10,944	136,341	42,694	4,042	45,489
Total Canada	11,324	0	11,324	0	0	0	27,537	0	27,537	0	0	0
Grand Total	106,685	1,731	107,098	306,796	109,376	508,581	152,595	10,944	163,878	42,694	4,042	45,489

a Includes ADF&G test fishery sales, except for District 6.
b Unless otherwise noted, estimated harvest is the number of fish sold in the round plus the estimated number of females harvested to produce roe sold(pounds of roe sold divided by weighted average roe weight per female).
c Estimated harvest includes both males and females harvested to produce roe sold(pounds of roe sold divided by weighted average roe weight per female divided by average percent females in the harvest). Summer chum salmon sold in the round in District 4–A are assumed to be males and are included in the estimated harvest calculation.
d Includes 1,278 female summer chum salmon sold with roe extracted and sold seperately.
e Includes 884 female fall chum salmon sold with roe extracted and sold seperately.
f Includes 438 female coho salmon sold with roe extracted and sold seperately.

Table 15. Yukon River drainage subsistence and personal use salmon harvest, 1990. a

Village	Survey Date	Fishing Households	Dogs	Chinook	Summer Chum	Fall Chum	Coho	Set Nets	Drift Nets	Fish Wheels
Sheldon Pt.	9/6	12	37	756	1,458	102	78	12	0	0
Alakanuk	9/1	53	93	871	7,265	267	156	42	11	0
Emmonak c	8/30–31	83	97	1,873	15,215	2,353	1,283	27	56	0
Kotlik d	9/7	55	228	3,119	13,061	2,613	1,784	35	19	0
Personal Use	permits	18	0	534	295	60	8	0	18	0
Y–1 Subtotal		221	455	7,153	37,294	5,395	3,309	116	104	0
Mt. Village	9/13	85	189	1,792	9,950	1,566	1,754	16	69	0
Pitkas Pt.	9/11–12	13	34	391	1,438	150	52	3	10	0
St. Marys	9/12	48	138	2,085	8,077	806	463	3	45	0
Pilot Station e	9/14	56	71	3,786	6,698	1,941	1,968	10	46	0
Marshall	9/19	40	343	1,492	2,290	1,724	2,107	7	33	0
Y–2 Subtotal		242	775	9,546	28,453	6,187	6,344	39	203	0
Russian Mission	9/19	27	142	1,694	2,146	878	688	19	8	0
Holy Cross	9/15	33	49	2,337	857	1,178	338	15	18	0
Y–3 Subtotal		60	191	4,031	3,003	2,056	1,026	34	26	0
Lower Yukon Total		523	1,421	20,730	68,750	13,638	10,679	189	333	0
Anvik	9/18	14	137	481	2,032	583	236	7	2	5
Shageluk f	9/17	12	81	62	6,518	0	0	12	0	0
Grayling	9/18	9	44	144	1,430	1,405	10	5	2	2
Kaltag	10/09	39	188	2,244	6,956	2,327	501	6	21	12
Nulato	10/11	55	275	2,788	502	3,546	845	7	23	25
Koyukuk	10/11	12	49	876	283	860	162	5	4	3
Galena	10/08–12	100	252	3,134	1,760	3,202	572	48	19	33
Ruby	10/16	45	131	811	351	3,352	974	24	0	21
Y–4 Subtotal		286	1,157	10,540	19,832 g	15,275	3,300	114	71	101
Tanana	10/25–26	42	588	2,284	5,905	41,145	8,580	17	0	25
Rampart	11/12–13	15	100	1,481	58	10,818	591	9	0	6
Fbks. Sub/Pers h	permits	48	–	2,533	860	4,167	41	43	0	5
Stevens Village	11/1	16	73	1,295	1,671	3,857	479	10	0	6
Beaver	10/18	11	14	721	108	757	172	11	0	0
Ft. Yukon	10/30–31	41	326	4,051	145	11,627	727	11	0	30
Circle/Central i	permits	21	–	2,201	1,377	7,814	221	13	0	8
Eagle j	permits	35	–	1,845	384	8,389	3	32	0	3
Y–5 Subtotal		229	1,101	16,411	10,508	88,574	10,814	146	0	83
Main River Totals		1,038	3,679	47,681	99,090	117,487	24,793	449	404	184

–Continued–

Table 15. Yukon River drainage subsistence and personal use salmon harvest, 1990 (continued). a

Village	Survey Date	Fishing Households	Dogs	Chinook	Summer Chum	Fall Chum	Coho	Set Nets	Drift Nets	Fish Wheels
Manley k	Permits	28	–	1,509	2,637	28,885	8,808	20	–	8
Minto l	Permits	17	–	249	785	6,800	2,436	10	–	7
Nenana m	Permits	34	–	1,441	1,515	13,956	8,051	17	–	17
Healy n	Permits	3	–	0	0	2,283	1,774	2	–	1
Fbks Pers–use o	Permits	120	–	560	1,134	1,789	1,288	97	–	23
Y–6 Subtotal		202	0	3,759	6,071	53,713	22,357	146	0	56
Huslia	10/16	15	128	198	7,368	846	235	15	0	0
Hughes	10/15–16	10	44	90	509	70	43	10	0	0
Allakaket/Alatna	10/22–23, 11/7 p	14/5	137	356	5,343	3,050	36	19	0	0
Koyukuk R. Subtotal		53	309	644	13,220	3,966	314	44	0	0
Venetie	11/1	13	112	29	0	5,377	348	13	0	0
Chalkyitsik	11/1–11/2	6	73	0	90	1,490	4	6	0	0
Subtotal Chandalar/Black Rivers		19	185	29	90	6,867	352	19	0	0
Subtotal Upper Yukon (Alaska)		789	2,752	31,383	49,721	168,395	37,137	469	71	240
Yukon River Drainage (Alaska) Total		1,312	4,173	52,113	118,471	182,033	47,816	658	404	240
Old Crow q		–	–	247	–	2,410	–	–	–	–
Yukon River Mainstem Canada q		–	–	7,656	–	3,675	–	–	–	–
Yukon Territory q, Totals		–	–	7,903	–	6,085	–	–	–	–
Grand Total Yukon River Drainage		1,312	4,173	60,016	118,471	188,118	47,816	658	404	240

a Data collected by Commercial Fisheries Division. Catch data, number of fishing households, and number of dogs are expanded. Gear data is the estimated number used by the fishing households.
b Estimated number of households that fished.
c Includes 944 chinook, 1,838 summer chum, 1,165 fall chum and 870 coho salmon from ADF&G test fish catches.
d Includes 1,323 chinook, 2,189 summer chum, 944 fall chum and 713 coho salmon from ADF&G test fish catches.
e Includes 542 chinook, 1,882 summer chum, 1,077 fall chum and 869 coho salmon from ADF&G test fish catches.
f Shageluk harvest data from households fishing mainstream Yukon River and Innoko River.
g Does not include fish taken during commercial roe fishery used for subsistence.
h Data from fishermen that fished between Hess Creek and Dall River (haul road bridge area). Of the 63 permits issued, 57 returned their permits and 42 fished. Estimate 48 fishing households. Does not include residents of Stevens Village who were issued permits.
i Includes Circle and vicinity, and Central. Of the 29 permits issued, 24 returned their permits and 18 fished. Estimate 21 fishing households.
j Includes Eagle and vicinity, Eagle village, Chicken, and Tok. Of the 49 permits issued, 48 returned their permits and 34 fished. Estimate 35 fishing households.
k Manely, of the 36 permits issued, 32 returned their permits and 24 fished. Estimate 28 fishing households. Includes 548 chinook, 416 summer chum, 4,042 fall chum, and 1,357 coho salmon given away from ADF&G test fishwheel.
l Minto, of the 25 permits issued, 15 returned their permits and 7 fished. Estimate 17 fishing households.
m Nenana, of the 46 permits issued, 42 returned their permits and 30 fished. Estimate 34 fishing households. Includes 418 chinook, 443 summerchum, and 329 fall chum salmon from ADF&G test fishwheel.
n Healy, of the 5 permits issued, 5 returned their permits and 3 fished.
o Data from permitted fishermen who fished the Tanana River. Of the 175 permits issued, 166 returned their permits and 11 fished. Estimate 120 fishing households.
p Includes 24 summer chum salmon from Bettles.
q Indian Food Fish, Domestic, and Sport (300 chinook) catch data from Department of Fisheries & Oceans, Whithorse, Yukon Territory.

Table 16. Subsistence and personal use salmon catches taken under authority of a permit, Yukon River area, 1990.

Location	Number Issued	Number Returned	Percent Returned	Number Not Fished b	Reported Harvest				Expanded Harvest b			
					Chinook	SChum	FChum	Coho	Chinook	SChum	FChum	Coho
Personal Use Permits												
District 1	19	16	84%	1	450	256	60	8	534	295	60	8
District 5												
Near Haul Road Bridge	38	35	92%	10	1,527	641	3,723	18	1,659	695	4,041	18
Circle/Eagle	5	5	100%	1	240	0	13	5	240	0	13	5
Other	3	1	33%	0	2	0	0	0	6	0	0	0
District 6 Tanana River												
Subdistrict 6-A	1	1	100%	1	0	0	0	0	0	0	0	0
Subdistrict 6-B	4	4	100%	1	9	12	40	35	9	12	40	35
Subdistrict 6-C	152	144	95%	42	442	918	1,353	1,120	466	966	1,425	1,184
Personal Use Total	222	206	93%	56	2,670	1,827	5,189	1,186	2,914	1,968	5,579	1,250
Subsistence Permits												
District 5												
Near Haul Road Bridge	26	25	96%	9	2,033	3,493	1,109	455	2,114	3,633	1,153	473
Circle/Eagle	80	74	93%	21	3,670	1,629	14,979	201	3,970	1,761	16,191	219
District 6 Tanana River												
Subdistrict 6-A c	42	36	86%	10	821	1,834	23,915	7,051	1,507	2,556	31,941	9,584
Subdistrict 6-B d	70	58	83%	20	816	1,523	16,003	9,155	1,402	2,279	19,644	11,051
Subdistrict 6-C	19	18	95%	12	15	69	279	50	16	73	294	53
Upstream of Subdistrict 6-C	1	1	100%	1	0	0	0	0	0	0	0	0
Subsistence Total	238	212	89%	73	7,355	8,548	56,285	16,912	9,009	10,301	69,223	21,380
Delta River Carcasses e	7	7	100%	4	0	0	750	0	0	0	750 e	0
Grand Total e	460 e	418 e	91%	129 e	10,025	10,375	61,474 e	18,098	11,923	12,269	74,802 e	22,630

a The number of fishermen that did not fish based on returned permits.
b Expanded harvest equals reported harvest divided by permits returned multiplied by permits issued.
c Reported and expanded harvest includes 548 chinook, 416 summer chum, 4,042 fall chum, and 1,357 coho salmon given away by Department test fishing project.
d Reported and expanded harvest includes 418 chinook, 443 summer chum, and 329 fall chum salmon given away by Department test fishing project.
e Delta River carcass data is not included in subsistence use and grand totals because live fish are not harvested.

Table 17. Yukon River drainage total utilization of salmon by district and country, 1990. a

District	Fishery	Chinook	Summer Chum	Fall Chum	Coho
1	Commercial	51,161	148,911	27,337	13,354
	Subsistence	7,153	37,294	5,395	3,309
	Total	58,314	186,205	32,732	16,663
2	Commercial	33,213	132,507	37,173	16,435
	Subsistence	9,546	28,453	6,187	6,344
	Total	42,759	160,960	43,360	22,779
3	Commercial	2,341	643	3,715	918
	Subsistence	4,031	3,003	2,056	1,026
	Total	6,372	3,646	5,771	1,944
Total Lower Yukon	Commercial	86,715	282,061	68,225	30,707
	Subsistence	20,730	68,750	13,638	10,679
	Total	107,445	350,811	81,863	41,386
4	Commercial	3,536	12,364	4,989	0
	Subsistence b	11,182	33,052	16,064	3,614
	Commercial Related c	2	198,697	3,177	0
	Total	14,720	244,113	24,230	3,614
5	Commercial	3,353	11	7,778	0
	Subsistence d	16,428	10,598	94,243	11,166
	Commercial Related e	12	660	1,198	0
	Total	19,793	11,269	103,219	11,166
6	Commercial f	1,757	12,360	44,066	11,987
	Subsistence	3,360	6,071	46,805	19,562
	Commercial Related e	399	2,428	6,908	2,795
	ADF&G TF Sales	833	5,325	7,060	1,426
	Total	6,349	26,184	104,839	35,770
Total Upper Yukon	Commercial	8,646	24,735	56,833	11,987
	Subsistence	30,970	49,721	157,112	34,342
	Commercial Related	413	201,785	11,283	2,795
	ADF&G TF Sales	833	5,325	7,060	1,426
	Total	40,862	281,566	232,288	50,550
Total Yukon Area (Alaska)	Commercial	95,361	306,796	125,058	42,694
	Subsistence	51,700	118,471	170,750	45,021
	Commercial Related	413	201,785	11,283	2,795
	ADF&G TF Sales	833	5,325	7,060	1,426
	Total	148,307	632,377	314,151	91,936
Total Canada	Commercial	11,324	0	27,537	0
	Subsistence g	7,903	0	6,085	0
	Total	19,227	0	33,622	0
Grand Total	Commercial	106,685	306,796	152,595	42,694
	Subsistence	59,603	118,471	176,835	45,021
	Commercial Related	413	201,785	11,283	2,795
	ADF&G TF Sales	833	5,325	7,060	1,426
	Total	167,534	632,377	347,773	91,936

a Personal use catches included with subsistence; does not include female salmon harvested to produce roe sales. Commercial includes only fish sold in the round. ADF&G test fishery sales included in commercial harvest, except for District 6.
b Includes Innoko and Koyukuk River drainages.
c Commercial related refers to harvest of females to produce roe sold; the harvest of male summer chum salmon not sold is also included in District 4.
d Includes Chandalar and Black River drainages.
e Commercial related refers to harvest of females to produce roe sold.
f Commercial includes 1,278 female summer chum, 884 female fall chum and 438 female coho salmon sold with roe extracted and sold seperately.
g Combined Indian Food, Domestic, and Sport (300 chinook) Fisheries.

Table 18. Salmon spawning escapement index counts and population estimates in the Yukon River drainage, 1990. a

Stream (drainage)	Date	Survey Rating	Chinook	Summer Chums	Fall Chums	Coho
Andreafsky River						
East Fork (Aerial)	7/21,7/12	Fair,Poor	2,503	11,519 u	--	--
West Fork (Aerial)	7/21,7/12	Fair,Poor	1,545	20,426 u	--	--
	Subtotal		4,048	31,945 u	--	--
Yukon River (Pilot Station)						
Main River Sonar b,c	6/5-9/4		(129,880)	(935,884)	(485,083)	(231,714)
Atchuelinguk River	7/28	Good	815	1,449	--	--
Anvik River						
Aerial Counts						
Mainstem River	7/20	Good	2,087	--	--	--
Yellow Ri-McDonald Cr	7/20	Good	(1,595)	--	--	--
Beaver Creek	7/20	Good	180	--	--	--
Canyon Creek	7/20	Good	6	--	--	--
Otter Creek	7/20	Good	30	--	--	--
Swift River	7/20	Good	29	--	--	--
McDonald Creek	7/20	Good	15	--	--	--
Sonar Count d	6/21-7/29		--	400,000 c	--	--
	Subtotal		2,347	400,000 c	--	--
Simon Creek	7/25	Fly-over	--	279	--	--
Blackburn Creek	7/25	Fly-over	--	34	--	--
Rodo River	7/25	Poor	69	1,941	--	--
Nulato River						
South Fork	7/25	Poor	430	3,196	--	--
North Fork	7/25	Poor	568	1,419	--	--
	Subtotal		998	4,615	--	--
Koyukuk River Drainage						
Gisasa River	7/25	Poor	884	450	--	--
Kateel River	7/25	Poor	185	338	--	--
Hogatza River						
Clear Creek	7/26	Poor	--	1,006	--	--
Caribou Creek	7/26	Poor	--	1,171	--	--
	Subtotal		--	2,177	--	--

-Continued-

Table 18. (p 2 of 5)

Stream (drainage)	Date	Survey Rating	Chinook	Summer Chums	Fall Chums	Coho
Indian River	7/26	Poor	--	781	--	--
Henshaw Creek	8/1	Good-Fair	369	1,237	--	--
South Fork Koyukuk River d,e	7/25-9/30		--	--	20,081 c	--
South Fork Koyukuk River	8/1	Fair	142	--	--	--
Jim River	8/1	Fair	146	233	--	--
	Subtotal		288	233	20,081	--
Total Koyukuk River			1,378	5,216	20,081	--
Melozi Hot Springs	7/26	Poor	--	349	--	--
Tozitna River	7/26	Fair	149	36	--	--
Total Lower Yukon River			9,804	445,864	20,081	--
Lower Tanana River Drainage						
Kantishna River Drainage						
Toklat River						
Barton Creek	7/25	Poor	123	--	--	--
Floodplain vic Rdhse f	10/15-21	Good	--	--	17,081	216
Geiger Creek f	10/15-21	Good	--	--	2,414	211
Sushana River f	10/15-21	Good	--	--	7,052	95
Population Estimate g			--	--	(33,672)	--
	Subtotal		123	--	26,547	522
Clear Creek	7/25	Poor	12	--	--	--
Bearpaw River	7/30	Good	180	--	--	--
Nenana River Drainage						
Mainstem upstream Teklanika R	10/10	Good	--	--	--	1,300
Teklanika River eastern spring adjacent to Comma Lake	10/10	Good	--	--	--	210
Seventeen Mile Slough	7/25,30,10/25	Fr,Gd, Pr	77	200	--	15
Lost Slough	10/10	Good	--	--	--	688
	Subtotal		77	200	--	2,221

-Continued-

Table 18. (p 3 of 5)

Stream (drainage)	Date	Survey Rating	Chinook	Summer Chums	Fall Chums	Coho
Chatanika River (aerial)	7/30	Fair–Poor	61	--	--	--
Weir i	7/8–11,20–28		(56)	262	--	--
Chena River						
Mainstem River (aerial)	7/27	Fair–Poor	1,436	100	--	--
MCD to Middle Fk (index area)	7/27	Fair–Poor	(1,402)	--	--	--
Population Estimate h,i			(5,603)	--	--	--
	Subtotal		1,436	100	--	--
Salcha River						
Mainstem River (aerial)	7/27	Good	3,744	450	--	--
TAPS to Caribou Cr (index aerial)	7/27	Good	(3,429)	--	--	--
Population Estimate h,i			(10,728)	--	--	--
	Subtotal		3,744	450	--	--
Total Lower Tanana River			5,633	1,012	26,547	2,743
Upper Tanana River Drainage						
Open water vic upper Salchaket Sl	10/25	Good	--	--	47	--
Open water vic Flag Hill	10/25	Good	--	--	92	--
Open water vic of Little Delta R mo	10/25	Good	--	--	472	--
Open water vic Canyon Cr Camp	10/25	Good	--	--	70	--
Open water vic Delta Cr	10/25	Good	--	--	20	--
Richardson Clearwater River	10/25	Good	--	--	389	--
Mainstem Tanana sloughs between Shaw Creek and Timber	10/25,26	Good	--	--	3,695	--
South Bank Tanana	10/25	Fair	--	--	475	--
Delta River						
Foot Survey (peak count)	11/19,11/2	Good	--	--	5,373	10
Whitestone Cr	11/2	Good	--	--	--	71
Population Estimate g			--	--	(8,992) c	--
Goodpaster River	7/27	Fair	510	--	--	--
Bluff Cabin Slough						
Aerial	10/25	Good	--	--	(670)	0
Foot Survey	11/2	Good	--	--	1,632	--
Bluff Cabin Spring	10/25	Good	--	--	100	105
Clearwater Lake Outlet Slough	10/25	Good	--	--	176 f	5
Clearwater Lake and Outlet	10/25,10/26 i	Good	--	--	104	2,375 i,j
Delta Clearwater River i,j	10/26	Good	--	--	--	8,325
Onemile Slough	10/25	Poor	--	--	5	--
Total Upper Tanana River			510	0	12,650	10,891
Total Tanana River			6,143	1,012	39,197	13,634

–Continued–

Table 18. (p 4 of 5)

Stream (drainage)	Date	Survey Rating	Chinook	Summer Chums	Fall Chums	Coho
Chandalar River (Aerial)	9/25	Good	--	--	(11,890)	--
Sonar Estimate d,e	8/10-9/27		--	--	78,631 c	--
Porcupine River Drainage						
Sheenjek River (Aerial)	8/31	Poor-Incom.	--	--	(421)	--
Sonar Estimate d	8/24-9/25		--	--	65,721 c	--
Fishing Branch River (Aerial) k	10/26	Good	--	--	7,541 c	--
Total Porcupine River			--	--	73,262	--
Total Alaskan Portion of Drainage			15,947	446,876	203,630 m	13,634
Yukon Territory Streams						
Fortymile River j,w	8/8		20	--	--	--
White River						
Donjek River						
Kluane River k	10/19	Poor-Fair	--	--	4,393	--
Tincup Creek	8/18	Fair	83	--	--	--
Koidern River k	10/19	Good	--	--	1	--
	Subtotal		83	--	4,394	--
Pelly River						
Ross River	8/17	Poor	300	--	--	--
Lewis Lake Outlet	8/17	Poor	157	--	--	--
Hoole River	8/17	Good	57	--	--	--
	Subtotal		514	--	--	--
Tatchun Creek f,k	8/17	Good	643	--	--	--
Little Salmon River	8/16	Fair	665	--	--	--
Big Salmon River						
Big Salmon Lake to Scurvy Cr	8/15	Good	568	--	--	--
Scurvy Cr to Moose Cr	8/15	Good	494	--	--	--
Moose Cr to DFO weir	8/15	Good	516	--	--	--
DFO weir to Bat Cr	8/15	Good	58	--	--	--
Bat Cr to Souch Cr	8/15	Good	170	--	--	--
Souch Cr to South Big Salmon	8/15	Flyover	441	--	--	--
South to North Big Salmon	8/15	Good	194	--	--	--
North Big Salmon mouth to Northern Lk outlet	8/15	Flyover	95	--	--	--
Northern Lk Outlet	8/15	Flyover	50	--	--	--
	Subtotal		2,586	--	--	--
Teslin River Drainage						
Mainstem Teslin River k	11/1	Good	--	--	720	--
Nisutlin River	8/15-17	Good-Fair	1,017	--	--	--
Wolf River	8/16	Fair	380	--	--	--
	Subtotal		1,397	--	720	--

-Continued-

Table 18. (p 5 of 5)

Stream (drainage)	Date	Survey Rating	Chinook	Summer Chums	Fall Chums	Coho
Whitehorse Fishway Counts k	7/25–8/30		1,407 n	--	--	--
Mainstem Yukon River						
Tatchun Creek to Ft Selkirk k	10/18	Fair	--	--	3,547	--
Population Estimate h,k			(57,502) c,p	--	(81,656) c,p	--
	Subtotal		--	--	3,547	--
Total Yukon Territory (observed)			7,315	--	16,202 m	--
Total Yukon Territory (estimated) q			(37,707) c,q	--	(51,755) c,q	
Yukon River Drainage Totals			23,610	446,876	219,832	13,634

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 Foot survey.
g Population estimate based upon replicate foot surveys and streamlife data.
h Population estimate based upon mark and recapture study
i Sport Fish Division estimate.
j Boat survey.
k Canadian Department of Fisheries and Oceans (DFO) estimate.
m Total for Alaskan portion of drainage does not include Fishing Branch River. Total for Yukon Territory includes Fishing Branch River.
n Only 1,236 of the chinook salmon which returned to the Fishway were passed; 95 females and 76 males were taken for hatchery brood stock; 71 of these females were artifically spawned (average fecundity was 5,792 eggs). The number of clipped chinook salmon which returned to the fishway totaled 292.
p Canadian estimates for Yukon Territory streams excluding the Fishing Branch River. Commercial and subsistence catches have not been removed from these estimates. These are "border" escapement estimates.
q Estimated spawning escapement from DFO tagging study (border population estimate minus harvest).
u This is an aerial estimate of "salmon" present. The count includes both pink and chum salmon; no estimate of species composition was made by the observer.
w Habitat Division observations.

Table 19. Yukon River salmon interim escapement objectives for selected species and streams. 1990. a

Stream	Interim Escapement Objectives a		
	Chinook	Summer Chum	Fall Chum
Andreafsky River			
East Fork	1,600 c	109,000 c	
West Fork	1,000 c	116,000 c	
Anvik River			
Mainstem			
Yellow River to McDonald Cr	500 c		
Goblet Cr to McDonald Cr		356,000 c	
Sonar b		487,000 b,d	
Nulato River			
North Fork	500 c	53,000 c	
South Fork	500 c		
Hogatza River			
Clear Creek		8,000 c	
Caribou Creek		9,000 c	
Gisasa River	650 c		
Chena River			
Mainstem from Flood Control Dam to Middle Fork	1,700 c		
Salcha River	2,500 c,h	3,500 c	
Sheenjek River			62,000 e
Fishing Branch River (YT)			50,000–120,000 f
Toklat River			33,000 e
Delta River			11,000 e
Mainstem Yukon River (Canadian Border)	33,000–43,000 b,g		

a Interim escapement objectives represent the minimum number of desired spawners and are based upon historical performances. Interim objectives 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 Interim escapement of total spawning abundance based upon sonar, weir, and mark and recapture, or expansions from inseason point estimates.

c Interim escapment objectives developed by ADF&G in 1983 as a range and were established as a single objective using the upper end of the range in 1987 and 1988.

d Optimum number calculated from escapement–return relationships.

e Interim escapement objectives developed by ADF&G in November 1987 (B.O.F.).

f Interim escapement objective developed by US/Canada JTC in October 1987.

g Interim escapement objective developed by US/Canada JTC in March 1987.

h Interim escapement objective established by ADF&G in March 1990; original objective was developed in 1983 in the form of a range (1,500–3,500).

Table 20. Commercial herring catch and effort data by fishing period, Cape Romanzof District, 1990.

Date	Time of Fishery	Hours Fished	Number			Period Catch (st)			
			Fishermen	Vessels	Landings	Bait	Sac Roe	Total	Roe %
May 23–24	2230–0130	3	95	90	158	10.8	318.2	329.0	8.40
Total		3	95	90	158	10.8	318.2	329.0	8.40

Appendix Table 1. Alaskan and Canadian total utilization of Yukon River salmon, 1903–1990. a

Year	Alaska			Canada			Total		
	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

–Continued–

Year	Alaska			Canada			Total		
	Chinook	Other Salmon	Total	Chinook	Other Salmon	Total	Chinook	Other Salmon	Total
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	1,631,479	1,760,944	5,881	9,566	15,447	135,346	1,641,045	1,776,391
1979	158,678	1,631,072	1,789,750	10,375	22,084	32,459	169,053	1,653,156	1,822,209
1980	196,709	1,730,410	1,927,119	22,546	22,218	44,764	219,255	1,752,628	1,971,883
1981	187,708	2,097,214	2,284,922	17,809	22,281	40,090	205,517	2,119,495	2,325,012
1982	151,802	1,264,580	1,416,382	17,208	16,091	33,299	169,010	1,280,671	1,449,681
1983	197,388	1,677,390	1,874,778	18,952	29,490	48,442	216,340	1,706,880	1,923,220
1984	162,332	1,546,685	1,709,017	16,795	29,267	46,062	179,127	1,575,952	1,755,079
1985	185,959	1,655,909	1,841,868	19,301	41,265	60,566	205,260	1,697,174	1,902,434
1986	145,208	1,756,395	1,901,603	20,364	14,493	34,857	165,572	1,770,888	1,936,460
1987 b	187,884	1,244,038	1,431,922	17,664	44,480	62,144	205,548	1,288,518	1,494,066
1988	148,011	2,312,894	2,460,905	21,427	33,565	54,992	169,438	2,346,459	2,515,897
1989	153,560	2,258,048	2,411,608	17,944	23,020	40,964	171,504	2,281,068	2,452,572
1990	148,307	1,038,464	1,186,771	19,227	33,622	52,849	167,114	1,059,943	1,239,620

a Commercial and subsistence harvest combined in numbers of fish, including "equivalent fish" (typically 1 lb of roe per female) 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.
b Includes estimates of catches involved in illegal salmon and salmon roe sales.

Appendix Table 2. Commercial chinook salmon sales by district and country, Yukon River drainage, 1961–1990. a

Year	Lower Yukon Area				Upper Yukon Area				Alaska Total	Canada Total	Grand Total
	Dist. 1	Dist. 2	Dist. 3	Subtotal	Dist. 4	Dist. 5	Dist. 6	Subtotal			
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	3,758 b	3,338 c	8,620	134,760	10,864	145,624
1988	57,109	35,188	1,767	94,064	3,159	3,436	762	7,357	101,421	13,217	114,638
1989	59,153	33,225	1,645	94,023	2,790	3,286	1,741 d	7,817	101,840	9,789	111,629
1990	51,161	33,213	2,341	86,715	3,536 e	3,353 f	1,757 d,g	8,646	95,361	11,324	106,685
5 Yr Ave 1980–84	86,893	42,969	3,803	133,665	1,103	4,785	1,139	7,027	140,692	9,929	150,621
5 Yr Ave 1985–89	67,190	41,217	1,788	110,195	1,728	3,326	1,587	6,641	116,836	11,448	128,284

a Sales reported in numbers of fish sold in the round.
b Includes illegal sales of 653 chinook salmon.
c Includes illegal sales of 2,136 chinook salmon.
d Does not include: 440 chinook salmon sold as part of a test fishing project in 1989, 833 chinook salmon sold as part of a test fishing project in 1990.
e Does not include: 8 pounds of chinook salmon roe sold in 1990.
f Does not include: 47 pounds of chinook salmon roe sold in 1990.
g Does not include: 1,676 pounds of chinook salmon roe sold in 1990.

Appendix Table 3. Commercial summer chum salmon sales by district, Yukon River drainage, 1961–1990. a

Year	Lower Yukon Area				Upper Yukon Area							Alaska Total	
					Dist. 4		Dist. 5		Dist. 6				
	Dist. 1	Dist. 2	Dist. 3	Subtotal	Numbers	Roe b	Numbers	Roe b	Numbers	Roe b	Subtotal 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	1,206	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
1988	648,198	425,172	13,965	1,087,335	24,051	254,526	722	363	40,129	1,646	64,902	256,535	1,152,237
1989	547,631	343,962	7,578	899,171	18,554	283,305	154	373	42,115 c	4,871	60,823	288,549	959,994
1990	148,911	132,507	643	282,061	12,364	105,723	11	594	12,360 c	3,059	24,735	109,376	306,796
5 Yr Ave 1980–84	378,353	265,590	23,805	667,748	43,721	157,821	518	395	34,097	1,428	78,337	159,643	746,085
5 Yr Ave 1985–89	409,468	284,107	5,456	699,031	16,981	235,187	526	156	42,050	2,131	59,556	237,474	758,587

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 Does not include the following: 6,267 summer chum salmon sold as part of a test fishing project in 1989, 5,325 summer chum salmon sold as part of a test fishing project in 1990.

Appendix Table 4. Commercial fall chum salmon sales by district and country, Yukon River drainage, 1961–1990. a

Year	Lower Yukon Area				Upper Yukon Area										
					Dist. 4		Dist. 5		Dist. 6						
	Dist. 1	Dist. 2	Dist. 3	Subtotal	Numbers	Roe b	Numbers	Roe b	Numbers	Roe b	Subtotal Numbers	Total Roe b	Total Numbers	Canada Total	Grand 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	40,591	40,591
1988	45,529	31,861	2,090	79,480	15,662	1,421	16,989	0	21,844 c	1,806	54,495	3,227	133,975	30,263	164,238
1989	77,876	97,906	15,332	191,114	11,776	3,407	18,215	3,989	49,090 c	7,353	79,081	14,749	270,195	17,549	287,744
1990	27,337	37,173	3,715	68,225	4,989	2,351	7,778	1,058	44,066 c	7,535	56,833	10,944	125,058	27,537	152,595
5 Yr Ave 1980–84	115,054	98,359	10,965	224,377	11,212	2,001	42,007	1,532	21,383	1,368	74,602	4,900	298,980	16,899	315,878
5 Yr Ave 1985–89	62,541	44,313	5,076	111,930	10,787	1,471	16,519	877	23,036	1,868	50,342	4,216	162,271	27,123	189,394

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.
c Does not include: 27,008 fall chum salmon sold as part of a test fishing project in 1988, 16,984 fall chum salmon sold as part of a test fishing project in 1989, 7,060 fall chum salmon sold as part of a test fishing project in 1990.

Appendix Table 5. Commercial coho salmon sales by district, Yukon River drainage, 1961–1990. a

Year	Lower Yukon Area				Upper Yukon Area				Alaska Total
	Dist. 1	Dist. 2	Dist. 3	Subtotal	Dist. 4	Dist. 5	Dist. 6 b	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
1988	36,435	34,776	1,419	72,630	2	8	13,972 b	13,982	86,612
1989	24,672	38,522	3,988	67,182	3	84	16,084 b	16,171	83,353
1990	13,354	16,435	918	30,707	0	0	11,987 c	11,987	42,694
5 Yr Ave 1980–84	13,428	14,062	225	27,715	228	0	5,029	5,257	32,972
5 Yr Ave 1985–89	22,721	22,324	1,274	46,320	189	18	8,452	8,659	54,978

a Sales reported in numbers of fish sold in the round.
b Does not include: 13,295 coho salmon sold as part of a test fishing project in 1988, 2,140 coho salmon sold as part of a test fishing project in 1989, 1,426 coho salmon as part of a test fishing project in 1990.
c An additional 3,888 pounds of coho salmon roe sold in 1990.

Appendix Table 6. Yukon River drainage total estimated commercial related summer chum salmon catch by area and district, 1968–1990. a

Year	Lower Yukon Area Total	Upper Yukon Area										Upper Yukon Total c	Alaska Total c
		District 4				District 5			District 6				
		Sold in Round	Females b	Unsold Males	Subtotal c	Numbers	Females b	Subtotal c	Numbers	Females b	Subtotal c		
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	0	283,384	456	–	456	35,855	3,282	39,137	322,977	1,067,715
1981	913,507	59,718 d	187,032	83,695 e	330,445	1,236	49	1,285	32,477	1,987	34,464	366,194	1,279,701
1982	435,946	3,647 d	151,281	102,791 e	257,719	213	21	234	21,597	1,517	23,114	281,067	717,013
1983	713,856	6,672 d	148,125	100,591 e	255,388	42	1,856	1,898	24,309	18	24,327	281,613	995,469
1984	530,694	1,009 d	166,842	110,219 e	278,070	645	47	692	56,249	335	56,584	335,346	866,040
1985	437,377	12,007 d	247,085	168,391 e	427,483	700	–	700	66,913	1,540	68,453	496,636	934,013
1986	669,996	300 d	269,545	195,690 f	465,535	690	–	690	50,483	2,146	52,629	518,854	1,188,850
1987	401,275	29,991 d	121,474	58,335 f	209,800	362	44	406	10,610	450	11,060	221,266	622,541
1988	1,087,335	24,051 d	283,753	182,270 f	490,074	722	405	1,127	40,129	1,835	41,964	533,165	1,620,500
1989	899,171	18,554 d	316,222	175,468 g	510,244	154	416	570	42,115	5,436	47,551	558,365	1,457,536
1990	282,061	12,364 d	–	–	211,061 h	11	660	671	12,360 i	2,428	14,788	226,520	508,581
5 Yr Ave 1985–89	699,031	16,981	247,616	156,031	420,627	526	173	699	42,050	2,281	44,331	465,657	1,164,688

a Does not include Department test fishing sales.

b Estimated by dividing pounds of unprocessed roe by 1 lb of roe per female (1978–1987), 0.897 lbs (1988), and 0.896 lbs (1989), which was calculated from data collected in District 4.

c Note: many females with roe extracted and incidental males are reported as subsistence catches during subsistence surveys.

d Assume all fish sold in the round were males.

e Calculated by dividing estimated number of females by proportion of females captured at Stink Creek test fishwheel (1981 – .566; 1982 – .587; 1983 – .580; 1984 – .600; and 1985 – .578), subtracted by pounds of roe and fish sold in the round.

f Calculated by dividing estimated number of females by proportion of females captured at Stink Creek test fishery (1981–1985 average – .579), subtracted by pounds of roe and fish sold in the round.

g Estimate of number of males taken which were not sold based on mean proportion of females (0.62) sampled in District 4 in 1989.

h Estimated number of males and females harvested to produce roe sold. It is assumed that summer chum sold in the round were primarily males that are estimated in the expansion (pounds roe sold divided by weighted average roe weight divided by average percent female).

i Includes 1,278 female summer chums sold with roe extracted and sold seperately. The estimated harvest of females to produce roe sold is decreased by similar amount.

Appendix Table 7. Commercial Fisheries Entry Commission (CFEC) salmon permits issued by gear type, Yukon Area, 1976–1990. a

Year	Lower Yukon Gill Net b		Upper Yukon Set Gill Net		Upper Yukon Fishwheel	
	Permits Issued c	Permits Fished	Permits Issued c	Permits Fished	Permits Issued c	Permits Fished
1976	678	d	118	d	169	d
1977	700	609	69	44	160	130
1978	699	650	71	47	158	137
1979	708	661	70	50	165	129
1980	709	654	71	52	163	128
1981	711	666	70	45	162	125
1982	710	664	76	45	166	111
1983	708	655	73	40	164	115
1984	708	674	73	39	159	99
1985	708	664	71	40	159	113
1986	707	670	71	30	161	101
1987	706	656	71	33	161	108
1988	707	677	71	43 e	160	127 e
1989	716	687 e	75	42 e	160	127 e
1990	718	679 e	71	37 e	157	116 e

a Information for 1976–1990 obtained from CFEC unless otherwise indicated.
b Set or drift gill net.
c Includes permanent and interim–use permits.
d Information unavailable.
e Data source: ADF&G.

Appendix Table 8. Number of commercial salmon fishing gear operators (permit holders) by district, Yukon area, 1971–1990. a

EARLY 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
1988	437	234	13	684	95	28	33	156	840
1989	434	236	16	686	98	32	29	159	845
1990	452	240	15	707	92	27	23	142	849

LATE 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	548	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
1988	453	258	24	735	20	20	32	72	807
1989	445	243	23	711	20	24	28	72	783
1990	301	227	19	547	11	11	27	49	596

COMBINED SEASON

	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	481	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
1988	460	260	24	744	97	35	38	170	914
1989	452	257	23	732	99	38	32	169	901
1990	459	258	22	739	92	31	30	153	892

a Actual number of gear operators which delivered. 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 6" or smaller mesh size restriction 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, 1974–1990.

District 1

Year	334–11	334–12	334–13	334–14	334–15	334–16	334–17	334–18	Total
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	23,523	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
1988	6,780	11,154	6,023	4,274	14,123	618	8,703	5,434	57,109
1989	2,213	5,703	4,794	3,999	12,682	7,303	18,037	4,422	59,153
1990	1,473	7,315	4,478	4,257	12,486	2,794	14,619	3,739	51,161

District 2

Year	334–21	334–22	334–23	334–24	334–25	Total
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
1988	6,191	11,605	4,721	6,784	5,887	35,188
1989	5,257	12,380	4,647	4,411	6,530	33,225
1990	5,592	10,675	3,741	8,514	4,691	33,213

District 3

Year	334–31	334–32	Total
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
1988	1,387	380	1,767
1989	1,623	22	1,645
1990	2,128	213	2,341

Appendix Table 10. Commercial chinook salmon catches by statistical area, Upper Yukon Area, 1974–1990. a

	District 4 Chinook Salmon Catch by Statistical Area															
	334–41		334–44		334–45		334–46		334–41,44,45 and 46 Subtotal c		334–42		334–43		Total	
Year	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe
1974	0	–							0	–	685	–	–	–	685	–
1975	15	–							15	–	374	–	–	–	389	–
1976	44 b	–							44	–	365	–	–	–	409	–
1977	317	–							317	–	668	–	–	–	985	–
1978	183	–							183	–	425	–	–	–	608	–
1979	785	–							785	–	370	–	834	–	1,989	–
1980	352	–							352	–	549	–	620	–	1,521	–
1981	106	–							106	–	867	–	374	–	1,347	–
1982	78	–							78	–	497	–	512	–	1,087	–
1983	0	–							0	–	382	–	219	–	601	–
1984	2	–							2	–	272	–	687	–	961	–
1985	0	–							0	–	318	–	346	–	664	–
1986	11	–							11	–	100	–	391	–	502	–
1987	91	–							91	–	999	–	434	–	1,524	–
1988	19	–							19	–	1,599	–	1,541	–	3,159	–
1989	59	–							59	–	696	–	2,035	–	2,790	–
1990	–	–	0	8	0	0	52	0	52	8	784	0	2,700	0	3,536	8

–Continued–

Appendix Table 10. (p. 2 of 3).

District 5 Chinook Salmon Catch by Statistical Area

Year	334–51		334–52		334–53		334–54		334–55		334–54 & 55 Subtotal d		Total	
	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe
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	–			749	–	6,374	–
1982	61	–	2,352	–	2,277	–	695	–			695	–	5,385	–
1983	0	–	632	–	2,738	–	236	–			236	–	3,606	–
1984	128	–	1,589	–	1,568	–	384	–			384	–	3,669	–
1985	0	–	1,142	–	1,842	–	434	–			434	–	3,418	–
1986	0	–	1,552	–	875	–	306	–			306	–	2,733	–
1987	0	–	1,183	–	1,356	–	566	–			566	–	3,105	–
1988	0	–	1,498	–	1,477	–	461	–			461	–	3,436	–
1989	31	–	1,411	–	1,459	–	385	–			385	–	3,286	–
1990	0	0	1,630	47	1,180	0	194	0	349	0	543	0	3,353	47

–Continued–

Appendix Table 10. (p. 3 of 3).

District 6 Chinook Salmon Catch by Statistical Area

Year	334–61		334–62		334–63		Total	
	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe
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	–
1988	305	–	253	–	204	–	762	–
1989	809	–	614	–	318	–	1,741	–
1990	326	0	1,243	1,354	188	322	1,757	1,676

a Catches are in number of fish and pounds of roe. Roe sales not identified by species prior to 1990.
b Does not include 493 fish (summer chum salmon) erroneously keypunched as chinook salmon in final computer summary.
c In 1990, Statistical Area 334–41 was subdivided into Statistical Areas 334–44, 334–45 and 334–46.
d In 1990, Statistical Area 334–54 was subdivided into Statistical Areas 334–54 and 334–55.

Appendix Table 11. Commercial catches of chinook and summer chum salmon by mesh size, Districts 1 and 2, Lower Yukon Area, 1961–1990.

	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	19,474	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
1988	52,801	225,049	39,469	848,321
1989	53,674	126,360	38,548	765,233
1990	66,092	99,588	18,147	181,830
(Avg. 1986–90)	70,873	162,077	26,660	500,665

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, 1961–1990. 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
1988	32,792	20,009	52,801
1989	32,180	21,494	53,674
1990	42,092	24,000	66,092

Effort	District 1		District 2		Total	
Year	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
1988	14,280	2.30	7,884	2.54	22,164	2.38
1989	11,994	2.68	6,888	3.12	18,882	2.84
1990	16,347	2.57	8,319	2.88	24,666	2.68

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, 1974–1990.

	Period Catch a (Cumulative Catch) b									
Date	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
06/01										
06/02										
06/03										
06/04										
06/05	3.5 (3.5)					6.1 (6.1)				
06/06										
06/07								11.1 (11.1)		
06/08	7.5 (11.0)					4.9 (11.0)				
06/09					2.5 (2.5)			15.6 (26.7)		
06/10							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					5.8 (8.3)					
06/14		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			0.1 (0.1)			9.3 (39.8)		18.3 (59.5)		
06/17					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	18.8 (55.6)		3.2 (3.3)			16.7 (56.5)		28.5 (88.0)		
06/20					7.5 (33.4)					
06/21		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)	
06/23			9.6 (12.9)				4.5 (78.2)			
06/24					14.4 (47.8)					
06/25		17.1 (24.5)		26.3 (39.3)					7.1 (45.1)	
06/26	7.2 (65.7)		15.4 (28.3)							
06/27		9.8 (34.3)			5.4 (53.2)					
06/28				17.7 (57.0)						
06/29	3.8 (69.5)								18.1 (63.2)	
06/30			13.8 (42.1)							
07/01		7.3 (41.6)		8.7 (65.7)						
07/02			14.3 (56.4)						7.5 (70.7)	
07/03										
07/04										
07/05										
07/06										
07/07										
07/08										

– Continued –

Appendix Table 13. (page 2 of 2).

	Period Catch a (Cumulative Catch) b													
Date	1984		1985		1986		1987		1988		1989		1990	
06/01														
06/02														
06/03														
06/04														
06/05														
06/06														
06/07														
06/08														
06/09														
06/10														
06/11														
06/12														
06/13														
06/14									5.9	(5.9)				
06/15													19.0	(19.0)
06/16							13.0	(13.0)			18.9	(18.9)		
06/17									16.0	(21.9)				
06/18														
06/19	13.7	(13.7)					22.5	(35.5)						
06/20					21.7	(21.7)					10.8	(29.7)		
06/21									10.9	(32.8)				
06/22	18.8	(32.5)									2.5	(32.2)	15.0	(34.0)
06/23							15.0	(50.5)						
06/24					10.2	(31.9)								
06/25			23.6	(23.6)										
06/26	16.1	(48.6)					11.6	(62.1)						
06/27														
06/28			33.7	(57.3)										
06/29	16.5	(65.1)											6.5	(40.4)
06/30					5.6	(37.5)								
07/01														
07/02			18.8	(76.1)										
07/03													1.7	(42.1)
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, Lower Yukon Area, 1978–1990.

	Period Catch a (Cumulative Catch) b												
Date	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
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)					2.7 (2.7)		
06/17					4.0 (4.0)								
06/18		3.9 (26.2)		8.2 (37.7)						9.5 (9.5)			10.3 (10.3)
06/19	7.8 (20.1)											11.0 (11.0)	
06/20			8.1 (30.7)			10.6 (23.9)					9.0 (11.7)		
06/21		7.2 (33.4)			7.8 (11.8)		5.6 (5.6)						
06/22										12.2 (21.7)		7.5 (18.5)	
06/23	4.1 (24.2)		12.0 (42.7)			6.9 (30.8)			14.5 (14.5)		8.3 (20.0)		
06/24					11.9 (23.7)								7.7 (18.0)
06/25							14.4 (20.0)			10.9 (32.5)		3.0 (21.5)	
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)				4.5 (22.4)
07/03													
07/04								12.9 (38.2)					
07/05													1.6 (24.0)
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, 1974–1990. a

	Chinook Salmon					
	Lower Yukon Area		Upper Yukon Area			
Year	Districts 1 and 2	District 3	District 4	Subdist. 5–ABC	Subdist. 5–D	District 6
1974	–	3,480 (3,000)	685 (1,000)	2,663 (3,000) b		1,473 (1,000)
1975	–	4,177 (3,000)	389 (1,000)	2,872 (3,000) b		500 (1,000)
1976	–	4,148 (3,000)	409 (1,000)	3,151 (3,000) b		1,102 (1,000)
1977	–	3,965 (3,000)	985 (1,000)	4,162 (3,000) b		1,008 (1,000)
1978	–	2,916 (2,000)	608 (1,000)	3,079 (3,000) b		635 (1,000)
1979 b	–	5,018 (1,800–2,200)	1,989 (900–1,100)	3,389 (2,700–3,300) b		772 (900–1,100)
1980	–	5,240 (1,800–2,200)	1,521 (900–1,100)	4,891 (2,700–3,300) b		1,947 (900–1,100)
1981	145,287 (60,000–120,000)	4,023 (1,800–2,200)	1,347 (2,250–2,850)	5,625 (2,400–2,800)	749 (300–500)	987 (600–800)
1982	113,582 (60,000–120,000)	2,609 (1,800–2,200)	1,087 (2,250–2,850)	4,690 (2,400–2,800)	695 (300–500)	981 (600–800)
1983	138,686 (60,000–120,000)	4,106 (1,800–2,200)	601 (2,250–2,850)	3,370 (2,400–2,800)	236 (300–500)	911 (600–800)
1984	111,368 (60,000–120,000)	3,039 (1,800–2,200)	961 (2,250–2,850)	3,285 (2,400–2,800)	384 (300–500)	867 (600–800)
1985	138,376 (60,000–120,000)	2,588 (1,800–2,200)	664 (2,250–2,850)	2,984 (2,400–2,800)	434 (300–500)	1,142 (600–800)
1986	94,884 (60,000–120,000)	901 (1,800–2,200)	502 (2,250–2,850)	2,427 (2,400–2,800)	306 (300–500)	950 (600–800)
1987	124,101 (60,000–120,000)	2,039 (1,800–2,200)	1,524 (2,250–2,850)	2,539 (2,400–2,800)	566 (300–500)	1,202 (600–800)
1988	92,297 (60,000–120,000)	1,767 (1,800–2,200)	3,159 (2,250–2,850)	2,975 (2,400–2,800)	461 (300–500)	762 (600–800)
1989	92,378 (60,000–120,000)	1,645 (1,800–2,200)	2,790 (2,250–2,850)	2,901 (2,400–2,800)	385 (300–500)	1,741 (600–800)
1990	84,374 (60,000–120,000)	2,341 (1,800–2,200)	3,538 (2,250–2,850) c	2,822 (2,400–2,800) c	543 (300–500)	2,156 (600–800) c

–Continued–

Appendix Table 15. (p. 2 of 2)

Summer Chum Salmon

Year	Lower Yukon Area		Upper Yukon Area			
	Districts 1 and 2	District 3	Subdist. 4–A d	Subdist. 4–BC c	District 5	District 6 c
1990	281,418 (251,000–755,000)	643 (6,000–19,000)	197,641 (113,000–338,000)	13,420 (16,000–47,000)	671 (1000–3,000) b	14,788 (13,000–38,000)

Fall Chum and Coho Salmon

Year	Lower Yukon Area e	Upper Yukon Area f				
	Districts 1, 2, and 3	Subdist. 4–A	Subdist. 4–BC	Subdist. 5–ABC	Subdist. 5–D	District 6
1974	230,128 (200,000)	9,213 (10,000) g		24,960 (25,000) b		28,363 (15,000)
1975	215,439 (200,000)	13,666 (10,000) g		27,217 (25,000) b		18,745 (15,000)
1976	131,313 (200,000)	1,742 (10,000) g		5,387 (25,000) b		19,051 (15,000)
1977	199,603 (200,000)	13,980 (10,000) g		25,732 (25,000) b		19,957 (15,000)
1978	191,120 (200,000)		11,020 (10,000)	21,017 (25,000) b		16,325 (15,000)
1979 b	229,403 (120,000–220,000)		49,054 (10,000–40,000)	47,459 (10,000–40,000) b		36,976 (7,500–22,500)
1980	204,229 (120,000–220,000)		28,008 (10,000–40,000)	41,771 (10,000–40,000) b		20,678 (7,500–22,500)
1981	341,760 (120,000–220,000)		12,082 (10,000–40,000)	82,520 (8,000–36,000)	4,100 (2,000–4,000)	28,273 (5,500–20,500)
1982	199,880 (120,000–220,000)		3,909 (10,000–40,000)	13,593 (8,000–36,000)	0 (2,000–4,000)	14,600 (5,500–20,500)
1983	220,034 (120,000–220,000)		4,482 (10,000–40,000)	40,893 (8,000–36,000)	3,100 (2,000–4,000)	40,257 (5,500–20,500)
1984	155,983 (120,000–220,000)		8,720 (10,000–40,000)	21,160 (8,000–36,000)	2,900 (2,000–4,000)	28,252 (5,500–20,500)
1985	175,602 (120,000–220,000)		25,390 (10,000–40,000)	23,138 (8,000–36,000)	2,200 (2,000–4,000)	54,114 (5,500–20,500)
1986	113,452 (0–110,000)		2,045 (0–20,000)	20,710 (0–18,000)	1,343 (0–2,000)	2,333 (0–10,250)
1987	0 (0–110,000)		0 (0–20,000)	0 (0–18,000)	0 (0–2,000)	0 (0–10,250)
1988	79,480 (0–110,000)		15,664 (0–20,000)	14,225 (0–18,000)	2,772 (0–2,000)	35,816 (0–10,250)
1989	191,114 (0–110,000)		11,779 (0–20,000)	15,380 (0–18,000)	2,919 (0–2,000)	65,174 (0–10,250)
1990	68,225 (60,000–220,000)		8,166 (5,000–40,000) c	6,243 (4,000–36,000) c	2,733 (1,000–4,000) c	65,756 (2,750–20,500) c

a Quotas or guideline harvest range shown in parenthesis.
b Guideline harvest range for entire District 5.
c Includes estimated harvest of females to produce roe sold.
d Subdistrict 4–A harvest includes total estimated harvest including females and incidental males to produce roe sold.
e Chum salmon only; coho salmon catch not applied towards quotas or G.H.R.
f Chum and coho salmon combined (does not include estimatedharvest to produce roe sold, except as noted); mostly fall chum salmon.
g Guideline harvest range for entire District 4.

Appendix Table 16. Commercial chum salmon catches by statistical area, Lower Yukon Area, 1971–1990.

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
1988	82,625	155,531	81,873	61,171	68,444	17,144	139,464	87,475	693,727
1989	29,129	92,723	41,456	77,153	145,519	37,945	152,195	49,387	625,507
1990	23,453	35,542	15,326	12,369	10,931	1,513	39,575	10,202	148,911

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	29,986	33,069	44,294	266,880
1980	80,931	156,962	75,513	47,772	31,407	392,585
1981	76,143	215,346	86,040	78,216	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
1988	79,329	153,506	61,687	92,676	69,835	457,033
1989	58,229	174,839	63,987	73,571	71,242	441,868
1990	15,414	37,585	25,132	34,980	19,396	132,507

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
1988	13,211	2,844	16,055
1989	22,701	209	22,910
1990	562	81	643

Appendix Table 17. Commercial summer chum salmon sales by statistical area, Upper Yukon Area, 1974–1990. a,b

	District 4 Summer Chum Salmon Sales by Statistical Area															
	334–41		334–44		334–45		334–46		334–41,44,45 and 46 Subtotal e		334–42		334–43		Total	
Year	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe
1974	1,200	–							1,200	–	28,500	–	c	c	27,066	0
1975	105,600	–							105,600	–	59,500	–	c	c	165,054	0
1976	178,300	–							178,300	–	33,000	–	c	c	211,307	0
1977	148,700	–							148,700	–	20,800	–	c	c	169,541	0
1978	309,500	16,920							309,500	16,920	54,900	0	c	c	364,184	16,920
1979	136,300	35,117							136,300	35,117	29,200	200	3,900	0	169,430	35,317
1980	119,400	119,957							119,400	119,957	26,200	14,385	1,800	1,482	147,560	135,824
1981	46,000	160,757							46,000	160,757	11,800	23,677	1,900	2,598	59,718	187,032
1982	1,000	137,611							1,000	137,611	1,000	12,550	1,600	1,120	3,647	151,281
1983	3,400	130,013							3,400	130,013	3,300	17,549	0	563	6,672	148,125
1984	100	148,519							100	148,519	700	15,184	300	3,139	1,009	166,842
1985	5,100	222,149							5,100	222,149	1,800	19,306	5,100	5,630	12,007	247,085
1986	0	236,856							0	236,856	241	29,169	59	3,520	300	269,545
1987	29,314	110,977							29,314	110,977	593	9,956	84	541	29,991	121,474
1988	19,070	230,276							19,070	230,276	4,592	21,766	389	2,484	24,051	254,526
1989	14,397	270,039							14,397	270,039	2,940	9,915	1,217	3,351	18,554	283,305
1990			0	27,628	427	28,181	10,750	39,732	11,177	95,541	1,091	6,600	96	3,582	12,364	105,723

–Continued–

Appendix Table 17. (p. 2 of 3).

	District 5 Summer Chum Salmon Sales by Statistical Area													
	334–51		334–52		334–53		334–54		334–55		334–54 & 55 Subtotal f		Total	
Year	Numbers	Roe	Numbers	Roe	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			0	0	456	0
1981	1,100	0	100	49	0	0	0	0			0	0	1,236	49
1982	0	21	200	0	0	0	0	0			0	0	213	21
1983	0	242	0	269	0	1,345	0	0			0	0	42	1,856
1984	100	0	600	47	0	0	0	0			0	0	645	47
1985	0	0	700	0	0	0	0	0			0	0	700	0
1986	0	0	682	0	8	0	0	0			0	0	690	0
1987	0	0	362	44	0	0	0	0			0	0	362	44
1988	0	0	717	337	5	26	0	0			0	0	722	363
1989	0	0	112	204	1	169	41	0			41	0	154	373
1990	0	0	0	225	5	350	6	19	0	0	6	19	11	594

–Continued–

Appendix Table 17. (p. 3 of 3).

District 6 Summer Chum Salmon Sales by Statistical Area

Year	334–61		334–62		334–63		Total	
	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
1988	7,978	71	24,911	1,165	7,240	410	40,129	1,646
1989	16,483	61	18,960	4,277	6,672	533	42,115	4,871
1990	2,862	12	6,028	1,637	3,470	1,410	12,360	3,059

a Roe in pounds and may include small amounts of chinook salmon roe.
b Prior to 1986, the majority of summer chum salmon catches rounded to nearest 100.
c Combined with statistical area 334–42.
d Information not available.
e In 1990, Statistical Area 334–41 was subdivided into Statistical Area 334–44, 334–45 and 334–46.
f In 1990, Statistical Area 334–54 was subdivided into Statistical Area 334–54 and 334–55.

Appendix Table 18. Commercial fall chum salmon sales by statistical area, Upper Yukon Area, 1974–1990. a,b

	District 4 Fall Chum Salmon Catch by Statistical Area															
	334–41		334–44		334–45		334–46		334–41,44,45 and 46 Subtotal c,h		334–42		334–43		Total	
Year	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe
1974	–	–							–	–	9,213	–	d	d	9,213	–
1975	2,200	–							2,200	–	11,400	–	d	d	13,666	–
1976	400	–							400	–	1,300	–	d	d	1,742	–
1977	1,700	–							1,700	–	12,300	–	d	d	13,980	–
1978											11,000	1,721	d	d	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
1988											10,157	703	5,505	718	15,662	1,421
1989											9,819	2,023	1,957	1,384	11,776	3,407
1990											3,406	1,680	1,583	671	4,989	2,351

–Continued–

Appendix Table 18. (p. 2 of 3).

District 5 Fall Chum Salmon Catch by Statistical Area

Year	334–51		334–52		334–53		334–54		334–55		334–54 & 55 Subtotal e		Total	
	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe
1974	23,600	–	–	–	–	–	–	–			–	–	23,551	0
1975	27,212	–	–	–	–	–	–	–			–	–	27,212	0
1976	5,300	–	100	–	–	–	–	–			–	–	5,387	0
1977	25,600	–	0	–	–	–	–	–			–	–	25,730	0
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			0	0	41,771	605
1981	0	178	34,000	6,760	48,600	17	4,100	0			4,100	0	86,620	6,955
1982	8,300	0	1,100	23	4,300	19	0	0			0	0	13,593	42
1983	3,100	0	19,800	0	18,000	0	3,100	0			3,100	0	43,993	0
1984	1,400	0	10,300	0	9,400	0	2,900	57			2,900	57	24,060	57
1985	600	0	9,300	0	13,300	0	2,200	0			2,200	0	25,338	0
1986	1,332	0	11,907	395	7,471	0	1,343	0			1,343	0	22,053	395
1987 f	0	0	0	0	0	0	0	0			0	0	0	0
1988	0	0	9,684	0	4,533	0	2,772	0			2,772	0	16,989	0
1989	372	60	9,937	3,327	4,987	209	2,919	393			2,919	393	18,215	3,989
1990	0	0	5,169	945	0	0	1,758	113	851	0	2,609	113	7,778	1,058

–Continued–

Appendix Table 18. (p. 3 of 3).

District 6 Fall Chum Salmon Catch by Statistical Area

Year	334–61 Numbers	334–61 Roe	334–62 Numbers	334–62 Roe	334–63 Numbers	334–63 Roe	Total Numbers	Total 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	1,680	500	181	13,259	3,687
1979	7,100	g	21,600	g	5,500	g	34,185	7,170
1980	6,300	0	11,200	53	2,200	15	19,452	68
1981	4,900	0	18,900	2,784	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	3,009	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 f	0	0	0	0	0	0	0	0
1988	4,500	0	13,617	1,035	3,727	771	21,844	1,806
1989	14,870	173	25,650	7,050	8,570	130	49,090	7,353
1990	9,254	0	28,932	6,617	5,880	918	44,066	7,535

a Catches are in number of fish (including females sold with roe extracted and sold separately in Statistical Area 334–63 in 1990) and pounds of roe (may include small amounts of coho salmon roe).
b Prior to 1986, the majority of fall chum salmon catches rounded to nearest 100 fish.
c In 1990, Statistical Area 334–41 was subdivided into Statistical Areas 334–44, 334–45 and 334–46.
d Combined with Statistical Area 334–42.
e In 1990, Statistical Area 334–54 was subdivided into Statistical Areas 334–54 and 334–55.
f Does not include estimates of catches involving illegal salmon and salmon roe sales.
g Information not available.
h Since 1978, no commercial fall season has been allowed by regulation in Subdistrict 4–A.

Appendix Table 19. Commercial summer chum salmon catch and effort data, Districts 1 and 2, Lower Yukon Area, 1967–1990.

	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
1988	6/09–7/15	6.8	55,692	648,198	11.64	6/12–7/14	6.8	33,456	425,172	12.71
1989	6/13–7/14	5.3	65,280	547,631	8.39	6/15–7/13	4.5	22,314	343,962	15.41
1990	6/14–7/03	2.3	21,267	148,911	7.00	6/18–7/05	2.4	12,333	132,507	10.74

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, 1961–1990.

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						
1988 e	8/08–8/30	3	9,408	36,435	3.87	45,529	4.84
1989 f	7/27–8/25	5	20,161	24,672	1.22	77,876	3.86
1990 e	7/23–8/20	3	7,392	13,354	1.81	27,337	3.70

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.
e District was divided into a Set Net Only (12 hour) area and a Gill Net (6 hour) area.
f District was divided into a Set Net Only (16 or 12 hour) area and a Gill Net (9 or 6 hour) area.

Appendix Table 21. Fall chum salmon commercial catch data by period, District 1, Lower Yukon Area, 1978–1990.

	Period Catch (Cumulative Catch) a												
Date	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
07/18	6.3 (6.3)		4.2 (4.2)					6.3 (6.3)					
07/19						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			6.6 (10.8)										
07/23					27.8 (32.1)								
07/24		7.2 (13.2)		1.3 (7.3)									1.0 (1.0)
07/25	52.8 (64.2)		10.4 (21.2)										
07/26													
07/27		14.8 (28.0)			4.0 (36.1)								1.8 (2.8)
07/28	2.8 (67.0)			57.3 (64.6)								4.4 (4.4)	
07/29			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)						1.7 (4.5)
08/01	14.4 (81.4)											0.2 (4.5)	
08/02						18.5 (37.6)		2.2 (8.5)					
08/03		17.5 (55.2)					17.1 (35.4)						11.2 (15.7)
08/04	0.4 (81.8)				7.9 (55.7)							48.8 (53.3)	
08/05			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)						7.5 (23.2)
08/08	1.4 (83.2)								7.5 (18.9)			3.8 (57.2)	
08/09						44.0 (105.3)		35.8 (59.5)			32.5 (32.5)		
08/10		1.3 (94.3)			13.7 (70.6)								
08/11	1.6 (84.8)		5.2 (62.8)									2.5 (59.7)	
08/12					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)			14.9 (74.7)	
08/16													
08/17							10.1 (59.1)						
08/18	10.2 (96.4)			3.9 (135.5)									
08/19			42.2 (106.8)						5.8 (51.4)		0.5 (33.0)		
08/20													4.1 (27.3)
08/21													
08/22	21.9 (118.3)								8.0 (59.4)			2.9 (77.6)	
08/23											6.9 (39.9)		
08/24													
08/25	4.4 (122.7)											0.3 (77.9)	
08/26											4.1 (44.0)		
08/27													
08/28													
08/29	5.2 (127.9)												
08/30											1.5 (45.5)		

a Period and cumulative catches in thousands of fish. Fall chum salmon run usually well underway in the lower Yukon River by July 18. Season closures occurred in the following years:

1981: Season closed 8/01–8/12.
1983: Season closed 7/20–7/27.
1984: Season closed 7/18–8/01 and 8/08–8/12.
1985: Season closed 7/20–7/31.
1986: Season closed 7/16–8/03.
1987: Season closed.
1988: Season closed 7/16–8/07.
1989: Season closed 7/15–7/26.
1990: Season closed 7/04–7/22 and 8/08–8/19.

Appendix Table 22. Fall chum and coho salmon commercial catch and effort in the Set Net Only and Gill Net areas, District 1, Lower Yukon Area, 1983–1990.

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									
1988	120	21,971	183	208	23,558	113	328	45,529	139
1989	103	26,865	261	219	51,011	233	322	77,876	242
1990	83	7,553	91	218	19,784	91	301	27,337	91
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									
1988	120	13,408	112	208	23,027	111	328	36,435	111
1989	103	6,443	63	219	18,227	83	322	24,670	77
1990	83	2,033	24	218	11,321	52	301	13,354	44
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									
1988	120	35,379	295	208	46,585	224	328	81,964	250
1989	103	33,308	323	219	69,238	316	322	102,546	318
1990	83	9,586	115	218	31,105	143	301	40,691	135

a Season closed.

Appendix Table 23. Commercial salmon pack by species and type of processing, Yukon Area, 1960–1990. 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
1988 f				1,970,879	624,734	9,111,943		10		22 g	577,748
1989 f				2,005,949	585,216	8,864,714		6		16	303,298
1990 f				1,846,081	283,504	3,166,199		3			h 261,016

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.
f Does not include District 6 test fish sales.
g Additionally 1 half tierce of coho salmon was packed.
h A total of 1,368 pounds of chum salmon were packed.

Appendix Table 24. Dollar value estimates of Yukon Area commercial salmon fishery, 1961–1990.

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	–	2,151,000	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
1988 c	5,605,800	769,400	5,880,200	1,123,300	13,378,700	33,446,750	420,800
1989 c	5,289,900	357,300	3,194,700	1,338,200	10,180,100	25,450,250	332,000
1990	4,920,600	162,700	887,700	546,900	6,517,900	16,294,750	222,900
5 Year Avg. 1985–89	4,808,880	308,360	2,926,480	756,980	8,800,700	22,001,750	283,560

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.
c Does not include District 6 test fish sales.

Appendix Table 25. Estmated average prices paid to fishermen, Yukon Area, 1964–1990.

	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
1988	2.97	0.66	1.01	1.38	1.04	0.23	0.32	0.37	4.33
1989	2.77	0.34	0.50	0.66	0.84	0.24	0.28	0.35	4.41
1990	2.84	0.24	0.45	0.66	0.72	0.11	0.29	0.34	4.38

a Data unavailable.

Appendix Table 26. Average weight of salmon in pounds, commercial catch, Yukon Area, 1964–1990. 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		
1988	19.6	7.0	7.9	7.3	18.6	6.9	7.9	6.6
1989	19.9	7.2	7.5	7.3	17.9	6.8	7.4	6.0
1990	19.6	7.3	7.7	6.8	16.8	6.9	7.0	6.2

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

Appendix Table 27. Yukon River chinook salmon subsistence catches in numbers of fish by village, 1975–1990. a

Village	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Mouth to Anuk River												
Sheldon Pt.	91	427	163	79	1,021	802	143	592	1,173	302	165	756
Alakanuk	893	1,595	423	336	1,582	1,028	517	1,027	1,180	738	820	871
Emmonak	1,362	1,175	1,021	1,328	2,436	2,099	1,382	1,754	2,518	1,786	1,598	1,873
Kotlik	533	472	675	568	1,224	695	1,029	1,902	2,407	1,112	1,982	3,119
Subtotal	2,879	3,669	2,282	2,311	6,263	4,624	3,071	5,275	7,278	4,020 g	4,888 h	7,153 i
Anuk River to Owl Slough												
Mt. Village	1,025	843	811	218	1,875	1,217	672	1,367	2,252	740	2,001	1,792
Pitkas Pt.–St. Marys	1,718	1,297	1,380	985	2,432	2,663	778	1,717	2,457	1,378	2,184	2,476
Pilot Station	804	433	399	428	2,703	1,116	896	1,452	2,593	674	1,498	3,786
Marshall	721	1,101	990	478	2,055	2,176	1,122	1,947	2,564	1,031	1,464	1,492
Subtotal	4,268	3,674	3,580	2,109	9,065	7,172	3,468	6,483	9,866	3,823	7,147	9,546
Owl Slough to Bonasila R.												
Russian Mission	1,476	1,660	1,689	1,628	2,634	1,938	974	1,747	2,036	1,850	2,367	1,694
Holy Cross	1,787	3,123	2,312	1,731	2,276	2,456	2,368	2,505	2,625	2,593	2,379	2,337
Subtotal	3,263	4,783	4,001	3,359	4,910	4,394	3,342	4,252	4,661	4,443	4,746	4,031
Lower Yukon Total	10,410	12,126	9,863	7,779	20,238	16,190	9,881	16,010	21,805	12,286	16,781	20,730
Bonasila R. to Illinois Cr.												
Anvik	261	161	191	354	744	576	405	959	428	211	418	481
Grayling	391	3,664	222	294	951	879	903	1,837	1,322	1,571	1,082	144
Kaltag	435	694	179	344	652	487	669	1,080	1,117	1,168	1,306	2,244
Nulato	1,245	2,297	1,117	811	1,135	966	1,063	1,835	1,573	1,986	2,079	2,788
Koyukuk	495	699	541	493	966	1,009	194	569	609	711	1,003	876
Galena	1,591	1,205	570	735	1,477	1,226	1,329	1,046	1,270	1,982	1,374	3,134
Ruby–Kokrines	2,221	1,736	964	1,168	2,346	1,107	1,657	1,263	927	1,402	1,016	811
Subtotal	6,639	10,456	3,784	4,199	8,271	6,250	6,220	8,589	7,246	9,031	8,278	10,478
Illinois Cr. to U.S. Can. Border												
Tanana	1,604	5,711	2,517	2,230	5,547	2,682	1,248	1,672	4,021	3,537	3,008	2,284
Rampart	1,820	1,169	488	887	1,070	876	1,302	1,700	2,815	3,145	3,177	1,481
Stevens Village	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	4,889 c	5,312 c	3,828 c
Beaver	394	506	552	250	220	553	506	708	466	940	1,694	721
Ft. Yukon	1,922	2,527	2,794	1,894	1,887	3,608	2,900	3,083	3,950	2,245	4,898	4,051
Circle	1,175	769	728	969	648	545	2,259	2,233	1,814	2,034	1,785	2,201
Eagle	2,888	2,880	3,782	2,864	2,183	1,998	2,247	1,915	2,020	2,333	2,385	1,845
Subtotals	11,997	17,524	13,248	12,839	16,758	14,938	15,090	15,912	19,249	19,123	22,259	16,411

–Continued–

Appendix Table 27. (p. 2 of 2).

Village	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Shageluk												
Innoko River Subtotal	62	35	10	–	–	–	–	53	47	104	32	62
Koyukuk River												
Huslia	146	154	61	125	459	169	144	82	182	89	177	198
Hughes	180	226	402	479	318	856	778	296	177	29	181	90
Alatna	2	20	0	8	8	2	–	–	–	27	9	72
Allakaket	236	197	185	268	700	373	283 d	563 d	309 d	339	429	284
Subtotal	564	597	648	878	1,483	1,400	1,205	941	668	484	796	644
Tanana River												
Minto–Manley	269	764	711	797	1,265	722	2,130	971	414	1,038	1,358	1,758
Nenana	800	771	974	1,195	966	2,556	4,919	2,093	3,151	3,846	1,188	1,441
Fairbanks	264	291	400	451	475	321	326	637	531	557 g	500 h	560 i
Subtotal	1,333	1,826	2,085	2,443	2,706	3,599	7,375	3,701	4,096	5,441	3,046	3,759
Venetie												
Chandalar R. Subtotal	–	160	52	20	22	51	–	32	13	121	88	29
Upper Yukon Total	20,595	30,598	19,827	20,379	29,240	26,238	29,890	29,228	31,319	34,273	34,499	31,383
Alaska Total	31,005	42,724	29,690	28,158	49,478	42,428	39,771	45,238	53,124	46,559	51,280	52,113
Yukon Territory Villages												
Old Crow Porcupine R.	100	–	100	400	200	500	150	300	51	100	525	247
Dawson	1,200	–	1,016	20	–	–	–	–	–	–	–	–
Stewart River	–	–	1,000	62	–	–	–	–	–	–	–	–
Mayo–Stewart Crossing	–	–	–	720	–	–	–	–	–	–	–	–
Dunwash–Kluane River	–	–	–	0	–	–	–	–	–	–	–	–
Fort Selkirk	–	–	–	164	–	–	–	–	–	–	–	–
Pelly	–	–	–	3,142	–	–	–	–	–	–	–	–
Faro	–	–	3,286	–	–	–	–	–	–	–	–	–
Ross River	–	–	–	440	–	–	–	–	–	–	–	–
Minto	–	–	400	–	–	–	–	–	–	–	–	–
Carmacks	3,000	–	–	3,172	–	–	–	–	–	–	–	–
Lake Labarge–Whitehorse	–	–	3,042	7	–	–	–	–	–	–	–	–
Teslin–Johnson's Crossing	–	–	–	500	–	–	–	–	–	–	–	–
Subtotal e	4,200	13,046 f	9,216	8,268	5,625 f	6,610 f	6,428 f	9,267 f	6,500 f	7,560 f	8,155 f	7,903 f
Total	35,205	55,770	38,906	36,426	55,103	49,038	46,199	54,505	59,624	54,119	59,435	60,016

a 1961–1978 data available from 1981 Yukon Area Annual Management Report.

c Includes catches by Fairbanks subsistence and personal use permit holders that fished in Yukon River near bridge crossing.
d Alatna combined with Allakaket.
e Combined Indian Food Fish, Domestic and sport fish catch 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.
g Personal use catches included (Mouth to Anuk River – 82; Fairbanks – 557).
h Personal use catches included (Mouth to Anuk River – 323; Fairbanks – 495).
i Personal use catches included (Mouth to Anuk River – 534; Fairbanks – 560).

Appendix Table 28. Subsistence, commercial, and commercial related chinook salmon catches by district and country, Yukon River drainage, 1978–1990. a

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
District 1													
Subsistence	5,246	2,879	3,669	2,282	2,311	6,263	4,624	3,071	5,275	7,278	4,020	4,888	7,153
Commercial	59,006	75,007	90,382	99,506	74,450	95,457	74,671	90,011	53,035	76,643	57,109	59,153	51,161
Subtotal	64,252	77,886	94,051	101,788	76,761	101,720	79,295	93,082	58,310	83,921	61,129	64,041	58,314
District 2													
Subsistence	3,964	4,268	3,674	3,580	2,109	9,085	7,172	3,468	6,483	9,866	3,823	7,147	9,546
Commercial	32,924	41,498	50,004	45,781	39,132	43,229	36,697	48,365	41,849	47,458	35,188	33,225	33,213
Subtotal	36,888	45,766	53,678	49,361	41,241	52,294	43,869	51,833	48,332	57,324	39,011	40,372	42,759
District 3													
Subsistence	3,902	3,263	4,783	4,001	3,359	4,910	4,394	3,342	4,252	4,661	4,443	4,746	4,031
Commercial	2,916	5,018	5,240	4,023	2,609	4,106	3,039	2,588	901	2,039	1,767	1,645	2,341
Subtotal	6,818	8,281	10,023	8,024	5,968	9,016	7,433	5,930	5,153	6,700	6,210	6,391	6,372
Lower Yukon Total													
Subsistence	13,112	10,410	12,126	9,863	7,779	20,238	16,190	9,881	16,010	21,805	12,286	16,781	20,730
Commercial	94,846	121,523	145,626	149,310	116,191	142,792	114,407	140,964	95,785	126,140	94,064	94,023	86,715
Total	107,958	131,933	157,752	159,173	123,970	163,030	130,597	150,845	111,795	147,945	106,350	110,804	107,445
District 4													
Subsistence b	5,549	7,265	11,088	4,442	5,077	9,754	7,650	7,425	9,583	7,961	9,619	9,106	11,182
Commercial	608	1,989	1,521	1,347	1,087	601	961	664	502	1,524	3,159	2,790	3,536
Commercial Related	–	–	–	–	–	–	–	–	–	–	–	–	2
Subtotal	6,157	9,254	12,609	5,789	6,164	10,355	8,611	8,089	10,085	9,485	12,778	11,896	14,720
District 5													
Subsistence c	10,405	11,997	17,684	13,300	12,859	16,780	14,989	15,090	15,944	19,262	19,244	22,347	16,428
Commercial	3,079	3,389	4,891	6,374	5,385	3,606	3,669	3,418	2,733	3,758 d	3,436	3,286	3,353
Commercial Related	–	–	–	–	–	–	–	–	–	–	–	–	12
Subtotal	13,484	15,386	22,575	19,674	18,244	20,386	18,658	18,508	18,677	23,020	22,680	25,633	19,793
District 6													
Subsistence	1,231	1,333	1,826	2,085	2,443	2,706	3,599	7,375	3,701	4,096	5,441	3,046	3,360
Commercial	635	772	1,947	987	981	911	867	1,142	950	3,338 e	762	1,741	1,757
Commercial Related	–	–	–	–	–	–	–	–	–	–	–	–	399
ADF&G TF Sales	–	–	–	–	–	–	–	–	–	–	–	440	833
Subtotal	1,866	2,105	3,773	3,072	3,424	3,617	4,466	8,517	4,651	7,434	6,203	5,227	6,349
Upper Yukon Total													
Subsistence	17,185	20,595	30,598	19,827	20,379	29,240	26,238	29,890	29,228	31,319	34,304	34,499	30,970
Commercial	4,322	6,150	8,359	8,708	7,453	5,118	5,497	5,224	4,185	8,620	7,357	7,817	8,646
Commercial Related	–	–	–	–	–	–	–	–	–	–	–	–	413
ADF&G TF Sales	–	–	–	–	–	–	–	–	–	–	–	440	833
Total	21,507	26,745	38,957	28,535	27,832	34,358	31,735	35,114	33,413	39,939	41,661	42,756	40,862
Alaska Totals													
Subsistence	30,297	31,005	42,724	29,690	28,158	49,478	42,428	39,771	45,238	53,124	46,590	51,280	51,700
Commercial	99,168	127,673	153,985	158,018	123,644	147,910	119,904	146,188	99,970	134,760	101,421	101,840	95,361
Commercial Related	–	–	–	–	–	–	–	–	–	–	–	–	413
ADF&G TF Sales	–	–	–	–	–	–	–	–	–	–	–	440	833
Total	129,465	158,678	196,709	187,708	151,802	197,388	162,332	185,959	145,208	187,884	148,011	153,560	148,307
Canada													
Subsistence f	2,908	4,200	13,346	9,516	8,568	5,925	6,910	6,728	9,567	6,800	8,210	8,155	7,903
Commercial	2,975	6,175	9,500	8,593	8,640	13,027	9,885	12,573	10,797	10,864	13,217	9,789	11,324
Total	5,881	10,375	22,846	18,109	17,208	18,952	16,795	19,301	20,364	17,664	21,427	17,944	19,227
U.S./Canada Totals													
Subsistence f	33,203	35,205	55,770	38,906	36,426	55,103	49,038	46,199	54,505	59,624	54,119	59,435	59,603
Commercial	102,143	133,848	163,485	166,611	132,284	160,937	129,789	158,761	110,767	145,624	114,638	111,629	106,685
Commercial Related	–	–	–	–	–	–	–	–	–	–	–	–	413
ADF&G TF Sales	–	–	–	–	–	–	–	–	–	–	–	440	833
Totals	135,346	169,053	219,255	205,517	168,710	216,040	178,827	204,960	165,272	205,248	168,757	171,504	167,534

a Personal use catches combined with subsistence: does not include female salmon harvested to produce roe sales beginning in 1990. Commercial related refers to estimated harvest of female salmon to produce roe sold. This harvest is also believed to be reported as subsistence use in Table 14. ADF&G test fishery sales included in commercial harvest, except for District 6.
b Includes Innoko and Koyukuk River drainages.
c Includes Chandalar and Black River drainages.
d Includes illegal sales of 653 chinook salmon in Distict 5.
e Includes illegal sales of 2,136 chinook salmon in Distict 6.
f Combined Indian Food Fish, Domestic and Sport Fisheries harvest.

Appendix Table 29. Subsistence and commercial summer chum salmon catches by district, Yukon Area, 1978–1990. a

	1978	1979	1980	1981	1982	1983	1984	1985
District 1								
Subsistence	30,897	16,144	15,972	11,310	18,452	24,679	28,459	24,349
Commercial	393,785	369,934	391,252	507,158	249,516	451,164	292,676	247,486
Subtotal	424,682	386,078	407,224	518,468	267,968	475,843	321,135	271,835
District 2								
Subsistence	21,684	23,276	13,681	14,218	18,442	27,396	26,996	19,795
Commercial	227,548	172,838	308,704	351,878	182,344	248,092	236,931	188,099
Subtotal	249,232	196,114	322,385	366,096	200,786	275,488	263,927	207,894
District 3								
Subsistence	1,706	2,946	3,242	4,929	5,840	4,609	7,351	3,687
Commercial	27,003	40,015	44,782	54,471	4,086	14,600	1,087	1,792
Subtotal	28,709	42,961	48,024	59,400	9,926	19,209	8,438	5,479
Lower Yukon Total								
Subsistence	54,287	42,366	32,895	30,457	42,734	56,684	62,806	47,831
Commercial	648,336	582,787	744,738	913,507	435,946	713,856	530,694	437,377
Total	702,623	625,153	777,633	943,964	478,680	770,540	593,500	485,208
District 4								
Subsistence b	110,059	123,740	119,790	50,953	57,967	46,713	49,230	59,839
Commercial c	364,184	169,430	147,560	59,718	3,647	6,672	1,009	12,007
Commercial Related d	16,920	35,317	135,824	270,727	254,072	248,716	277,061	415,476
Subtotal	491,163	328,487	403,174	381,398	315,686	302,101	327,300	487,322
District 5								
Subsistence e	20,423	22,869	8,594	27,259	9,770	22,087	31,488	26,996
Commercial c	4,892	8,608	456	1,236	213	42	645	700
Commercial Related f	605	1,009	0	49	21	1,856	47	0
Subtotal	25,920	32,486	9,050	28,544	10,004	23,985	32,180	27,696
District 6								
Subsistence	3,534	2,312	6,426	8,960	6,942	23,696	23,106	23,078
Commercial c	34,814	18,491	35,855	32,477	21,597	24,309	56,249	66,913
Commercial Related f	8,236	3,891	3,282	1,987	1,517	18	335	1,540
ADF&G TF Sales	–	–	–	–	–	–	–	–
Subtotal	46,584	24,694	45,563	43,424	30,056	48,023	79,690	91,531
Total Upper Yukon								
Subsistence	134,016	148,921	134,810	87,172	74,679	92,496	103,824	109,913
Commercial c	403,890	196,529	183,871	93,431	25,457	31,023	57,903	79,620
Commercial Related	25,761	40,217	139,106	272,763	255,610	250,590	277,443	417,016
ADF&G TF Sales	–	–	–	–	–	–	–	–
Total	563,667	385,667	457,787	453,366	355,746	374,109	439,170	606,549
Alaska Total								
Subsistence	188,303	191,287	167,705	117,629	117,413	149,180	166,630	157,744
Commercial	1,052,226	779,316	928,609	1,006,938	461,403	744,879	588,597	516,997
Commercial Related	25,761	40,217	139,106	272,763	255,610	250,590	277,443	417,016
ADF&G TF Sales	–	–	–	–	–	–	–	–
Total	1,266,290	1,010,820	1,235,420	1,397,330	834,426	1,144,649	1,032,670	1,091,757

–Continued–

Appendix Table 29. (p. 2 of 2)

	1986	1987	1988	1989	1990
District 1					
Subsistence	38,854	30,760	29,439	53,275	37,294
Commercial	381,127	222,898	648,198	547,631	148,911
Subtotal	419,981	253,658	677,637	600,906	186,205
District 2					
Subsistence	41,496	33,134	28,787	39,703	28,453
Commercial	288,427	174,876	425,172	343,962	132,507
Subtotal	329,923	208,010	453,959	383,665	160,960
District 3					
Subsistence	5,528	4,161	5,830	3,982	3,003
Commercial	442	3,501	13,965	7,578	643
Subtotal	5,970	7,662	19,795	11,560	3,646
Lower Yukon Total					
Subsistence	85,878	68,055	64,056	96,960	68,750
Commercial	669,996	401,275	1,087,335	899,171	282,061
Total	755,874	469,330	1,151,391	996,131	350,811
District 4					
Subsistence b	59,730	56,926	95,384	49,777	33,052
Commercial c	300	29,991	24,051	18,554	12,364
Commercial Related d	465,235	179,809	466,023	491,690	198,697
Subtotal	525,265	266,726	585,458	560,021	244,113
District 5					
Subsistence e	21,833	24,806	33,073	12,924	10,598
Commercial c	690	362	722	154	11
Commercial Related f	0	44	363	373	660
Subtotal	22,523	25,212	34,158	13,451	11,269
District 6					
Subsistence	14,896	25,153	10,401	4,317	6,071
Commercial c	50,483	10,610	40,129	42,115	12,360 g
Commercial Related f	2,146	450	1,646	4,871	2,428
ADF&G TF Sales	–	–	–	6,267	5,325
Subtotal	67,525	36,213	52,176	57,570	26,184
Total Upper Yukon					
Subsistence	96,459	106,885	138,858	67,018	49,721
Commercial c	51,473	40,963	64,902	60,823	24,735
Commercial Related	467,381	180,303	468,032	496,934	201,785
ADF&G TF Sales	–	–	–	6,267	5,325
Total	615,313	328,151	671,792	631,042	281,566
Alaska Total					
Subsistence	182,337	174,940	202,914	163,978	118,471
Commercial	721,469	442,238	1,152,237	959,994	306,796
Commercial Related	467,381	180,303	468,032	496,934	201,785
ADF&G TF Sales	–	–	–	6,267	5,325
Total	1,371,187	797,481	1,823,183	1,627,173	632,377

a Personal use catches included with subsistence; does not include female salmon harvested to produce roe sold. ADF&G test fishery sales included in commercial harvest, except for District 6.
b Includes Koyukuk and Innoko River drainages.
c Includes only fish sold in the round.
d District 4 commercial related harvest includes estimated harvest of males and females to produce roe sold.
e Includes Chandalar and Black River drainages.
f Commercial related harvest in Districts 5 and 6 refers to the estimated harvest of female salmon to produce roe sold.
g Includes 1,278 female summer chum salmon sold with roe extracted and sold seperately.

Appendix Table 30. Subsistence and commercial fall chum salmon catches by district and country, Yukon River drainage, 1978–1990. a

	1978	1979	1980	1981	1982	1983	1984	1985
District 1								
Subsistence	390	15,788	7,433	15,540	10,016	8,238	8,885	13,275
Commercial	127,947	109,406	106,829	167,834	97,484	124,371	78,751	129,948
Subtotal	128,337	125,194	114,262	183,374	107,500	132,609	87,636	143,223
District 2								
Subsistence	1,297	14,662	12,435	11,770	9,511	10,341	11,394	11,544
Commercial	51,646	94,042	83,881	154,883	96,581	85,645	70,803	40,490
Subtotal	52,943	108,704	96,316	166,653	106,092	95,986	82,197	52,034
District 3								
Subsistence	266	2,443	2,320	2,893	1,659	2,863	2,233	2,290
Commercial	11,527	25,955	13,519	19,043	5,815	10,018	6,429	5,164
Subtotal	11,793	28,398	15,839	21,936	7,474	12,881	8,662	7,454
Lower Yukon Total								
Subsistence	1,953	32,893	22,188	30,203	21,186	21,442	22,512	27,109
Commercial	191,120	229,403	204,229	341,760	199,880	220,034	155,983	175,602
Total	193,073	262,296	226,417	371,963	221,066	241,476	178,495	202,711
District 4								
Subsistence b	8,931	34,697	19,328	18,812	20,152	32,246	28,937	22,750
Commercial d	10,988	48,899	27,978	12,082	3,894	4,482	7,625	24,452
Commercial Related	1,721	3,199	4,347	1,311	167	1,963	2,215	2,525
Subtotal	21,640	86,795	51,653	32,205	24,213	38,691	38,777	49,727
District 5								
Subsistence c	46,485	102,695	75,861	104,612	71,786	105,103	98,376	117,125
Commercial d	21,016	47,459	41,771	86,620	13,593	43,993	24,060	25,338
Commercial Related	5,220	8,097	605	6,955	42	0	57	0
Subtotal	72,721	158,251	118,237	198,187	85,421	149,096	122,493	142,463
District 6								
Subsistence	26,870	44,596	50,260	23,613	18,968	29,073	22,670	36,963
Commercial d	13,259	34,185	19,452	25,989	6,820	34,089	20,564	42,352
Commercial Related	3,687	7,170	68	3,019	596	3,101	56	0
ADF&G TF Sales	0	0	0	0	0	0	0	0
Subtotal	43,816	85,951	69,780	52,621	26,384	66,263	43,290	79,315
Upper Yukon Total								
Subsistence	82,286	181,988	145,449	147,037	110,906	166,422	149,983	176,838
Commercial	45,263	130,543	89,201	124,691	24,307	82,564	52,249	92,142
Commercial Related	10,628	18,466	5,020	11,285	805	5,064	2,328	2,525
ADF&G TF Sales	0	0	0	0	0	0	0	0
Total	138,177	330,997	239,670	283,013	136,018	254,050	204,560	271,505
Alaska Totals								
Subsistence	84,239	214,881	167,637	177,240	132,092	187,864	172,495	203,947
Commercial	236,383	359,946	293,430	466,451	224,187	302,598	208,232	267,744
Commercial Related	10,628	18,466	5,020	11,285	805	5,064	2,328	2,525
ADF&G TF Sales	0	0	0	0	0	0	0	0
Total	331,250	593,293	466,087	654,976	357,084	495,526	383,055	474,216
Canada Totals								
Subsistence g	6,210	13,000	13,218	7,021	4,779	3,500	6,335	5,519
Commercial	3,356	9,084	9,000	15,260	11,312	25,990	22,932	35,746
Total	9,566	22,084	22,218	22,281	16,091	29,490	29,267	41,265
Yukon River drainage Totals								
Subsistence	90,449	227,881	180,855	184,261	136,871	191,364	178,830	209,466
Commercial	239,739	369,030	302,430	481,711	235,499	328,588	231,164	303,490
Commercial Related	10,628	18,466	5,020	11,285	805	5,064	2,328	2,525
ADF&G TF Sales	0	0	0	0	0	0	0	0
Total	340,816	615,377	488,305	677,257	373,175	525,016	412,322	515,481

–Continued–

Appendix Table 30. (p.2 of 2)

	1986	1987	1988	1989	1990
District 1					
Subsistence	9,000	18,467	5,482	4,934	5,395
Commercial	59,352	0	45,529	77,876	27,337
Subtotal	68,352	18,467	51,011	82,810	32,732
District 2					
Subsistence	13,483	13,454	8,600	10,015	6,187
Commercial	51,307	0	31,861	97,906	37,173
Subtotal	64,790	13,454	40,461	107,921	43,360
District 3					
Subsistence	1,785	2,853	1,747	1,019	2,056
Commercial	2,793	0	2,090	15,332	3,715
Subtotal	4,578	2,853	3,837	16,351	5,771
Lower Yukon Total					
Subsistence	24,268	34,774	15,829	15,968	13,638
Commercial	113,452	0	79,480	191,114	68,225
Total	137,720	34,774	95,309	207,082	81,863
District 4					
Subsistence b	26,496	41,901	16,958	21,137	16,064
Commercial d	2,045	0	15,662	11,776	4,989
Commercial Related	0	0	1,421	3,407	3,177
Subtotal	28,541	41,901	34,041	36,320	24,230
District 5					
Subsistence c	87,729	157,085 e	86,862	111,541	94,243
Commercial d	22,053	0	16,989	18,215	7,778
Commercial Related	395	0	0	3,989	1,198
Subtotal	110,177	157,085	103,851	133,745	103,219
District 6					
Subsistence	24,973	127,903 f	36,827	53,298	46,805
Commercial d	1,892	0	21,844	49,090	44,066 h
Commercial Related	182	0	1,806	7,353	6,908
ADF&G TF Sales	0	0	26,988	16,984	7,060
Subtotal	27,047	127,903	87,465	126,725	104,839
Upper Yukon Total					
Subsistence	139,198	326,889	140,647	185,976	157,112
Commercial	25,990	0	54,495	79,081	56,833
Commercial Related	577	0	3,227	14,749	11,283
ADF&G TF Sales	0	0	26,988	16,984	7,060
Total	165,765	326,889	225,357	296,790	232,288
Alaska Totals					
Subsistence	163,466	361,663	156,476	201,944	170,750
Commercial	139,442	0	133,975	270,195	125,058
Commercial Related	577	0	3,227	14,749	11,283
ADF&G TF Sales	0	0	26,988	16,984	7,060
Total	303,485	361,663	320,666	503,872	314,151
Canada Totals					
Subsistence g	3,029	3,889	3,302	5,471	6,085
Commercial	11,464	40,591	30,263	17,549	27,537
Total	14,493	44,480	33,565	23,020	33,622
Yukon River drainage Totals					
Subsistence	166,495	365,552	159,778	207,415	176,835
Commercial	150,906	40,591	164,238	287,744	152,595
Commercial Related	577	0	3,227	14,749	11,283
ADF&G TF Sales	0	0	26,988	16,984	7,060
Total	317,978	406,143	354,231	526,892	347,773

a Personal use catches included with subsistence; does not include female salmon harvested to produce roe sales. Commercial related refers to estimated harvest of female salmon to produce roe sold. This harvest is also believed to be reported as subsistence use in Table 14. ADF&G test fishery sales included in commercial harvest, except for District 6.

b Includes Innoko and Koyukuk River drainages.

c Includes Chandalar and Black River drainages.

d Includes only fish sold in the round.

e Includes illegal sales involving an estimated 95,768 fall chum salmon.

f Includes illegal sales involving an estimated 119,168 fall chum salmon.

g Combined Indian Food Fish and Domestic Fisheries harvests.

h Includes 884 female fall chum salmon sold with roe extracted and sold seperately.

Appendix Table 31. Subsistence and commercial coho salmon catches by district, Yukon Area, 1978–1990. a

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
District 1													
Subsistence	1,142	3,184	1,808	3,769	11,192	3,590	6,095	3,246	2,725	6,396	4,389	5,144	3,309
Commercial	16,460	11,369	4,829	13,129	15,115	4,595	29,472	27,676	24,824	0	36,435	24,672	13,354
Subtotal	17,602	14,553	6,637	16,898	26,307	8,185	35,567	30,922	27,549	6,396	40,824	29,816	16,663
District 2													
Subsistence	598	1,132	4,801	3,736	10,229	6,072	7,066	4,834	9,140	6,894	7,104	5,039	6,344
Commercial	5,835	2,850	2,660	7,848	14,179	2,557	43,064	17,125	21,197	0	34,776	38,522	16,435
Subtotal	6,433	3,982	7,461	11,584	24,408	8,629	50,130	21,959	30,337	6,894	41,880	43,561	22,779
District 3													
Subsistence	223	12	91	490	675	917	740	376	781	682	1,539	537	1,026
Commercial	758	0	0	419	87	0	621	171	793	0	1,419	3,988	918
Subtotal	981	12	91	909	762	917	1,361	547	1,574	682	2,958	4,525	1,944
Lower Yukon Total													
Subsistence	1,963	4,328	6,700	7,995	22,096	10,579	13,901	8,456	12,646	13,972	13,032	10,720	10,679
Commercial	23,053	14,219	7,489	21,396	29,381	7,152	73,157	44,972	46,814	0	72,630	67,182	30,707
Total	25,016	18,547	14,189	29,391	51,477	17,731	87,058	53,428	59,460	13,972	85,662	77,902	41,386
District 4													
Subsistence b	145	259	7,734	2,259	2,952	3,948	2,867	3,949	2,631	3,551	4,842	4,030	3,614
Commercial	32	155	30	0	15	0	1,095	938	0	0	2	3	0
Subtotal	177	414	7,764	2,259	2,967	3,948	3,962	4,887	2,631	3,551	4,844	4,033	3,614
District 5													
Subsistence c	970	595	561	1,713	3,428	2,448	17,467	8,098	5,870	11,900 d	19,755	7,110	11,166
Commercial	1	0	0	0	0	0	0	0	0	0	8	84	0
Subtotal	971	595	561	1,713	3,428	2,448	17,467	8,098	5,870	11,900	19,763	7,194	11,166
District 6													
Subsistence	4,709	4,612	5,163	9,261	7,418	6,922	14,785	11,761	13,321	55,471 e	31,509	19,650	19,562
Commercial	3,066	2,791	1,226	2,284	7,780	6,168	7,688	11,762	441	0	13,972	16,084	11,987 f
Commercial Related	–	–	–	–	–	–	–	–	–	–	–	–	2,795
ADF&G TF Sales	–	–	–	–	–	–	–	–	–	–	13,295	2,140	1,426
Subtotal	7,775	7,403	6,389	11,545	15,198	13,090	22,473	23,523	13,762	55,471	58,776	37,874	35,770
Upper Yukon Total													
Subsistence	5,824	5,466	13,456	13,233	13,796	13,316	35,119	23,808	21,822	70,922	56,106	30,790	34,342
Commercial	3,099	2,946	1,256	2,284	7,795	6,168	8,783	12,700	441	0	13,982	16,171	11,987
Commercial Related	–	–	–	–	–	–	–	–	–	–	–	–	2,795
ADF&G TF Sales	–	–	–	–	–	–	–	–	–	–	13,295	2,140	1,426
Total	8,923	8,412	14,714	15,517	21,593	19,484	43,902	36,508	22,263	70,922	83,383	49,101	50,550
Area Total													
Subsistence	7,787	9,794	20,158	21,228	35,894	23,895	49,020	32,284	34,468	84,894	69,138	41,510	45,021
Commercial	28,152	17,165	8,745	23,680	37,176	13,320	81,940	57,672	47,255	0	86,612	83,353	42,694
Commercial Related	–	–	–	–	–	–	–	–	–	–	–	–	2,795
ADF&G TF Sales	–	–	–	–	–	–	–	–	–	–	13,295	2,140	1,426
Total	33,939	26,959	28,903	44,908	73,070	37,215	130,960	89,936	81,723	84,894	169,045	127,003	91,936

a Personal use catches combined with subsistence; does not include female salmon harvested to produce roe sales beginning in 1990. Commercial related refers to estimated harvest of female salmon to produce roe sold. This harvest is also believed to be reported as subsistence use in Table 14. ADF&G test fishery sales included in commercial harvest, except for District 6.

b Includes Innoko and Koyukuk River drainages.

c Includes Chandalar and Black River drainages.

d Includes illegal sales involving an estimated 11,840 coho salmon.

e Includes illegal sales involving an estimated 52,335 coho salmon.

f Includes 438 female coho salmon sold with roe extracted and sold seperately.

Appendix Table 32. Subsistence and personal use salmon catches taken under authority of a permit, Upper Yukon Area, 1973–1990.

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

Year	No. of Permits Issued	No. Reporting Catches a	Chinook	Summer Chum	Fall Chum and coho
1973	22	4	26	771	886
1974	70	b	38	1,373	1,580
1975	36	b	32	751	864
1976	110	b	31	1,314	1,512
1977	89	33	81	118	607
1978	160	126	126	2,729	1,188
1979	248	199	264	2,384	4,459
1980	315	254	282	3,729	4,059
1981	348	228	440	3,239	5,770
1982	330	209	451	2,708	4,521
1983	258	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 c	289	183	531	2,739	5,781
1988 d	210	114	557	1,715	3,538
1989 d	177	160	439	1,098	2,767
1990 e	153	110	466	966	2,609

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	b	1,974
1975	26	b	2,573
1976	36	b	3,441
1977	48	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 c	20	11	1,651
1988 d	22	19	2,150
1989 d	12	12	1,785
1990 e	7	3	750

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

Year	No. of Permits Issued	No. Reporting Catches a	Chinook	Chum	Coho
1974	29	b	591	1,857	1,271
1975	19	b	727	778	70
1976	28	18	531	974	–
1977	38	b	467	2,567	–
1978	57	b	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 c	58	47	3,492	29,734	64
1988 d	58	39	2,044	3,980	0
1989 e	71	62	3,494	6,576	397
1990 e	64	45	3,773	9,522	491

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

Year	No. of Permits Issued	No. Reporting Catches a	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
1988	39	33	2,333	16,073	11
1989	59	56	1,180	7,490	1
1990 e	85	63	4,210	17,965	224

a Some fishermen reporting catches did not have permits.
b Information not available.
c Personal use fishery established only for fall chum salmon in 1987.
d Personal use catches (fishery established for all salmon in 1988).
e Personal use and subsistence catch information.

Appendix Table 33. Chinook salmon escapement counts for selected U.S. spawning stocks in the Yukon River drainage, 1961–1990. [a]

Year	Andreafsky River		Anvik River[b]		Nulato River	Gisasa River	Chena River			Salcha River		
	East Fork	West Fork	Aerial	Tower			Population [c]	River	Index	Population [c]	River	Index
1961	1,003	–	1,226	–	543 [e]	266 [e]	–	–	–	–	2,878	–
1962	675 [e]	762 [e]	–	–	–	–	–	61 [e,d]	–	–	937	–
1963	–	–	–	–	–	–	–	137 [e]	–	–	–	–
1964	867	705	–	–	–	–	–	–	–	–	450	–
1965	–	344 [e]	650 [e]	–	–	–	–	–	–	–	408	–
1966	361	303	638	–	–	–	–	–	–	–	800	–
1967	–	276 [e]	336 [e]	–	–	–	–	–	–	–	–	–
1968	380	383	310 [e]	–	–	–	–	–	–	–	739	–
1969	274 [e]	231 [e]	296 [e]	–	–	–	–	–	–	–	461 [e]	–
1970	665	574 [e]	368	–	–	–	–	6 [e]	–	–	1,882	–
1971	1,904	1,682	–	–	–	–	–	193 [e,d]	–	–	158 [e]	–
1972	798	582 [e]	–	1,198	–	–	–	138 [e,d]	–	–	1,193	1,034
1973	825	788	–	613	–	–	–	21 [e]	–	–	391	–
1974	–	285	–	471 [e]	78 [e]	161	–	1,016 [d]	959	–	1,857	1,620
1975	993	301	–	730	204	385	–	316 [d]	262	–	1,055	–
1976	818	643	–	1,153	648	332	–	531	496	–	1,641	1,473
1977	2,008	1,499	–	1,371	487 [e]	255	–	563	–	–	1,202	1,052
1978	2,487	1,062	–	1,324	920	45 [e]	–	1,726	–	–	3,499	3,258
1979	1,180	1,134	–	1,484	1,507	484	–	1,159 [e]	–	–	4,789	–
1980	958 [e]	1,500	1,192	–	1,323 [e]	951	–	2,541	–	–	6,757	6,126
1981	2,146 [e]	231 [e]	577 [e]	–	791 [e]	–	–	600 [e]	–	–	1,237 [e]	1,121 [e]
1982	1,274	851	–	–	–	421	–	2,073	–	–	2,534	2,346
1983	–	–	376 [e]	–	1,006	572	–	2,553	2,336	–	1,961	1,803
1984	1,573 [e]	1,993	574 [e]	–	–	–	–	501	494	–	1,031	906
1985	1,617	2,248	720	–	2,780	735	–	2,553	2,262	–	2,035	1,860
1986	1,954	3,158	918	–	2,974	1,346	9,065	2,031	1,935	–	3,368	–
1987	1,608	3,281	879	–	1,638	731	6,404	1,312	1,209	4,771	1,898	1,671
1988	1,020	1,448	1,449	–	1,775	797	3,346	1,966	1,760	4,562	2,761	2,553
1989	1,399	1,089	212 [e]	–	–	–	2,666	1,280	1,185	3,294	2,333	2,136
1990	2,503	1,545	1,595	–	998	884 [e]	5,603	1,436	1,402	10,728	3,744	3,429
E.O.[f]	1,600	1,000	500 [g]	–	1,000	650	–	–	1,700 [h]	–	–	2,500 [i]

[a] Data obtained by aerial survey unless otherwise noted. Only peak counts are listed.
[b] From 1961–1970, aerial survey count data are from various segments of the mainstem Anvik River. From 1971–1979, mainstem aerial survey counts below the tower were added to tower counts. From 1980–present, aerial survey counts are from the mainstem Anvik River between the Yellow River and McDonald Creek.
[c] Incomplete and/or poor survey conditions resulting in minimal or inaccurate counts.
[d] Boat survey.
[e] Population point estimate based on a Division of Sport Fish tagging mark–and–recovery project.
[f] Interim escapement objective.
[g] Interim escapement objective for the mainstem Anvik River between the Yellow River and McDonald Creek.
[h] Interim escapement objective for the mainstem Chena River between Moose Creek Dam and the Middle Fork River.
[i] Interim escapement objective for the mainstem Salcha River between TAPS and Caribou Creek.

Appendix Table 34. Chinook salmon escapement counts for selected Canadian spawning stocks in the Yukon River drainage, 1961–1990.[a]

Year	Tincup Creek	Tatchun River[b]	Little Salmon River	Big Salmon River[d]	Nisutlin River[e]	Wolf River[f]	Whitehorse Fishway[g]	Canada Mainstem Tagging Estimate[h]
1961	–	–	–	–	–	–	1,068	–
1962	–	–	–	–	–	–	1,500	–
1963	–	–	–	–	–	–	483	–
1964	–	–	–	–	–	–	595	–
1965	–	–	–	–	–	–	903	–
1966	–	7[c]	–	–	–	–	563	–
1967	–	–	–	–	–	–	533	–
1968	–	–	173[c]	857[c]	407[c]	–	414	–
1969	–	–	120	286	105	–	334	–
1970	–	100	–	670	615	71[c]	625	–
1971	–	130	275	275	650	750	856	–
1972	–	80	126	415	237	13	391	–
1973	100	99	27[c]	75[c]	36[c]	–	224	–
1974	–	192	–	70[c]	48[c]	–	273	–
1975	–	175	–	153[c]	249	40[c]	313	–
1976	–	52	–	86[c]	102	–	121	–
1977	–	150	408	316[c]	77	–	277	–
1978	–	200	330	524	375	–	725	–
1979	–	150	489[c]	632	713	183[c]	1,184	–
1980	–	222	286[c]	1,436	975	377	1,383	–
1981	–	133	670	2,411	1,626	395	1,555	–
1982	–	73	403	758	578	104	473	19,790
1983	100	264	101[c]	540	701	95	905	28,989
1984	150	161	434	1,044	832	124	1,042	27,616[i]
1985	210	190	255	801	409	110	508	10,730
1986	228	155	54[c]	745	459[c]	109	557	16,415
1987	100	159	468	891	183	35	327	13,210
1988	204	130	368	765	267	66	405	23,118
1989	88	100	862	1,662	695	146	549	25,201
1990	83	643	665	1,806	652	188	1,407	37,699
E.O.[m]								33,000–43,000

[a] Data obtained by aerial survey unless otherwise noted. Only peak counts are listed.
[b] All foot surveys except 1978 (boat survey) and 1986 (aerial survey).
[c] Incomplete and/or poor survey conditions resulting in minimal or inaccurate counts.
[d] For 1968, 1970, and 1971 counts are from mainstem Big Salmon River. For all other years counts are from the mainstem Big Salmon River between Big Salmon Lake and the vicinity of Souch Creek.
[e] One Hundred Mile Creek to Sidney Creek.
[f] Wolf Lake to Red River.
[g] Includes 50, 90, 292, and 506 fin–clipped hatchery–origin salmon in 1988, 1989, 1990, and 1991 respectively.
[h] Estimated total spawning escapement excluding Porcupine River (estimated border escapement minus the Canadian catch.
[i] Estimate derived by dividing the 1984 5–area (Whitehorse Fishway, Big Salmon, Nisutlin, Wolf, Tatchun) count by the average proportion of the 5–area index count to the estimated spawning escapements from the DFO tagging study for years 1982, 1983, and 1985–1990.
[m] Interim escapement objective.

Appendix Table 35. Summer chum salmon escapement counts for selected spawning areas in the Yukon River drainage, 1973–1990. [a]

Year	Andreafsky River			Anvik River		Nulato River	Hogatza River[e]	Salcha River	Rodo River	Gisasa River
	East Fork									
	Aerial	Sonar or Tower	West Fork	Tower & Aerial	Sonar					
1973	10,149 [b]	–	51,835	86,665 [b]	–	–	–	–	–	–
1974	3,215 [b]	–	33,578	201,277	–	51,160	–	3,510	16,137	22,022
1975	223,485	–	235,954	845,485	–	138,495	22,355	7,573	25,335	56,904
1976	105,347	–	118,420	406,166	–	48,920	20,744	6,474	38,258	21,342
1977	112,722	–	63,120	262,854	–	69,660	10,734	677 [b]	16,118	2,204 [b]
1978	127,050	–	57,321	251,339	–	54,480	5,102	5,405	17,845	9,280 [b]
1979	66,471	–	43,391	–	280,537	37,104	14,221	3,060	–	10,962
1980	36,823 [b]	–	114,759	–	492,676	14,946 [b]	19,786	4,140	–	10,388
1981	81,555	147,312 [c]	–	–	1,486,182	14,348 [b]	–	8,500	–	–
1982	7,501 [b]	181,352 [c]	7,267 [b]	–	444,581	–	4,984 [b]	3,756	–	334 [b]
1983	–	110,608 [c]	–	–	362,912	20,830	28,141	716 [b]	–	2,356 [b]
1984	95,200 [b]	70,125 [c]	238,565	–	891,028	–	–	9,810	–	–
1985	66,146	–	52,750	–	1,080,243	29,838	22,566	3,178	24,576	13,232
1986	83,931	167,614 [d]	99,373	–	1,189,602	64,265	–	8,028	–	12,114
1987	6,687 [b]	45,221 [d]	35,535	–	455,876	11,257	5,669 [b]	3,657	–	2,123
1988	43,056	68,937 [d]	45,432	–	1,125,449	42,083	6,890	2,889 [b]	13,872	9,284
1989	21,460 [b]	–	–	–	636,906	–	–	1,574 [b]	–	–
1990	11,519 [b]	–	20,426 [b]	–	403,627	4,615 [b]	2,177 [b]	450 [b]	1,941 [b]	450 [b]
E.O.[f]	109,000		116,000		487,000	53,000	17,000	3,500		
Avg.[h]	101,085		91,541		737,468	51,645	16,727	5,591	21,734	17,597

[a] Data obtained by aerial survey unless otherwise noted. Only peak counts are listed.
[b] Incomplete survey and/or poor survey timing or conditions resulted in minimal or inaccurate count.
[c] Sonar count.
[d] Tower count.
[e] Includes Caribou and Clear Creeks with escapement objectives of 8,000 and 9,000, respectively.
[f] Interim escapement objective.
[h] Average of surveys rated as least fair from 1973–1990.

Appendix Table 36. Fall chum salmon escapement counts for selected spawning areas in the Yukon River drainage, 1974–1990.

Year	Upper Toklat River[a]	Delta River[b]	Chandalar River[c]	Sheenjek River[c]	Fishing Branch River[e]	Canada Mainstem Tagging Estimate[f]
1974	43,484	5,915	–	89,966 [d]	32,525 [g]	–
1975	90,984	3,734 [h]	–	173,371 [d]	353,282 [g]	–
1976	53,882	6,312 [h]	–	26,354 [d]	36,584	–
1977	36,462	16,876 [h]	–	45,544 [d]	88,400	–
1978	37,057	11,136	–	32,449 [d]	40,800	–
1979	179,627	8,355	–	91,372 [d]	119,898	–
1980	26,373	5,137	–	28,933 [d]	55,268	–
1981	15,775	23,508	–	74,560 [d]	57,386 [i]	–
1982	3,601	4,235	–	31,421	15,901	31,958
1983	20,807	7,705	–	49,392	27,200	90,875
1984	16,511	12,411	–	27,130	15,150	56,633 [j]
1985	22,805	17,276 [h]	–	152,768	56,100 [g]	62,010
1986	18,903	6,703 [h]	59,313	83,197	31,173 [g]	87,990
1987	22,141	21,180	52,416	140,086	48,956 [g]	80,776
1988	13,324	18,024	33,619	41,073	23,597 [g]	36,786
1989	30,447	21,342 [h]	69,161	101,748 [m]	43,834 [g]	35,750
1990	33,672	8,992 [h]	78,631	65,721	27,000 [n]	51,735
E.O.[p]	33,000	11,000	–	64,000	50,000 – 120,000	80,000

[a] Total escapement estimates using Delta River migratory time density curve and percentage of live salmon present by survey date in upper Toklat River area.
[b] Total escapement estimates made from migratory time density curve (see Barton 1986), unless otherwise indicated.
[c] Sonar estimate.
[d] Total escapement estimates using sonar to aerial survey expansion facor of 2.221, unless otherwise indicated.
[e] Total escapement estimates using weir to aerial survey expansion factor of 2.72, unless otherwise indicated.
[f] Excludes Fishing Branch River escapment (estimated border passage minus Canadian removal).
[g] Weir estimate.
[h] Population estimate from replicate foot surveys and stream life data.
[i] Initial aerial survey count was doubled before applying the weir/aerial expansion factor of 2.72 since only half of the spawning area was surveyed.
[j] Escapement estimate based on mark–recapture program unavailable. Estimate based on assumed average exploitation rate.
[m] Includes a passage estimate of 20,000 salmon prior to initation of sonar monitoring operations.
[n] Weir was not operated. Total escapement estimate using weir to aerial survey expansion factor of 3.57. Survey was conducted approximately 2 weeks late. Therefore, a more reasonable escapement would be between 30,000 and 40,000 salmon
[p] Interim escapement objective.

Appendix Table 37. Coho salmon escapement for selected spawning areas in the Yukon River drainage, 1972–1990.[a]

Year	Nenana River Drainage				Delta Clearwater River[c,d]	Clearwater Lake and Outlet	Richardson Clearwater River
	Slough	Creek	Wood Creek[b]	17–Mile Slough			
1972	–	–	–	–	630	417	454 [e]
1973	–	–	–	–	3,322	551 [c]	375 [c]
1974	1,388	–	–	27	3,954	560	652 [c]
1975	943	–	–	956	5,100	1,575 [c,d]	4 [e]
1976	118	13	–	281	1,920	1,500 [c,d]	80 [e]
1977	524	–	310 [f]	1,167	4,793	730 [c,d]	327
1978	350	–	300 [f]	466	4,798	570 [c,d]	–
1979	227	–	–	1,987	8,970	1,015 [c,d]	372
1980	499	–	1,603 [f]	592	3,946	1,545 [c,d]	611
1981	274	–	849 [g]	1,005	8,563 [h]	459 [e]	550
1982	–	–	1,436 [g]	–	8,365 [h]	–	–
1983	766	–	1,044 [g]	103	8,019 [h]	253	88
1984	2,677	2,600 [b,d]	8,805 [g]	–	11,061	1,368	428
1985	1,584	–	3,775 [g]	2,081	6,842 [e]	750	–
1986	794	605 [b,d]	1,664 [g]	218 [b,d]	10,857	3,577	146 [e]
1987	2,511	–	2,450 [g]	3,802	22,300	4,225 [c,d]	–
1988	348	–	2,046 [g]	–	21,600	825 [c,d]	–
1989	–	–	412 [g]	824 [e]	11,000	1,600 [c,d]	483
1990	688	–	–	15 [e]	8,325	2,375 [c,d]	–

[a] Only peak counts presented. Survey rating is fair to good, unless otherwise noted.
[b] Surveyed by F.R.E.D.
[c] Surveyed by Sport Fish Division.
[d] Boat survey.
[e] Poor survey.
[f] Foot survey.
[g] Weir count.
[h] Population estimate.

Appendix Table 38. Percent age composition of combined commercial and subsistence salmon harvest, Yukon River drainage, 1982–1990. a

Species	Year	Sample Size	Age 3	4	5	6	7	8	Total
Chinook	1982	3,795	0.2	6.8	18.5	58.3	15.9	0.3	100.0
Salmon	1983	3,801	0.0	6.6	21.0	62.9	9.4	0.0	100.0
	1984	3,700	0.0	3.7	27.0	56.0	13.1	0.1	100.0
	1985	4,567	0.1	5.7	13.2	69.4	11.3	0.3	100.0
	1986	5,785	0.3	3.9	27.2	42.8	25.1	0.6	100.0
	1987	5,300	0.0	4.2	8.4	72.5	14.5	0.3	100.0
	1988	5,108	0.1	14.8	22.8	31.5	29.4	1.4	100.0
	1989	4,310	0.3	5.8	32.2	51.9	9.0	0.8	100.0
	1990 b	3,553	0.0	21.8	26.1	46.3	5.7	0.1	100.0
Summer	1982	3,419	2.0	61.2	34.4	2.4			100.0
Chum	1983	4,110	1.0	53.8	44.4	0.8			100.0
Salmon	1984	2,722	2.0	73.7	23.9	0.5			100.0
	1985	2,472	1.4	68.6	29.2	0.8			100.0
	1986	3,473	0.1	29.1	69.8	1.0			100.0
	1987	2,184	0.4	60.8	31.8	6.9			100.0
	1988	5,112	0.0	70.1	29.1	0.8			100.0
	1989	4,482	0.5	41.2	57.6	0.7			100.0
	1990 b	3,155	0.4	37.4	59.8	2.4			100.0
Fall	1982	2,918	6.5	58.6	34.5	0.3			100.0
Chum	1983	1,735	0.7	91.4	8.0	0.0			100.0
Salmon	1984	1,902	6.6	55.6	37.5	0.4			100.0
	1985	2,801	5.2	83.4	11.0	0.4			100.0
	1986	1,715	7.4	89.6	2.5	0.5			100.0
	1987	1,513	5.0	77.1	17.5	0.4			100.0
	1988	4,030	4.1	45.7	46.6	3.5			99.9
	1989	2,792	1.1	85.8	12.8	0.3			100.0
	1990 b	2,351	2.9	74.9	21.8	0.4			100.0
Coho	1982	320	4.1	87.3	8.6				100.0
Salmon	1983	121	4.1	91.7	4.1				100.0
	1984	619	12.9	73.7	13.4				100.0
	1985	462	14.1	76.3	9.6				100.0
	1986	491	2.2	88.6	9.2				100.0
	1987	0							0.0
	1988	1,091	12.2	85.5	2.3				100.0
	1989	749	19.2	76.3	4.5				100.0
	1990 b	428	29.3	66.8	3.9				100.0

a Age composition estimated from samples collected from each gear type, by district and fishery, or from samples from adjacent fisheries of the same gear type. Fisheries for which no appropriate samples were available were not apportioned to age.
b Preliminary.

Appendix Table 39. Associated environmental and salmon catch data, Yukon River, 1961–1990.

Year	Average Nome April Air Temp. (F)	Tanana River Nenana Ice Breakup	Iceout 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
1988	23	4/27	5/20	5/27	5/16	6/09 h	5/27	6/09
1989	25	5/01	5/31	5/29 i	5/25	6/13 h	6/03	6/13
1990	26	4/23	5/28	5/29	5/22	6/14	5/31	6/14

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 Kalskag, back calculated arrival date to mouth.
h Special six inch maximum mesh size fishing period.
i Caught 6/01 St. Marys, back calculated arrival date to mouth.

Appendix Table 40. 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, 1964-1990.

	Japanese Mothership Gillnet		Japanese Landbased Driftnet		Japanese Total Gillnet		Bering Sea-Aleutian Area Trawl			Gulf of Alaska Trawl		
Year	Western Alaska Origin	Total	Western Alaska Origin	Total	Western Alaska Origin	Total	Foreign	Joint Venture/U.S. Groundfish d	Total	Foreign	Joint Venture/U.S. Groundfish e	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	162	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	36	82	21	92	57	174	a	a	b	11.1	63.2	74.3
1985	25	66	22	100	47	167	b	b	b	0.3	13.6	13.6
1986	24	60	20	76	44	137	0.3	4.0 c	4.3		18.0	18.0
1987	20	39	b	74	b	116	b	b	b		b	b
1988	23	26	b	47	b	73		b	b		b	b
1989	b	16	b	51	b	67		8.6	8.6			
1990	b,f	23	b	b	b	b		14.0	14.0		14.8	14.8

a Species composition unknown.
b Information not available.
c Longline harvest only, no trawling conducted in 1986.
d Joint-venture harvest reported through 1989 (fishery ended in 1990). U.S. ground fish fishery harvest reported beginning in 1990.
e Joint-venture harvest reported through 1988 when fishery ended. U.S. ground fish fishery harvest reported beginning in 1990.
f Japanese mothership fishery converted to "nontraditional landbased salmon fishery".

Appendix Table 41. Commercial herring fishing data, Cape Romanzof District, 1980–1990.

	1980	1981	1982	1983a	1984	1985	1986	1987	1988	1989	1990
Catch (st)	611	720	657	816	1,185	1,299	1,865	1,342	1,119	926	329
Hours Fished	326	120	180	144	90	60	42	8	11	13	3
Percent Roe Recovery	9.8	8.0	9.3	9.0	8.6	8.3	9.2	8.9	9.1	9.3	8.4
Estimated Value ($ millions)	0.13	0.21	0.22	0.37	0.31	0.55	1.14	1.00	1.02	0.49	0.15
Number of Buyers	2	4	2	3	3	2	5	9	6	6	4
Number of Fishermen	69	111	75	63	66	73	97	157	113	115	95
Number of Boats	54	82	50	57	59	69	90	152	108	110	90
% Effort by Local Fishermen	70	81	85	92	98.5	91	84	53	63	87	76
% Harvest by Local Fishermen	40	60	84	88	99.8	94	70	33	60	82	77
Biomass Estimate b	3,000	4,900	4,900	5,500	6,100	7,000	7,500	7,200	6,600	4,400	4,500
Exploitation Rate	20.4	14.7	13.4	14.8	19.4	18.6	24.9	18.6	17.0	21.0	7.3

a Exclusive Use Regulation into effect.
b Biomass estimates based on qualitative estimates of herring abundance to describe abundance trends, except for 1987, which was by aerial survey.

Appendix Table 42. Subsistence herring harvest (st) and effort data, Cape Romanzof, 1975–1990. 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
1988	2	2	4	7	32
1989	1	<1	2	3	24
1990	2	1	6	8	32

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

Appendix Table 43. Colville River commercial whitefish catches, 1964–1990. a

Year	Broad Whitefish	Humpback Whitefish	Arctic Cisco ("kaktok")	Least Cisco ("herring")
1964	2,951 b		16,000	9,000
1965	3,000 b		50,000	
1966	2,500 b		40,000	
1967	data not available			
1968	3,130		42,055	18,180
1969	data not available			
1970	2,080 b		19,602	25,930
1971	3,815	132	38,016	22,713
1972	3,850	1,497	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 c	20 d	1,102	17,292	21,589
1979	d	1,831	8,684	24,984
1980	d	4,231	14,657	31,459
1981	1,035	469	38,206	16,584
1982	1,662	201	15,067 e	25,746 e
1983	d	408 d	18,162	35,322
1984	789	179	27,686	13,076
1985	401	191	23,679	17,595
1986 f	0	18	29,895	9,444
1987 f	5	1,989	24,769	10,922
1988	429	6,733	10,287	23,910
1989	71	6,575	17,877	23,303
1990	0	5,694	19,374	21,003

a Numbers reflect fish harvested with the intent of commercial sale.
b Includes small numbers of humpback whitefish.
c Also reported taken were 1 chinook, 2 sockeye, 9 chum, and 118 pink salmon.
d No fishing effort during June or July.
e No fishing effort during November or December.
f 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 44. Commercial freshwater fishery catches, Upper Yukon Area, 1971–1990. a

	Healy Lake		Lake Minichumina		Tanana River				Yukon River			
	Whitefish		Whitefish		Burbot		Whitefish		Burbot		Whitefish	
Year	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
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											
1988	no effort						837	–				
1989	no effort								1	–	–	2,070
1990	no effort		no effort		1	–	809	–	0	0	985	2,078

a Numbers reflect fish harvested with the intent of commercial sale.

Appendix Table 45. Commercial freshwater fishery catches, Lower Yukon Area, 1978–1990.

	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	–	–	–	–	–
1988	–	–	696	2,171	–	–	–	–	–
1989	–	–	–	–	–	–	–	–	–
1990	–	–	180	260	–	–	–	–	–

Attachment 1. List of Lower Yukon Area Emergency Orders, 1990

E.O. Number	Date	Action Taken	Comments
3-LY-01-90	May 23	Established a commercial herring fishing period beginning 10:30 p.m. May 23 until 1:30 a.m. May 24 in the Cape Romanzof District. Additionally, restricted gear to 50 fathoms per vessel.	Beach party samples and spawning ground surveys indicated an abundance of herring with good roe quality. Due to 90-100 fishing vessels on grounds and increased efficiency of fleet in recent years, gear restriction was warranted.
3-LY-02-90	June 14	Opened the commercial salmon season effective 6:00 p.m. June 14 in District 1, and established a single 9 hour fishing period in District 1 from 6:00 p.m. June 14 until 3:00 a.m. June 15.	Approximately 7-10 days of increasing chinook salmon subsistence and test fishing catches warrant an unrestricted mesh size fishing period.
3-LY-03-90	June 18	Opened the commercial salmon fishing season effective 6:00 a.m. June 18 in District 2 and established a single 9 hour fishing period in District 2 from 6:00 a.m. until 3:00 p.m. June 18.	Chinook salmon abundance continued to indicate a harvestable surplus according to commercial and test fishing catches since June 14.
3-LY-04-90	June 18	Established a 12 hour commercial fishing period in District 1 from 6:00 p.m. June 18 until 6:00 a.m. June 19 with gill nets restricted to six inch or smaller mesh size.	Test fishing catch rates indicate an increasing abundance of summer chum salmon. Preseason projection was for a very large return.
3-LY-05-90	June 18	Prohibited commercial fishermen from taking salmon for subsistence and personal use purposes by gill nets with a mesh size larger than six inch maximum mesh size during commercial fishing	Action taken to prevent chinook salmon harvested under guise of subsistence and personal use from entering the commercial market.

E.O. Number	Late	Action Taken	Comments
		periods restricted to six inch or smaller mesh size; in District 1 beginning 6:00 p.m. June 18 and in District 2 beginning 6:00 p.m. June 20.	
3-LY-06-90	June 20	Established a 12 hour commercial fishing period in District 2 from 6:00 p.m. June 20 until 6:00 a.m. June 21 with gill nets restricted to six inch or smaller mesh size.	Test fishing catch rates indicated an increasing abundance of summer chum salmon.
3-LY-07-90	June 21	Established a 12 hour commercial fishing period (unrestricted mesh size) from 6:00 p.m. June 21 until 6:00 a.m. June 22 in District 1.	Test fishing and sonar passage data indicated a harvestable surplus of chinook salmon was present.
3-LY-08-90	June 22	Established special 24-hour subsistence fishing periods every other weekend during the commercial salmon fishing season in Districts 1 and 2. Specifically this emergency order opened subsistence fishing from 6:00 p.m. June 23 until 6:00 p.m. June 24 and from 6:00 p.m. July 7 until 6:00 p.m. July 8 in District 1. In District 2, subsistence fishing opened from 6:00 p.m. June 22 until 6:00 p.m. June 23 and from 6:00 p.m. July 6 until 6:00 p.m. July 7.	Special subsistence fishing periods established by emergency order as stipulated by regulation to provide for increased subsistence fishing opportunity.
3-LY-09-90	June 24	Opened the commercial salmon unrestricted mesh size fishing season effective 6:00 a.m. June 24 in District 3 of the Yukon area. Also established an 18 hour fishing period in District 3 from 6:00 a.m. June 24 until 12:00 midnight June 24.	Test fish and subsistence catch data indicated that chinook salmon were present in harvestable numbers in the lower 300 miles of the river.

E.O. Number	Date	Action Taken	Comments
3-LY-10-90	June 24	Established a 6 hour commercial fishing period (unrestricted mesh size) from 6:00 p.m. June 24 until 12:00 midnight June 24 in District 2.	Test fishing and sonar passage data indicated a harvestable surplus of chinook salmon was present. However, the cumulative harvest was approaching 60,000 fish. Therefore, the period was reduced to 6 hours duration.
3-LY-11-90	June 27	Established a 9 hour commercial fishing period (unrestricted mesh size) from 6:00 p.m. June 27 until 3:00 a.m. June 28 in District 3. Also established a 9 hour commercial fishing period (unrestricted mesh size) from 6:00 p.m. June 28 until 3:00 a.m. June 29 in District 1.	The chinook salmon return appeared to be average in magnitude. Therefore a harvest near the mid-point of the guideline harvest range was warranted. Test fishing and sonar passage data indicated the summer chum return was below average in magnitude to date and probably late run timing.
3-LY-12-90	June 28	Closed the commercial fishing season in District 3 effective 3:00 a.m. June 28.	District 3 closed because the upper end of the chinook salmon guideline harvest range was exceeded.
3-LY-13-90	June 29	Established a chum salmon directed 6 hour commercial fishing period from 6:00 p.m. Friday, June 29 until 12:00 midnight Friday June 29 with gill nets restricted to six inch or smaller mesh size in District 2.	Chum salmon return appeared to exhibit late run timing and there appeared to be an increase in abundance according to test fishing catches.
3-LY-14-90	July 1	Established a 12 hour commercial fishing period (unrestricted mesh size) from 6:00 p.m. July 1 until 6:00 a.m. July 2 in District 2.	Chinook return appeared to be average in abundance which would allow a harvest near the mid-point of the guideline harvest

E.O. Number	Date	Action Taken	Comments
			range. Summer chum return was of late run timing.
3-LY-15-90	June 30	Amended emergency order 3-LY-08-90 and established an additional 24 hour subsistence and personal use only fishing period from 6:00 p.m. June 30 until 6:00 p.m. July 1 in District 1.	To provide increased subsistence fishing opportunity because of decreased fishing time since June 25.
3-LY-16-90	July 2	Established a 12 hour commercial fishing period from 6:00 p.m. July 2 until 6:00 a.m. July 3 in District 1.	According to test fishing and sonar data, the chinook return appeared to be of average magnitude, while the summer chum return appeared to be much lower than expected preseason.
3-LY-17-90	July 4	Established a 12 hour commercial fishing period from 6:00 p.m. July 4 until 6:00 a.m. July 5 in District 2.	According to test fishing and sonar data, the chinook return appeared to be of average magnitude, while the summer chum return appeared to be much lower than expected preseason.
3-LY-18-90	July 7	Closed the commercial salmon fishing season effective 6:00 p.m. July 7 in Districts 1 and 2.	Test fishing and sonar passage date indicated a rapid decrease in chinook salmon abundance. The summer chum return appeared to be below average. The summer chum commercial catch was slightly above the lower end of the guideline harvest range, and further fishing was not warranted.
3-LY-19-90	July 23	Opened commercial salmon fishing season effective 8:00 p.m. July 23 in District	Sonar evaluation and test fishing and subsistence catch

E.O. Number	Date	Action Taken	Comments
		1 and 9:00 a.m. July 25 in District 2. Also established twice weekly fishing periods, with gill nets restricted to six inch maximum mesh size, of 12 hours duration in the set net only area of District 1 from 8:00 p.m. Monday until 8:00 a.m. Tuesday, and from 8:00 p.m. Thursday until 8:00 a.m. Friday; and of six hours duration in the remainder of District 1 from 9:00 a.m. until 3:00 p.m. Tuesday and from 9:00 a.m. until 3:00 p.m. Friday. Twice weekly fishing periods in District 2 from 9:00 a.m. until 3:00 p.m. Sunday and from 9:00 a.m. until 3:00 p.m. Wednesday.	rates indicated a harvestable surplus of fall chum salmon were available.
3-LY-20-90	July 27	Established 24 hour subsistence fishing periods each weekend during the commercial salmon fishing season in Districts 1 and 2 as follows: from 12:00 noon Saturday until 12:00 noon Sunday in District 1, and from 12:00 noon Friday until 12:00 noon Saturday in District 2.	Regulations require this action for the gill net area of District 1 and for District 2. The District 1 set net only area was included in response to significant reduction in commercial fishing period duration from prior years.
3-LY-21-90	July 29	Opened commercial fishing season effective 9:00 a.m. July 29 in District 3. Also established twice weekly fishing periods, with gill nets restricted to six inch maximum mesh size, of six hours duration in District 3 from 9:00 a.m. Sunday until 3:00 p.m. Sunday and from 9:00 a.m. Wednesday until 3:00 p.m. Wednesday.	Sonar evaluation and test fishing and subsistence catch rates indicated a harvestable surplus of fall chum salmon were available. District 3 periods opened concurrently with District 2 to allow District 3 fishermen access to District 2 buyers.

E.O. Number	Date	Action Taken	Comments
3-LY-22-90	Aug. 3	Established 24 hour subsistence fishing periods each weekend during the commercial salmon fishing season in District 3 as follows: 12:00 noon Friday until 12:00 noon Saturday.	Regulations require this action for the gill net area of District 1 and for District 2. District 3 was allowed additional subsistence fishing periods in response to significant reduction in commercial fishing period duration from prior years.
3-LY-23-90	Aug. 9	Amended scheduled fishing periods for Districts 1, 2, and 3. Specifically canceled fishing periods on August 9 and August 10 in District 1, and on August 12 in Districts 2 and 3.	Based on harvest to date, sonar enumeration, and test net data, it was warranted to decrease commercial fishing time.
3-LY-24-90	Aug. 13	Voided commercial fishing period schedules established by emergency orders 3-LY-19-90 and 3-LY-21-90. Future commercial fishing periods to be announced by emergency order.	Based on harvest to date, sonar enumeration, and test fishing data, it was warranted to delay commercial fishing to re-assess run strength and to assure a great enough portion of this run segment be allowed to pass the lower river area to provide for spawning escapement and upriver subsistence and commercial fisheries needs.
3-LY-25-90	Aug. 15	Established an additional 12 hour subsistence only fishing period in Districts 1, 2, and 3 from 6:00 a.m. August 15 until 6:00 p.m. August 15.	To provide for additional subsistence fishing opportunity due to decreased commercial fishing time.
3-LY-26-90	Aug. 20	Established commercial fishing periods as follows: 6:00 a.m. until 6:00 p.m.	Based on sonar and test fishing data, a harvestable surplus of

E.O. Number	Date	Action Taken	Comments
		August 20 in the set net only area of District 1, 12:00 noon until 6:00 p.m. in the remainder of District 1, and from 12:00 noon until 6:00 p.m. August 21 in Districts 2 and 3.	fall chum and coho salmon was available to allow a harvest near the lower end of the guideline harvest range.
3-LY-27-90	Aug. 21	Closed the commercial salmon fishing season effective 6:00 p.m. August 21 in Districts 1, 2, and 3.	Fishery closed to ensure that the majority of fall chum salmon spawning area escapement objectives would be achieved, that subsistence requirements would be met, and that upper Yukon area commercial fisheries would have opportunity to achieve commercial harvests of similar proportion toward their respective guidelines.

ATTACHMENT 2. List of Upper Yukon Emergency Orders, 1990.

E.O. Number	Effective Date	Action Taken	Comments
3-F-UY-01-90	June 15	Allow personal use and subsistence fishing for whitefish and suckers in the main Tanana River and its adjoining sloughs between the mouth of the Salcha River and the mouth of the Gerstle River.	After consulting with Sport Fish Division and Subsistence Division, it was agreed that whitefish and sucker populations in the main Tanana River between the Salcha River and the Gerstle River are healthy and can support a regulated harvest.
3-F-UY-02-90	June 24	Open the commercial salmon season in District 4 of the Yukon River.	Based on department test net catches, Pilot Station sonar enumeration, and preliminary commercial catches in District 1, the Yukon River chinook and summer chum salmon runs appear to be near forecasted. With initial subsistence needs being fulfilled and a harvestable surplus of chinook and summer chum salmon available, a commercial fishery in District 4 is now warranted.
3-F-UY-03-90	June 24	Modifies the subsistence salmon fishing schedule in District 4 of the Yukon River.	With initial subsistence needs being fulfilled and a harvestable surplus of chinook and summer chum salmon available, the commercial salmon fishing season in District 4 has been announced for June 24. In order to provide for an orderly fishery, the subsistence fishing schedule has been modified to coincide with the announced commercial salmon fishing periods.
3-F-UY-04-90	June 29	Open the Yukon area Subdistrict 5-A, 5-B and 5-C commercial salmon fishing season with an established fishing schedule of two 48-hour periods per week.	The Yukon River chinook and summer chum salmon runs appear to be near forecasted based on department test net catches, Pilot Station sonar enumeration and preliminary commercial catch statistics in Districts 1 and 2. With initial subsistence needs being fulfilled and a harvestable surplus of chinook and summer chum salmon available, a commercial fishery in Subdistricts 5-A, 5-B and 5-C is now warranted.
3-F-UY-05-90	June 26	Allow a special 24-hour subsistence drift-gillnet only fishery for a portion of Subdistrict 4-A of the Yukon River.	Subsistence drift-gillnet fishermen have contacted the Division of Commercial Fisheries office in Fairbanks and notified the department that additional fishing opportunities are needed to provide for their subsistence needs. A special 24-hour subsistence drift-gillnet only fishery for the portion of Subdistrict 4-A above Stink Creek is therefore appropriate.
3-F-UY-06-90	July 6	Open the Yukon area Subdistrict 5-D commercial salmon fishing season. Establish a commercial fishing schedule of two 48-hour periods per week.	The Yukon River chinook salmon run appears to be near forecasted based on department test net catches, Pilot Station sonar enumeration and preliminary commercial catch statistics in the lower portions of the Yukon River. To distribute the commercial harvest over a larger portion of the run and allow more reliable monitoring of the commercial fishing harvest, it is necessary to reduce Subdistrict 5-D's 7 day a week commercial fishing schedule as established by regulation, and install closed commercial fishing periods.

ATTACHMENT 2 (Continued)

E.O. Number	Effective Date	Action Taken	Comments
3-F-UY-07-90	July 4	Change the commercial salmon fishing schedule in Subdistrict 4-A of the Yukon River to two 24-hour periods per week.	It is expected that the current, on-going third period in Subdistrict 4-A will approach a harvest 50,000 summer chum salmon. Season total is estimated to be near the low end of the harvest guideline range of 113,000 fish. Due to below average return of Yukon River summer chum salmon, the targeted commercial harvest for Subdistrict 4-A has been reduced to 170,000 summer chum salmon, or slightly above the low end of the guideline harvest range. It is therefore appropriate to reduce allowable fishing time to two 24-hour periods per week to distribute the harvest on those stocks present in the fishery.
3-F-UY-08-90	July 4	Modify the fish wheel, set-gillnet and drift-gillnet subsistence salmon fishing schedule in Subdistrict 4-A of the Yukon River.	In order to provide for an orderly fishery, the subsistence fishing schedule, which is normally two 48-hour periods per week, was modified to coincide with the announced commercial salmon fishing periods.
3-F-UY-09-90	July 6	Reduce and establish a commercial fishing schedule of two 24-hour periods a week for Yukon River Subdistricts 5-A, 5-B and 5-C.	Reducing and establishing a commercial fishing schedule for two 24-hour periods a week will allow more reliable monitoring of the commercial salmon harvest, and distribute the remaining harvest over a larger portion of the chinook salmon migration.
3-F-UY-10-90	July 8	Close the commercial salmon fishing season in Subdistrict 4-A of the Yukon River and leave Subdistricts 4-B and 4-C on two 48-hour fishing periods per week.	The department's preseason projection of an above average summer chum salmon return into the Yukon River did not develop. Since Subdistrict 4-B and 4-C summer chum salmon harvests are still below the targeted harvest level of slightly over halfway to the low end of the Subdistrict 4-B and 4-C guideline harvest range of 16,000 fish, it is appropriate to leave these subdistricts on a two 48-hour period per week fishing schedule.
3-F-UY-11-90	July 10	Close commercial fishing in Subdistricts 5-A, 5-B and 5-C until further notice.	The cumulative commercial harvest in Subdistricts 5-A, 5-B and 5-C is 2,806 chinook salmon. This catch is near the upper end of the Subdistrict 5-A, 5-B and 5-C Guideline Harvest Range of 2,400 to 2,800 chinook salmon. Subdistricts 5-A, 5-B and 5-C will remain closed to commercial fishing until mid-August when commercial fishing is expected to resume for fall chum and coho salmon.
3-F-UY-12-90	July 10	Reduce and establish a commercial fishing schedule of two 24-hour periods a week for the upper Yukon River Subdistrict 5-D.	Reducing and establishing a Subdistrict 5-D commercial fishing schedule of two 24-hour periods a week will allow more reliable monitoring of the commercial salmon harvest, and possibly distribute the remaining harvest over a larger portion of the chinook salmon migration.

ATTACHMENT 2 (Continued)

E.O. Number	Effective Date	Action Taken	Comments
3-F-UY-13-90	July 13	Open the commercial salmon season in District 6 of the Tanana River.	The early portion of the chinook salmon run should be above the commercial fisheries. With initial subsistence needs being fulfilled, the early portion of the chinook salmon migration allotted for escapement, and a harvestable surplus of chinook and summer chum salmon available, a commercial fisheries is now warranted in District 6.
3-F-UY-14-90	July 12	Close the commercial salmon fishery in Subdistrict 5-D until further notice.	The cumulative commercial harvest in Subdistrict 5-D is 518 chinook salmon. This catch exceeds the upper end of the Subdistrict 5-D Guideline Harvest Range of 300 to 500 chinook salmon. Subdistrict 5-D will remain closed to commercial fishing until later in August when commercial fishing is expected to resume for fall chum and coho salmon.
3-F-UY-15-90	July 14	Close the commercial salmon fishing season in Subdistricts 4-B and 4-C of the Yukon River.	The department's preseason projection of an above average summer chum salmon return into the Yukon River did not develop. Subdistricts 4-B and 4-C have reached the targeted harvest for these areas.
3-F-UY-16-90	July 15	Close the commercial salmon fishery in District 6 of the Tanana River until further notice.	Aerial surveys will be conducted this week to determine whether chinook salmon escapement objectives will be met. Until the department has indication that the escapement objective of chinook salmon will be met, no additional fishing will be allowed during the remainder of the chinook salmon migration.
3-F-UY-17-90	July 23	Open the commercial salmon fishery in District 6 of the Tanana River beginning Monday, July 23.	Aerial surveys conducted indicate chinook salmon are entering the major Tanana River index streams. However, the number of fish observed is still below escapement objectives. By July 23, based on historical run timing, the majority of the chinook salmon will be on the spawning grounds.
3-F-UY-18-90	August 5	Close the commercial salmon fishery in District 6 of the Tanana River.	Indications are that the Tanana River, like the Yukon River, is experiencing a below average return of summer chum salmon. Since the lower end of the summer chum salmon Guideline Harvest Range has been reached, District 6 will now close.
3-F-UY-19-90	August 22	Open the fall commercial salmon fishing season in Subdistricts 4-B and 4-C of the Yukon River.	Indications are that the Yukon River is experiencing a below average return of fall chum salmon. Based on a thorough review of test net, sonar, and commercial and subsistence catches, the department has determined that the fall chum run size is large enough to allow all districts to harvest near the lower end of the their Guideline Harvest Range and still meet escapement and subsistence needs. It is therefore appropriate to open the fall commercial fishing season in Subdistricts 4-B and 4-C.

ATTACHMENT 2 (Continued)

E.O. Number	Effective Date	Action Taken	Comments
3-F-UY-20-90	August 28	Open the fall season and establish a commercial fishing schedule of two 24-hour periods a week for Yukon River Subdistricts 5-A, 5-B and 5-C.	Indications are that the Yukon River is experiencing a below average return of fall chum salmon. Based on a thorough review of test net, sonar, and commercial and subsistence catches, the department has determined that the fall chum salmon run size is large enough to allow all districts to harvest at the low end of their Guideline Harvest Range and still meet escapement and subsistence needs. A Subdistrict 5-A, 5-B and 5-C commercial fishery is now warranted.
3-F-UY-21-90	August 29	Close the commercial salmon fishing season in Subdistricts 4-B and 4-C of the Yukon River until further notice.	Based on a thorough review of all available information, the department has evaluated the fall chum salmon run to be below average. The commercial harvest has exceeded the low end of the fall chum salmon Guideline Harvest Range of 5,000 fish. It is therefore appropriate to close the commercial fall chum salmon season in Subdistricts 4-B and 4-C at this time.
3-F-UY-22-90	August 30	Close the commercial fishing in Subdistricts 5-A, 5-B and 5-C until further notice.	The commercial harvest exceeded the lower end of the Subdistrict 5-A, 5-B and 5-C fall chum salmon Guideline Harvest Range of 4,000 fish. It is therefore appropriate to close Subdistricts 5-A, 5-B and 5-C to commercial fishing until it can be determined that additional commercial harvest will not jeopardize the escapement requirements or the subsistence priority.
3-F-UY-23-90	September 7	Open the Yukon area Subdistrict 5-D effective 6:00 p.m. for a 48-hour commercial period.	The fall chum salmon run should now be well distributed throughout Subdistrict 5-D. With initial subsistence needs being fulfilled and a harvestable surplus of fall chum salmon available, a Subdistrict 5-D commercial fishery is now warranted.
3-F-UY-24-90	September 10	Open the Tanana River commercial salmon fishery in each subdistrict of District 6 on a staggered basis beginning September 10. Adjust the Subdistrict 6-A subsistence fishing time to continue to allow 84 hours of subsistence fishing a week.	Although reliable estimates of the Tanana River salmon run strength are not available, subsistence fishermen harvest reports and contracted test fish wheel catches indicate that fall chum salmon are sufficiently abundant to warrant a commercial opening. Additionally, to compensate for lost subsistence fishing in Subdistrict 6-A because of the time reduction in the commercial fishing period, additional subsistence fishing time has been scheduled during the subsistence only fishing period.

ATTACHMENT 2 (Continued)

E.O. Number	Effective Date	Action Taken	Comments
3-F-UY-25-90	September 17	Open the Tanana River commercial salmon fishery in each subdistrict of District 6 on a staggered basis beginning September 17. Adjust the Subdistrict 6-A subsistence fishing time to continue to allow 84 hours of subsistence fishing a week.	Although reliable estimates of the Tanana River salmon run strength are not available, subsistence fishermen harvest reports and contracted test fish wheel catches indicate that fall chum salmon are sufficiently abundant to warrant a commercial opening. Additionally, to compensate for lost subsistence fishing in Subdistrict 6-A because of the time reduction in the commercial fishing period, additional subsistence fishing time has been scheduled during the subsistence only fishing period.
3-F-UY-26-90	September 24	Announce the commercial salmon fishing schedule in District 6 of the Tanana River for the week September 23-30, 1990. Adjust the Subdistrict 6-A subsistence fishing time to compensate for lost fishing time due to regulatory reductions in the commercial fishing time during the fall season.	Sustained high catches in department contracted test fish wheels, the large harvest the previous two periods, low subsistence effort to date, and the increasing percentage of coho salmon in the harvest all indicate that fall chum and coho salmon are sufficiently abundant to warrant another commercial period without jeopardizing escapement or subsistence needs.

Attachment 3. Summary of Yukon Area regulations adopted by the Alaska Board of Fisheries during November 1989 and February 1990 hearings.

Regulations

Regulation	Board of Fisheries Action
	Subsistence
5 AAC 01.225.	Establish the closing of the subsistence salmon fishery for chum salmon from August 15 to December 31 in the Toklat River and the Kantishna River, from the confluence of the Toklat River to the Tanana River.
	Personal Use
5 AAC 77.170.	Reduces personal use annual possession limit per permit holder in Subdistricts 6-A and 6-B to be consistent with Subdistrict 6-C limits of 10 king salmon and 75 chum salmon through August 15, and 75 chum and coho salmon combined after August 15.
5 AAC 77.190.	Allows personal use fishing for whitefish and suckers by permit only in the drainages of Districts 5 and 6. The department shall use discretion in the issuance of permits based on resource abundance, sustainable yield, and the prospect of an orderly fishery.
5 AAC 77.157.	Establish the closing of the personal use salmon fishery for chum salmon from August 15 to December 31 in the Toklat River and the Kantishna River, from the confluence of the Toklat River to the Tanana River.
5 AAC 77.130.	Delete the repeal date for personal use herring fishery in the Yukon Area.
	Commercial
5 AAC 05.310.	Establish the opening and closing of the District 5 and 6 commercial seasons by emergency order.

5 AAC 05.365. YUKON RIVER FALL CHUM SALMON MANAGEMENT PLAN. The guideline harvest range for fall chum salmon was increased to 72,750 to 320,500 fish and distributed as follows:

Districts 1, 2, and 3 - 60,000 to 220,000 chums.

Subdistricts 4-B and 4-C - 5,000 to 40,000 chum and coho salmon combined.

Subdistricts 5-A, 5-B, and 5-C - 4,000 to 36,000 chum and coho salmon combined.

Subdistrict 5-D - 1,000 to 4,000 chum and coho salmon combined.

District 6 - 2,750 to 20,500 chum and coho salmon combined.

5 AAC 05.367. TANANA RIVER SALMON MANAGEMENT PLAN. Reduces the Tanana River Subdistrict 6-A commercial salmon fishing schedule to no more than one 24-hour period per week during the fall fishing schedule.

5 AAC 05.362. YUKON RIVER SUMMER CHUM MANAGEMENT PLAN. A new guideline harvest range of 400,000 to 1,200,000 summer chum salmon was established by the Board of Fisheries, and distributed as follows:

Districts 1 and 2 - 251,000 to 755,000 summer chum salmon.

District 3 - 6,000 to 19,000 summer chum salmon.

Subdistrict 4-A - 113,000 to 338,000 summer chum salmon or the equivalent roe poundage of 61,000 to 183,000 pounds roe. No more than 183,000 pounds of summer chum roe may be sold annually; however, if roe cap is reached, only the sale of fish in the round will be allowed.

All salmon caught by CFEC permit holders during commercial periods will be reported in numbers on fish tickets. Fish taken from commercial catches in Subdistrict 4-A and used for subsistence purposes are to be reported in commercial catch.

Subdistricts 4-B and 4-C - 16,000 to 47,000 summer chum salmon.

District 5 - 1,000 to 3,000 summer chum salmon.

District 6 - 13,000 to 38,000 summer chum salmon.

5 AAC 39.107 OPERATION OF GEAR. A person who holds a CFEC permit for stationary fishing gear must be physically present at a beach or riparian fishing site during the operation of net gear or other stationary fishing gear at the site except when the permit holder is at or traveling to or from the location of: (1) a sale of fish caught in the gear; or (2) other stationary gear of the permit holder. For the purposes of this section, "fishing site" includes any structure used for providing shelter or support of the operation of net gear of other stationary fishing gear. In the Yukon area, the permit holder must be physically present for the initial deployment and termination of gear operation for each commercial fishing period.

5 AAC 27.050. Bering Sea Commercial Herring. Increase maximum mesh size for herring gill nets in Statistical Areas T, W and Q to 3 1/2 inches.

Attachment 4. Summary of special projects conducted in the Yukon Area, 1990.

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: Kwikluak 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 and Middle Mouth Set Net Test Fishing Projects: Sites 1 and 2 combined catches.

a) CHINOOK AND SUMMER CHUM SALMON: Index set nets for chinook and summer chum salmon were operated from May 31 to July 15. A total of 1,721 chinook and 5,220 summer chum salmon were captured. Catches of smaller chinook salmon in 5.5 inch gill nets were the largest in the history of the project. The mean date (the date on which statistically the central portion of the migration passed the test fishery) for chinook and summer chum salmon was June 19 and 26, respectively. The chinook salmon return appeared to be about average in abundance. Relative abundance of summer chum salmon appeared to be below average and similar to 1982 and 1987.

b) FALL CHUM AND COHO SALMON: Index set nets for fall chum and coho salmon were operated from July 16 until August 27. A total of 2,146 fall chum and 1,710 coho salmon were caught. Fall chum salmon catches indicated a near average return. Coho salmon test fishing catches indicated the run was late in timing, and a strong return. Test fishing data indicated mean dates of August 8 and August 22 for fall chum and coho salmon, respectively.

2) Middle Mouth Test Fishing Project: Site 3 catches.

a) FALL CHUM AND COHO SALMON: An additional index set net site for fall chum and coho salmon was fished from July

16 until August 23. A total of 1,792 fall chum and 976 coho salmon were captured. Historically, this site in Middle Mouth has been very effective in catching fall chum salmon and has been used since 1985. The cumulative 1990 season index was the lowest ever for this site. The mean date of migration past this site was calculated to be August 9 for fall chum, however, test fishing was terminated early on August 23.

3) BIG EDDY DRIFT TEST FISHING PROJECT:

Drift test fishing for chinook salmon was conducted for the fourth season in 1990. 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 1 through June 30. A total of 730 chinook and 1,450 summer chum salmon were captured. Chinook salmon catches were the largest since the project was initiated. Large numbers of small chinook salmon "jacks" were captured. Summer chum catches were similar to 1989.

2. UPPER YUKON RIVER TEST FISHING

a. Location:

1) Ruby Test Fish Wheel: North bank of Yukon River approximately 21 miles upstream from Ruby.

2) Manley Test Fish Wheel: North bank of Tanana River near Manley Hot Springs.

3) Nenana Test Fish Wheel: North bank of Tanana River near Nenana.

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

c. Results:

1) Ruby Test Fish Wheel: The Ruby north bank test fish wheel was run from August 8 through September 15. During that time, a cumulative total of 4,444 fall chum salmon were caught. The timing was normal with the median date occurring on August 29.

2) Manley Test Fish Wheel: The Manley test fish wheel was operated from August 9 through September 24. A total of 18,248 fall chum and 4,074 coho salmon were captured. The

fall chum run peeked during September 5-10 and the coho return peaked September 16-21.

3) Nenana Test Fish Wheel: The Nenana test fish wheel was operated from August 9 through September 28. A total of 4,678 fall chum and 1,945 coho salmon were caught. Extremely high water caused operational problems and timing information can not be detected from the data.

3. MAIN RIVER SONAR

a. Location:

1) Yukon River Sonar - River mile 123, approximately one mile upstream of Pilot station. This sampling site has been used since 1985.

2) Tanana River Sonar - mile 45 of the Tanana River near Manely Hot Springs

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

c. Results: Sonar was operational on both banks of the Yukon River between June 5 and September 4 in 1990. Six mesh sizes of gill net were fished throughout the season to give data for development of species composition estimates. The program estimated passage of 129,000 chinook salmon, 937,000 summer chum salmon, 482,000 fall chum salmon, and 229,000 coho salmon. Two methodology changes were incorporated during the 1990 season. Test fishing catches of tangled as well as those wedged in the net were used for species apportionment. In addition, chinook catches in 6.5 inch mesh nets were included for the first time in apportioning counts.

Offshore fish passage beyond the sonar range was observed for the first time during the fall season. Horizontal transects conducted across the unensonified portion of the River were used to expand fish counts.

This was the first season that the sonar was operated on the mainstem Tanana River. A field camp was established, hydroacoustic target data were collected, and drift gill nets were used to sample fish for species and size information. This project will require several more seasons to become fully operational.

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 for use in formulating future management procedures and goals.

c. Results: An estimated 1,312 fishing households in the Yukon River drainage in Alaska harvested approximately 52,113 chinook, 118,471 summer chum, 182,003 fall chum, and 47,816 coho salmon. Catch and effort information was obtained by personal interviews, permits, and catch questionnaires. Yukon Territory subsistence catch data(7,603 chinook and 6,085 fall chum salmon) was furnished by the Canadian Department of Fisheries and Oceans (DFO) (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 inseason and postseason basis. Also, provide scale samples of chinook salmon to the stock identification research project for catch allocation to stock of origin based on scale patterns analysis. In addition, department crews assisted USFWS with collection of tissue samples from the District 1 commercial and test fisheries for genetic stock identification studies (GSI).

c. Results: Approximately 3,553 chinook salmon, 3,115 summer chum salmon, 2,351 fall chum salmon, and 428 coho salmon were sampled from fishery harvests in 1990. Preliminary age and sex composition estimates for the lower river commercial fishery were obtained on an in-season basis for management purposes. Samples from upper river fisheries were aged on a post-season basis. Overall age composition of the combined commercial and subsistence harvests by species were as follows:

1) Chinook salmon: 0.0% age 3, 21.8% age 4, 26.1% age 5, 46.3% age 6, 5.7% age 7, and 0.1% age 8 fish.
2) Summer chum salmon: 0.4% age 3, 37.4% age 4, 59.8% age 5, and 2.4% age 6 fish.
3) Fall chum salmon: 2.9% age 3, 74.9% age 4, 21.8% age 5, and 0.4% age 6 fish.
4) Coho salmon: 29.3% age 3, 66.8% age 4, and 3.9% age 5 fish.

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. Escapement carcass samples were collected from the Andreafsky, Anvik, Chena, Salcha, and Goodpaster Rivers in Alaska, and from the Big Salmon, Little Salmon,

Tatchun (Creek), Nisutlen, McQueston, Nordenskjold, Morley, Takhini, and mainstem Yukon Rivers in Yukon Territory. Samples were primarily collected from carcasses. Additional catch and escapement samples from the Yukon Territory were provided by the Canadian Department of Fisheries and Oceans (DFO).

b. Objectives: Allocate Yukon River commercial and subsistence chinook salmon harvests to stock region of origin by fishing district and time period based on a combination of scale pattern analysis, age composition, and geographic distribution. Assess the quality of spawning escapements relating to potential productivity, and monitor the effects of harvest management strategy on spawning escapements by stock.

c. Results: All escapement samples, and catch samples not aged during the season, were aged on a post-season basis. Age, sex, and size composition data are compiled, and are preliminary. Scale patterns from approximately 2,000 chinook salmon catch and escapement samples were analyzed using a computer based digitizing station. Scale measurements were used to estimate Yukon River fishery harvests by region of origin. Preliminary results indicated approximately 42% of the total drainage chinook salmon harvest was of U.S. origin.

7. 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 were collected by carcass survey under the Chinook Salmon Stock Biology Project.

c. Results: Salmon escapement counting was conducted from June 21 through July 26. The season total escapement estimate was 403,627 summer chum salmon (30% above the escapement objective of 487,000 fish). It appeared that the age 4 return from the 1986 parent year escapement of 1.2 million fish was much lower than expected.

Chum salmon age composition for 399 samples was 30.1% age 5, 65.1% age 4, 3.2% age 3, and 1.6% age 6. Females accounted for 56.9% of the sample. Unlike previous years, sample percentages for summer chum salmon were weighted by time period and escapement counts. Chinook salmon age composition for 407 samples was 21.5% age 5, 43.8% age 6, 26.3% age 4, and 3.8% age 7. Females accounted for 37% of the total sample.

8. 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 preliminary sonar-estimated escapement to the Sheenjek River in 1990 was 65,700 fall chum salmon for the period August 24 to September 25. However, additional chum salmon were present in the river prior to initiation of sonar operations based upon an aerial survey of the river on August 22.

Preliminary results from aging vertebrae reveal overall age composition of the 1990 Sheenjek River fall chum salmon run to be approximately 2.8% age 3 fish, 70.6% age 4 fish, 25.2% age 5 fish, and 1.4% age 6 fish.

9. DELTA RIVER ESCAPEMENT STUDY

a. Location: Lower one mile of Delta River floodplain (Tanana River drainage).

b. Objectives: Estimate total fall chum salmon spawning abundance to the Delta River using replicate ground surveys and stream life data and collect salmon age, sex, and size information from a sampled portion of the run.

c. Results: A population estimate of 8,992 fall chum salmon spawners was generated for the Delta River in 1990 based upon 10 ground surveys conducted between October 9 and December 19. It was observed that distribution of spawning throughout the lower floodplain was markedly different than in previous years. Further, run timing in 1990 to the Delta River was quite late.

Preliminary results from aging vertebrae reveal overall age composition of the 1990 Delta River fall chum salmon run to be approximately 6.9% age 3 fish, 64.8% age 4 fish, 25.2% age 5 fish, and 3.1% age 6 fish. Fall chum salmon samples were also collected for subsequent analyses in support of on-going genetic stock identification studies.

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

a. Location: Rivermile 13 of the Chandalar River (Porcupine River drainage).

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

c. Results: The preliminary sonar-estimated escapement to the Chandalar River in 1990 was 78,631 fall chum salmon for the period August 10 through September 27. Although most salmon were oriented nearshore, the preliminary estimate is considered conservative as counts do not include fish passing in the mid-stream uninsonified zone. Further, fish were present before and after sonar equipment was in operation. The 1990 run was bimodal in nature.

An estimated 11,890 chum salmon were observed in a helicopter survey of the river between the sonar site and confluence of the East Fork Chandalar River on September 25, representing approximately 15% of the sonar-estimated escapement.

Preliminary results from aging vertebrae reveal overall age composition of the 1990 Chandalar River fall chum salmon run to be approximately 0.7% age 3 fish, 56.2% age 4 fish, 39.2% age 5 fish, and 3.9% age 6 fish. Fall chum salmon samples were also collected for subsequent analyses in support of on-going genetic stock identification studies.

11. SOUTH FORK KOYUKUK RIVER ESCAPEMENT STUDY
(Conducted by U.S. Fish and Wildlife Service)

a. Location: The South Fork Koyukuk River (near confluence of Fish Creek).

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

c. Results: The preliminary sonar-estimated escapement to the South Fork Koyukuk River in 1990 was 21,081 fall chum salmon for the period July 25 through September 30. Although most salmon were oriented nearshore, the preliminary estimate is considered conservative as counts do not include fish passing in the mid-stream unensonified zone. Further, fish were present before and after sonar equipment was in operation. The 1990 run was bimodal in nature.

A total of 18 chum salmon were tagged with radio transmitters and 11 were located in the spawning grounds.

Preliminary results from aging vertebrae reveal overall age composition of the 1990 South Fork Koyukuk River fall chum salmon run to be approximately 2.7% age 3 fish, 4.1% age 4 fish, 66.7% age 5 fish, and 26.5% age 6 fish. Fall chum salmon samples were also

collected for subsequent analyses in support of on-going genetic stock identification studies.

12. CHENA RIVER ESCAPEMENT STUDY
(Conducted by the Sport Fish Division)

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

b. Objectives: Determine magnitude of chinook salmon escapement to this 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 as well as potential egg deposition.

c. Results: An electrofishing boat was used to mark 314 chinook salmon in early August. A total of 812 chinook salmon carcasses were examined in mid-August, of which 52 were marked. The estimated spawning population was 5,603 fish; 2,633 females and 2,970 males. The dominant age classes were 1.4 for females (36%) and 1.2 for males (25%). The peak aerial count of chinook salmon was 1,436, representing 26% of the mark-and-recovery point estimate. Potential egg deposition for the 1990 escapement was estimated at 24.69 million eggs.

13. SALCHA RIVER ESCAPEMENT STUDY
(Conducted by the Sport Fish Division)

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

b. Objectives: Determine magnitude of chinook salmon escapement to this 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 as well as potential egg deposition.

c. Results: An electrofishing boat was used to mark 594 chinook salmon in early August. A total of 1,322 chinook salmon carcasses were examined in mid-August of which 80 were marked. The estimated spawning population was 10,728 fish (standard error = 1,405) with a male to female ratio of approximately 1 to 1. The dominant age classes were 1.4 for females (36%) and 1.3 for males (19%). The peak aerial count of chinook salmon was 3,744, representing 35% of the mark-and-recovery point estimate. Potential egg deposition for the 1990 escapement was estimated at 52 million eggs (standard error = 2.7 million).

14. CHATANIKA RIVER ESCAPEMENT STUDY
(Conducted by the Sport Fish Division)

a. Location: Approximately rivermile 25 Chatanika River (Tanana River drainage).

b. Objectives: Major objective was to enumerate upstream migrating whitefish. However, all species passed were enumerated.

c. Results: A picket weir was in operation from July 8 - 11 and from July 20 - 28. A total of 262 summer chum salmon and 56 chinook salmon were enumerated during dates of operation. Counts are minimal as high water prevented the weir from being operated between July 11 and 20.

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: It was not possible to obtain a herring biomass estimate based on aerial surveys due to turbid water conditions during 1990. Evaluation of herring spawn deposition, test fishing data, and age composition data from test and commercial catches resulted in a post season herring biomass of 4,500 st. Department test fishing was conducted from May 17 to June 6. A total of 2,220 herring were caught, of which 1,122 samples were taken for biological data. A sample of 308 herring was taken from the commercial catch. Age 9 and older herring comprised 40% of the biomass. Recruits, age 3, 4, and 5 herring, represented 9% of the biomass. Ground surveys indicated spawn deposition occurred from May 19 until at least termination of the project. Spawn deposition appeared to be greater than what was observed in 1989.

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