ANNUAL MANAGEMENT REPORT FOR THE SUBSISTENCE AND COMMERCIAL FISHERIES OF THE KUSKOKWIM AREA

1996

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Regional Information Report[1] No. 3A98-11

Alaska Department of Fish and Game
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April 1998

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OEO/ADA Statement

ACKNOWLEDGMENTS

Many people contributed toward the collection and processing of the data used in this report. Alaska Department of Fish and Game employees worked long and irregular hours at various locations throughout the Kuskokwim Area collecting the data presented in this report. We thank Jon Rabley, Doug Bue, Larry Du Bois, Jennifer Chris, Richard Chapell, Stephen Blanchett, Alan Wintersteen, Allen Gloro, Susan McNeil, Mary Sattler, Donna Elliot, Jeremy Woods, Robert Stewart, Gary Knuepfer, Marianne Profita, Eddie Chris, Philip Perry, Dave Vozka, Joe Whittom, Chris Schmierbach, Lydia Olympic, Paul Salamone, and Mike Konte. In addition, we would like to recognize Valarie Bjornstad, Glenda Schmierbach, and Dolly Venes, the volunteers in the Kuskokwim Area. They provided valuable assistance by helping complete projects that were not funded. A special thanks goes to Bobbi Fisher, Fish and Game Administrative Clerk III, for compiling and proofreading this report. Salmon processors contributed data, communications, transportation, and advice. We gratefully acknowledge the subsistence and commercial fishers who voluntarily provided their time, skill and knowledge. The department is very grateful to Robert Sundown and his staff from the Association of Village Council Presidents, Angela Morgan and her staff from the Kuskokwim Native Association, Anthony Caole and his staff from the Native Village of Kwinhagak, the students and staff of the Takotna Community School and the Bering Sea Fisherman's Association. Their participation in cooperative assessment projects provided welcome assistance and information important for management of the fishery. The Yukon Delta National Wildlife Refuge (United States Fish and Wildlife Service) provided meeting space and advice. The Togiak National Wildlife Refuge provided assistance with escapement monitoring in Goodnews Bay.

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PREFACE

This report is one of a series of Annual Management Report detailing the management activities of the Division of Commercial Fisheries Management and Development staff in the Kuskokwim Area. The 1960-1974 management reports for the "Kuskokwim District" appear in the Arctic-Yukon-Kuskokwim Area report series. The 1975-1986 management reports appear in the Kuskokwim Area Annual Report series. The Annual Management Report became a part of the Regional Information Report Series in 1987.

Data presented in this report supersede information found in previous management reports. This report includes summary data from many research projects. Complete documentation of these projects and results appear in separate reports. The bibliography includes both referenced and unreferenced reports concerning the Kuskokwim Area fisheries. Some of the data presented are preliminary and may be presented with minor differences in future reports.

To simplify use of this report, the tabular data are separated into current year tables and appendices. The appendices are separated by fishery and fishing district. The appendices show annual comparisons and information that seldom change.

The ages of fish in this report are presented as both total age, year spawned to year recorded and in the European notation. In the European system the number of winters in fresh water after hatching is followed by the number of winters in salt water. The fresh and salt water winters are separated by a decimal point. To derive total age from the European system you must add the fresh and salt water winters and add one for the year of spawning. For example an age-1.3 chinook salmon's total age is 5 years; 1+3+1=5.

The Division of Commercial Fisheries Management and Development (CFMD) of the Alaska Department of Fish and Game (ADF&G) is responsible for the management of commercial and subsistence fisheries in the Kuskokwim Area. This annual management report details the activities of the CFMD Division in the Kuskokwim Area in 1996.

Important subsistence and commercial fisheries in the Kuskokwim Area include herring and salmon. Other marine and freshwater finfish are harvested primarily for subsistence use. A list of indigenous fishes found in the Kuskokwim Area is provided in Appendix A.1.

PART I. SALMON FISHERY

Description of Area and District Boundaries

The Kuskokwim Area includes all waters of Alaska between Cape Newenham and the Naskonat Peninsula, plus Nunivak and St. Matthew Islands (Figure 1). Commercial salmon fishing occurs in four districts in the area:

District 1, the Lower Kuskokwim River, consists of the Kuskokwim River from a line between Apokak Slough and Popokamiut, upstream to a line between ADF&G regulatory markers located at Bogus Creek, about nine miles above the Tuluksak River (Figure 2). The downstream boundary has been in effect since 1986 and the upstream boundary was established in 1994 (Appendix A.2).

District 2, the Middle Kuskokwim River, consists of the Kuskokwim River from ADF&G regulatory markers located at the upstream entrance to the second slough on the west bank downstream from Kalskag to the regulatory markers at Chuathbaluk (Figure 3). The downstream boundary of District 2 was used for the first time in 1990 (Appendix A.2).

District 4, Quinhagak, consists of the waters of Kuskokwim Bay between the mouth of Weelung Creek (misspelled in the regulations as Wheeling) and the South Mouth of the Arolik River (Figure 4). The northern boundary was new in 1990 and the first boundary change since 1960 (Appendix A.2).

District 5 consists of the waters of Goodnews Bay (Figure 5). This boundary has been in effect since the inception of the fishery in 1968.

The letter code assigned to the Kuskokwim Area by the Commercial Fisheries Entry Commission is "W". It precedes the district number on the figures and in news releases (e.g. W-1). This helps the public differentiate between announcements for the Yukon River districts (Y) and the Kuskokwim River (W) districts.

Fishery Resources

Five species of Pacific salmon are harvested by commercial and subsistence fishers in the area; chinook or "king" salmon *(Oncorhynchus tshawytscha)*, sockeye or "red" salmon (*O. nerka*), coho or "silver" salmon *(O. kisutch)*, pink or "humpy" salmon *(O. gorbuscha)*, and chum or "dog" salmon *(O. keta)*. The Kuskokwim River drainage has the largest populations of chinook, sockeye, coho and chum salmon in the area. Pink salmon occur throughout the area with significantly larger returns on even years than on odd years. Little quantitative data on the population size of pink salmon is available because of the lack of commercial markets and interest by subsistence fishers. There are no commercial fisheries for sheefish *(Stenodus leucichthys)*, or Dolly Varden *(Salvelinus malma)* in the Kuskokwim Area. Their contribution to the subsistence fishery is not well quantified, except in the Kwethluk (Coffing 1991) and Kanektok Rivers (Wagner 1991). There is a growing sport fishery on salmon and resident freshwater fish (Jones 1995, Howe et al, 1996).

Management

Management of the Kuskokwim Area salmon fishery is complex because of the difficulty in determining run size and timing, harvesting of mixed stocks, overlapping multispecies salmon runs, allocation issues, and the immense size of the Kuskokwim River drainage (Appendix B.1). The overall goal of the Kuskokwim Area research and management programs is to manage the salmon runs for sustained yield under policies set forth by the Alaska Board of Fisheries. Information is not adequate at this time to determine the

escapement levels needed to produce maximum sustained yield. Subsistence fishing has been designated by the Alaska State Legislature and the Alaska Board of Fisheries as the highest priority among beneficial uses of the resource (A.S. 16.05.258). Management of the Kuskokwim Area commercial 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 (Appendix A.3).

Most fisheries within the Kuskokwim Area harvest salmon stocks that are several weeks and hundreds of miles from their spawning grounds. As with most mixed stock fisheries, some individual stocks may be underharvested or overharvested in relation to their abundance. It is not practical, except in a very generalized sense, to manage the stocks separately based on current knowledge.

The management objective for chinook, coho, and chum salmon in Districts 1 and 2 is to achieve desired escapement objectives (Appendix A.3) and allow for the orderly harvest of fish surplus to spawning requirements. Sockeye and pink salmon are not actively managed in Districts 1 and 2. The management objective for chinook, coho, and sockeye salmon in Districts 4 and 5 is to achieve desired escapement objectives (Appendix A.3) and allow for the orderly harvest of fish surplus to spawning requirements. Chum and pink salmon are not actively managed in Districts 4 and 5. Inseason management depends heavily on commercial catch data, test fisheries and run timing information. Run timing models predict the final escapement using the historical percentage of run passage for a particular date.

CFMD permanent full time staff assigned to the Kuskokwim Area include one area management biologist, two assistant area management biologists, two research project biologists, and one field office assistant. In addition, approximately 25 seasonal employees are hired annually to assist in conducting various management and research projects. The staff aids in the enforcement of regulations in cooperation with the Department of Public Safety, Division of Fish and Wildlife Protection (FWP). Staff have also had increasing involvement with various non-profit groups and the United States Fish and Wildlife Service to develop and operate salmon escapement monitoring projects (Table 1).

COMMERCIAL FISHERY

The Kuskokwim Area commercial salmon fishery dates back to the late 1800's. In the early years of the fishery, most of the commercial catch was sold locally for dog food. Salmon have been harvested in the Kuskokwim Area for export since 1913. The current system of fishing districts, formerly called subdistricts, began in 1960 for the Kuskokwim River and District 4 (Appendix A.2). District 5 was established in 1968. The Kuskokwim River chum salmon fishery began in 1971 with gillnet mesh size restricted to 6 inches or smaller after 25 June. In Districts 4 and 5, gillnet mesh size has been restricted to 6 inches or smaller since formal inception of the districts. In 1985, the 6-inch maximum gillnet mesh size was applied to all Kuskokwim Area commercial salmon fisheries. The directed chinook salmon fishery in the Kuskokwim River was discontinued in 1987 (Appendix A.2)

Prior to 1983, a management strategy of conservatively increasing the commercial catch harvest guidelines to establish definite trends between catch and escapement allowed development of the fishery. Since change from a harvest-guideline-based management strategy to an escapement-objective-based strategy in 1983, average harvests have increased (Appendix A.4). The only stock in the Kuskokwim Area which is a

management concern[2] is Goodnews Bay chinook salmon. The failure of Aniak River chum salmon to reach its escapement objective in 1992 and 1993 will require special management measures in the 1996 through 1998 return years to prevent the creation of a management concern.

Coho salmon are the most important species in the commercial fishery both in terms of harvest numbers and value to the fishers. The commercial fisheries in all four districts target coho in late July and August. Chum salmon are second in importance being the target species in the Kuskokwim River fisheries in June and July. Sockeye salmon are the third most commercially important species with directed fisheries in Districts 4 and 5. Chinook catch and value ranks fourth with the only directed commercial fishery on this species occurring in District 4. Pink salmon are the least numerous and least valuable species in the commercial fishery.

Public Communications

Communicating management plans and decisions to the public is often challenging because many people in the Kuskokwim Area speak only Yupik or English as a second language. Special regulation notices are broadcast over local radio stations, VHF and CB radio in English and Yup'ik. The department and the Kuskokwim River Salmon Management Working Group (Working Group) relationship has dramatically improved the acceptance and understanding of many users. The department participates in school and workshop programs in the winter. News releases are now much more widely distributed through a computerized FAX and e-mail system.

Commercial Fishery Data

Catch per unit of effort (CPUE) is used in this report to describe the relative success of fishing and as an index of abundance. Commercial CPUE is catch during a fishing period divided by the product of the number of unique CFEC permits used in a fishing period and the total number of hours the district was open to commercial fishing. Commercial CPUE equals catch per permit-hour in this report.

Computer tabulations of fish tickets provide the commercial catch data presented in this report. The computer software program is a statewide system provided by the CFM&D Computer Services section.

The commercial fishery has expanded during the last 10 years (Appendix A.6). This expansion is due to increased participation by individual fishers and improvements in fishing gear, tendering, and processing capabilities, and a shift to escapement based management. In 1995, a record 829 of the 840 permit holders made at least one landing (Appendix A.5). Since 824 permit holders fished in 1989 and 1990, the number of active permits had declined slightly until 1995 (Appendix A.5). Kuskokwim Area permit holders have unrestricted movement between commercial fishing districts.

Appendix A.6 shows that permit-hours peaked in 1975; probably due to the impending limited entry permit moratorium. Since that time, maintaining adequate subsistence harvests and average spawning escapements

[2] A management concern is a stock which fails to reach its escapement objective despite repeated proactive management measures.

required reductions in fishing time. Fishing efficiency has increased, as the increase in harvest (Appendix A.4) and the decrease in permit-hours (Appendix A.6) shows. Improved run strength, escapement based management, and increased participation resulted in permit-hours stabilizing around 100,000 from 1987 to 1995 (Appendix A.6). In 1996, permit-hours were down considerably in all districts because of lower participation caused by low prices and extremely short openings due to limited processor capacity.

Commercial fishing regulations set maximum gillnet specifications of 6-inch or smaller mesh, 50 fathoms in length and 45 meshes in depth for all districts. Fishing periods in Districts 1 and 2 are usually six hours in duration from 1:00 p.m. until 7:00 p.m., as required by the management plan. Longer fishing periods generally divide the extra time before 1:00 p.m. and after 7:00 p.m. In Districts 4 and 5 fishing periods are normally 12 hours in length. Fishers prefer daylight fishing hours so the periods are normally 9:00 a.m. until 9:00 p.m.

Adjustments of the number and duration of commercial fishing periods and time intervals between periods are the primary methods of distributing the harvest throughout the run. This helps to avoid overharvesting discrete stocks, achieve biological escapement goals (BEGs), and allows sufficient fishing time for the subsistence fishery. In 1996, commercial fishing periods varied between 1.5 and 12 hours in length depending on the district, species, effort, run magnitude and processing capacity. Run magnitude is assessed by commercial and subsistence catch data and by various department, non-profit organization, USFWS and industry sponsored projects.

Kuskokwim Area fishers owned 97% of the commercial permits in 1996 (excluding educational permits held by local schools) while non-local Alaskan residents owned 2% (18). Only 6 permits are owned by non-residents (Table 2).

Escapement Monitoring and Assessing Run Abundance

The strategy used to manage Kuskokwim Area salmon fisheries began a transition in 1984 from an approach based on guideline harvest levels to a plan (ADF&G 1985) that emphasized spawning escapement objectives. Some of the major spawning systems received provisional escapement objectives in 1983. Most of these were "index" objectives established with information from aerial surveys conducted during peak spawning abundance; such objectives do not represent the entire spawning population. In a few instances objectives were developed for weir, tower and sonar projects which are intended to approximate the entire spawning population. All of the escapement objectives are derived from average historical escapement estimates (Buklis 1993). These objectives have more recently been described as biological escapement goals (BEGs). The BEGs are considered the minimum escapement levels needed to maintain salmon stocks at past levels of abundance. Continued evaluation of the escapement data provides for periodic refinements to the BEGs, but most are still based on aerial surveys (Appendix A.3).

The vast size, remoteness and fluvial diversity of the Kuskokwim Area presents tremendous challenges to assessment of salmon escapements. Aerial spawning ground surveys have been the most cost effective means of addressing these challenges. Such surveys are conducted in clear water streams and lakes, some of which serve as "index" streams as described above. The distribution of the these clear water systems is geographically skewed towards tributaries of the lower Kuskokwim River and coastal streams (Appendix B.2). The middle and upper Kuskokwim drainage tributaries are typically dark water or glacial streams with

chronically poor water clarity. Even within the clear water systems, aerial surveys are best applied to chinook and sockeye salmon which are more visible on the spawning grounds than other species. Chum salmon make greater use of the lower reaches of streams where visibility is usually poorer.

Most aerial surveys are conducted during a window of time from late July through early August when chinook, sockeye and chum salmon are thought to be at peak abundance on the spawning grounds. Weather and water conditions typically allow only a fraction of the index streams to be surveyed each year and each stream is usually surveyed only once per season. The Kanektok River, in Kuskokwim Bay, is an exception in that it is usually surveyed in mid to late June to assess early abundance levels of chinook salmon, then a second survey in late July during peak spawning abundance of both chinook and sockeye. The purpose of the early survey is to provide managers with information on which to base the District 4 chinook directed commercial fishery. Efforts are made to survey streams in September to assess coho escapements, but weather and water conditions seldom allow for effective viewing.

In addition to aerial surveys, Kuskokwim River spawning ground escapements are monitored at Kogrukluk River weir, Aniak River sonar, George River weir and towers on the Kwethluk and Takotna Rivers. Kogrukluk River weir has been operated by the department since 1976 and the project monitors passage of chinook, sockeye, chum and coho salmon (Cappiello and Burkey 1997). The BEGs for chinook, churn and coho salmon are 10,000, 30,000 and 25,000 fish, respectively. Sockeye are incidental at the site and do not have a BEG. Travel time for chum and coho salmon from the upper end of District 1 to the weir is about 20 to 25 days based on tagging studies conducted in the late 1960's (ADF&G 1961, 1962 and 1966). Inseason escapement projection models have been developed for the Kogrukluk project to provide more timely estimates of the final escapement, but their usefulness has been limited because of the long travel time between the commercial fishery and the weir. Historically, a counting tower and an unsuccessful weir project were operated on the Kogrukluk River prior to the current weir project (tower: Yanagawa 1972a, Yanagawa 1973, Kuhlmann 1973, Kuhlmann 1974, Kuhlmann 1975, Baxter 1976, Baxter 1977; weir: Yanagawa 1972b).

The department began a sonar project on the Aniak River in 1980. The Aniak River is thought to be one of the largest producers of chum salmon in the Kuskokwim drainage with a BEG of 250,000 fish. The annual operating period is usually limited to a span of about five to six weeks when the majority of chum salmon passage occurs. Although the sonar counts include a mix of species, the numbers of chum salmon are believed to significantly dominate during the normal operating period, so the sonar counts are not apportioned to species (Schneiderhan 1989, Vania and Huttunen 1997). Through 1995, non-configurable sonar equipment was used and passage in an unensonified section of the channel profile was estimated. In 1996 the equipment was upgraded to make use of configurable sonar technology and the deployment site was moved to a location that allowed full ensonification of the channel profile (Vania and Huttunen 1997). The BEG of 250,000 fish has been carried forward to the redesigned sonar project, but it will be reassessed as more information if gathered using the new design.

The escapement projects on the George, Kwethluk and Takotna Rivers were operated as cooperative ventures with Kuskokwim Native Association, AVCP, and Takotna Community School, respectively. These groups received federal funding through a grant obtained by the Bering Sea Fishermen's Association (BSFA). The department and USFWS worked jointly to provid varying levels of support to each project ranging from an on-site crew leader to equipment and technical guidance. The 1996 season was the first year of operation for the George River weir and the Kwethluk River tower. Initial development of the Takotna River tower began in 1995 after a substantial portion of the salmon runs had already passed. In 1996, the Takotna project was

begun earlier in the season to more fully assess total salmon passage. The George, Kwethluk and Takotna Rivers were selected for assessment projects with the intention of improving the distribution of escapement inventories within the Kuskokwim River drainage. The projects were operated through much of the chinook and chum seasons. The occurrence of sockeye salmon was minimal. The George and Kwethluk River projects were intended to continue into the coho season, but high water levels ended operations prematurely. Takotna River tower was only intended to operate for the chinook and chum salmon runs due to site and crew limitations. All of these cooperative projects are scheduled to run again in 1997, but long term plans are tenuous due to the instability of funding. None of these streams have BEGs applicable to the entire spawning populations. Historically, weir and sonar projects have been attempted in other Kuskokwim River tributaries but were discontinued due to funding shortages, the lack of local support, or technical limitations (Kwethluk River: Schneiderhan 1979, Harper *in press*; Kasigluk River: Schneiderhan 1980; Tuluksak River: Harper 1995a, 1995b, 1995c; South Fork Salmon River: Schneiderhan 1982a, 1982b).

The Kanektok River is the primary spawning stream in District 4, and aerial surveys are the only means currently employed to assess spawning ground escapements. A counting tower was initiated in the lower Kanektok River in 1996, but counts were only completed for a few days due to supply shortfalls and high water conditions. The project was a cooperative venture similar to those operated in the Kuskokwim River. The cooperating groups included Quinhagak IRA, BSFA, AVCP ADF&G and USFWS. The tower project is expected to be funded in 1997. The BEG's described for the Kanektok River in Appendix A.3 do not apply to the entire spawning populations. Counting towers and sonar projects have been attempted in Kanektok River in past years, but they have all been discontinued due to site limitations and technical obstacles (tower: ADF&G 1960, 1961 and 1962; sonar: Schultz and Carey 1982, Schultz and Williams 1984, Huttunen 1984, 1985, 1986, 1988).

In District 5 the primary salmon spawning stream is the Goodnews River. Escapement is assessed in the drainage by means of a weir on the Middle Fork Goodnews River and by aerial surveys (Figure 1). The weir is located about 15 miles from the eastern boundary of the commercial fishing district. The proximity allows for timely escapement assessment for effective inseason management. A fixed picket weir has been operated on the river since 1991. It was preceded by a counting tower that operated from 1981 through 1990 (Burkey 1990). The weir and tower projects monitored passage of chinook, sockeye and chum salmon. The BEGs are 3,500, 25,000 and 15,000 fish respectively. Postseason, estimates are made of the salmon spawning populations for the entire Goodnews drainage by multiplying the weir passage by the proportion of fish seen during aerial surveys in the Middle Fork Goodnews River relative to the entire drainage (Appendix D.1). Assessment of coho escapement on the Middle Fork Goodnews River has not been successful because of funding limitations and poor operating conditions during the coho run. Plans are underway to replace the fixed picket weir with a floating weir design which is expected to allow for operation during coho season. Fabrication of the floating weir is a cooperative venture between ADF&G, USFWS, and BSFA.

Except for District 5, inseason spawning ground escapement estimates for use by management are difficult to obtain in the Kuskokwim Area. In District 4, timely estimates have been limited to an occasional aerial survey. Consequently, inseason management in District 4 emphasizes the use of commercial catch data. Both inseason and postseason assessments of the impact of management on escapements is very limited in District 4. In the Kuskokwim River most spawning streams are many miles upstream of the commercial fishing districts, so there is a long delay between commercial fishing periods and the observed fish passage at escapement projects. The delay is typically too late to effectively adjust fishing effort during the early part of the season. Therefore, inseason salmon management on the Kuskokwim River depends primarily on commercial catch information and the Bethel test fishery. The escapement projects allow some inseason and

postseason assessment of management actions. With the advent of the new cooperative projects, the distribution of escapement monitoring is much improved and, if continued, will lead to better assessment of management decisions and the distribution of escapements.

When using commercial harvest information managers compare current year commercial CPUE with historical data in order to provide an inseason assessment of run strength. However, the usefulness of this approach can be confounded by inconsistencies in the number of participating fishers, the duration of commercial fishing periods and other variables that might influence catch or the actual "effort" applied by fishers. The practicality of this approach is also limited by the need to have a commercial fishing period in order to make an assessment.

Daily inseason assessment of run strength and timing is also available from a drift gillnet test fishery operated on the Kuskokwim River. The department's Bethel test fishery (river mile 80) began in 1984 and has been the oldest operating and most useful test fishery in the area. Historically, other test fisheries have been attempted: Kwegooyuk test fishery, 1966 - 1983 (Baxter 1970, Huttunen 1984); Eek test fishery, 1988 - 1994 (unpublished); Lower Kuskokwim River test fishery, 1995 (unpublished); Aniak test fishery, 1992 - 1995 (unpublished); Chuathbaluk test fishery, 1992 - 1993 (unpublished); Kuskokwim River subsistence test fishery, 1988 - 1990 (Kuskokwim Fishermen's Cooperative 1991), but these projects were discontinued due to a variety of shortfalls. Even the Bethel test fishery, which is operated quite rigorously, has a number of confounding influences which limit the projects' usefulness (Molyneaux 1997).

The department began developing a configurable sonar project in 1988 for deployment in the main stem of the Kuskokwim River near Bethel (Mesiar et al. 1994). That project became operable in 1993, but shortages in technical support and the restructuring of the Regional sonar program precluded operation of the project after 1995. The Kuskokwim River sonar project is schedule to restart within the next few years as part of the Regional sonar rebuilding program. An outgrowth of the sonar project on the Kuskokwim River was the development of a "sustained yield scenario" (Burkey et al 1996). The scenario included a drainage wide spawning escapement goal of 506,000 chum salmon based on a 2:1 return per spawner and 1983-1992 median chum salmon harvest (commercial and subsistence) of 506,000.

SEASON SUMMARY

The 1996 Kuskokwim Area salmon season opened by emergency order in District 1, on 17 June. The salmon season closed by regulation on 8 September following the final fishing period on 26 August.

Declining salmon markets, particularly for chum salmon flesh, had a major impact on the fishery which resulted in limited harvests and lower exvessel values. Poor market conditions resulted in reduced processing capacity which limited the fishing time. Inlet Salmon, the Kuskokwim Area's largest processor, filed for Chapter 11 bankruptcy protection in 1995. The area's second largest processor, Whitney Seafoods, completely withdrew from the Alaskan salmon market after the 1995 season. Despite intensive recruitment efforts by the state and private organizations, no other major processors committed to purchasing salmon in the Kuskokwim Area during the chum season (Table 5).

Prior to April, it was uncertain if Inlet Salmon would operate in the Kuskokwim Area. Eventually, they were successful in continuing their Bethel operations by forming a new company, Inlet Fish Producers. As part

of a severe cost cutting program, Inlet Fish Producers' processing and tendering capacity in 1996 was approximately half Inlet Salmon's 1995 operations.

Commercial salmon sales in 1996 were below the most recent 10-year average (1986-1995), with the exception of coho salmon sales. In 1996, a total of 1,537,030 salmon in the round and 6,453 pounds of unprocessed salmon roe were sold in the Kuskokwim Area. The catch was composed of 22,513 chinook, 121,894 sockeye, 1,098,064 coho, 1,663 pink and 292,896 chum salmon in the round (Table 4). In addition, 388 pounds of chinook roe, 798 pounds of coho roe and 5,267 pounds of chum roe were sold (Table 3). The total estimated commercial harvest including the estimated harvest to produce roe sold was 22,959 chinook, 122,260 sockeye, 1,099,865 coho, 1,663 pink and 301,975 chum salmon (Appendix A.4). The 1996 estimated salmon harvests compared to the recent 10-year averages were as follows: chinook, 60% below, sockeye, 28% below, coho, 75% above, pink, 97% below[3] and chum 50% below average (Appendix A.4). The commercial harvest of coho was a record high for the Kuskokwim Area.

The department sold 247 chinook, 623 sockeye, 3,013 coho, 19 pink and 2,864 chum salmon from the Bethel test fishery. These fish were not included in the commercial sales.

In 1996, 713 of the 840 Kuskokwim Area permit holders made at least one landing (Appendix A.5). Commercial fishing effort, measured by permit-hours, was the lowest since 1972 and only 64% of the most recent 10-year average (Appendix A.6).

The average prices paid per pound were extremely low (Appendix A.7). Chinook salmon were worth an average of $0.26 per pound, $0.51 below the 10-year average and the lowest price since 1973. Likewise, sockeye salmon were worth $0.40 per pound which was $0.52 below average and the lowest price since 1980. The price for coho salmon of $0.25 per pound was $0.38 below average. It was also the lowest price paid to fishers since 1972. Pinks brought $0.12 a pound, $0.01 above average. The $0.11 per pound paid for chum salmon was $0.17 below average and the lowest since 1973. Average price per pound paid for salmon roe was: chinook, $2.51, coho, $2.00, and chum $2.59.

Kuskokwim Area permit holders received $2,900,613 for their catch, excluding bonuses and other incentives not reported on fish tickets. Salmon buyers and processors operating in the Kuskokwim Area during 1996 are listed in Table 3. The value of the catch was 49% below the previous 10-year average of $5,634,409 (Appendix A.5). The average permit holder earned $4,068 from the commercial salmon harvest in 1996. This was 41% below the 10-year average of $6,952 per permit holder.

Weak chum salmon markets limited the processing capacity available in the Kuskokwim Area in 1996. All Kuskokwim Area fisheries were significantly impacted. During June and early July, managers restricted the duration of openings in the Kuskokwim River to 2 hours or less to avoid exceeding processing capacity (Table 6). Fishers in District 2 were substantially impacted (Table 7). In June and July the lone processor operating in District 2 purchased only salmon roe. The District 2 processor did not operate in August, and fishers had to transport their catches to District 1 to find a buyer. In late July additional processing capacity became available for the coho season and the length of the fishing periods reverted to the more normal 6-hour duration. In past years, 8-hour periods have also been allowed (Table 6), but only one occurred in 1996.

[3] Even years only.

In District 4, fishing time was reduced due to lack of processor interest in chinook salmon and reduced tendering capacity. Reduced tendering capacity also limited the number of fishing periods in District 5.

Permit-hours were well below average in all districts due to shorter than normal openings during the chum salmon fishery (Appendix A.6). Unless otherwise noted, the harvest estimates below include fish sold in the round plus the estimated number of fish caught from which only roe was sold.

Kuskokwim River (Districts 1 and 2)

The Working Group, comprised of representatives from several Kuskokwim River salmon user groups, continued to work closely with the department in 1996. Through uncommon dedication by all the concerned parties, the Working Group provided inseason management recommendations that served as a cooperative approach to management of the Kuskokwim River salmon fisheries (Table 8). During the season the Working Group met 16 times to evaluate the status of the salmon runs and make recommendations to the department.

The 1996 preseason outlook was for a below average chum salmon run due to expected low returns to the Aniak River, believed to be one of the largest chum salmon producers in the Kuskokwim River drainage. The return of five year old fish, spawned in 1991, was expected to be average based on their return as age four salmon in 1995. However, the return of four year old chum salmon from the 1992 escapement was expected to be below average in abundance based on the weak parent year escapement. As a result of this low escapement, the Aniak stock was expected to have no harvestable surplus in 1996. Escapement was assumed to be adequate in most other Kuskokwim River tributaries in 1992. Adequate escapements in the rest of the drainage were expected to result in normal returns to those systems in 1996. The preseason projected harvest for the Kuskokwim River commercial fishery in 1996 was 100,000 to 300,000 chum salmon (Burkey, et al 1997).

At a 22-23 March Working Group meeting, Inlet Salmon requested Working Group approval of a management plan that called for the department to consider two or three openings between 17 June and 24 June with a harvest limit of 400,000 pounds per period. This plan was to take effect if Inlet Salmon was the only major processor operating on the Kuskokwim River. The plan was designed to provide chum salmon to the early summer fresh fish market by harvesting early running upriver (above the Aniak drainage) chum stocks. These stocks were expected to produce a harvestable surplus based on adequate parent year escapements to streams above the Aniak drainage. As always, commercial openings would be dependent on adequate chinook and chum salmon run strength. The Working Group voted to approve the management plan.

One notable feature of this year's fishery was the extremely early timing of the salmon migrations in the Kuskokwim River. The Bethel test fishery CPUE provides a good estimate of the migration rate of salmon passing Bethel. The midpoints of the chinook, chum and coho migrations in the Bethel test fishery were the earliest since the project's inception in 1984. The chinook migration midpoint of 14 June was 8 days earlier than the historical median of 22 June (Appendix B.4). The sockeye migration midpoint was 24 June, 3 days before the 27 June median, making it the third earliest run since 1984 (Appendix B.6). The midpoint of the chum run was 23 June, 9 days earlier than the 2 July median (Appendix B.8). The midpoint of the coho run was 29 July, 11 days earlier than the historical median of 9 August (Appendix B.10).

There were nine commercial fishing periods in District 1 during the chum salmon season (Table 6). District 2 had seven openings (Table 7). A total of 207,877 chum salmon were harvested by 599 permit holders. The catch was 56% below the most recent 10-year average harvest for Districts 1 and 2 (Appendix B.11). The average price per pound for chum salmon was $0.12 making the exvessel value of the catch worth $183,106 (Table 4). The incidental harvest of 7,419 chinook and 33,878 sockeye was well below average because of the reduced fishing time, low effort levels and (for chinook) early run timing.

The number of permit holders participating by period in the District 1 chum salmon fishery ranged from 194 to 283 (Table 6). This was well below the 400-700 permit holders that normally fish District 1 during the chum season (Appendix B.8). The decreased participation was due to the short openings, low prices and lack of tenders. In June, the number of tenders and the area they covered was greatly reduced from previous years and many fishers had to travel unusually long distances to sell their catch. During commercial openings from 2 July through 19 July, there were few if any tenders available and most fishers were forced to deliver at Bethel.

With one exception, all openings during the commercial chum salmon fishery were 2 hours in length instead of the more typical 6 or 8 hours (Table 6). Fishers in District 2 had three 2-hour and four 4-hour periods during the chum season (Table 7). The shorter periods were necessary because of limited processing capacity and the need to improve the quality of the catch. The reduced duration of fishing periods and the low effort levels confounded comparisons of current year and historical commercial catch statistics, particularly CPUE, to evaluate run strength.

Run assessment through mid-June showed good chum salmon abundance. At the 15 June Working Group meeting, the department announced that District 1 would open to commercial fishing on 17 June for 2 hours. A survey of processors showed that a harvest limit of 200,000 pounds per opening was required so as not to exceed available processing capacity. Based on historical catches, it was determined that a 2-hour opening was appropriate to prevent the harvest from exceeding processing capacity. In compliance with 5 AAC 07.365 KUSKOKWIM RIVER SALMON MANAGEMENT PLAN this first period only included the lower half of District 1. The upper half of District 1 and all of District 2 remained closed. The entire length of District 1 was open during the next two periods; a 2 hour opening on 20 June and a 1.5 hour opening on 24 June. The harvest of chum, chinook and sockeye salmon was well below historical catches that occurred near their respective dates. The below average catches were attributed to the reduced hours fished and low effort levels. Staff agreed that the reduction in fishing hours and effort was allowing a sufficient number of chum salmon to pass through the commercial fishing district through 24 June.

The Kuskokwim River was closed to commercial fishing from 25 June through 1 July in order to protect Aniak River chum stocks. Based on fish swimming speeds, significant numbers of Aniak chums should be present in the Kuskokwim River from late June through mid-July. The closure was necessary because adequate assessment of chum escapement into the Aniak River was not possible before 1 July.

On 1 July, run assessment indicated that the early portion of the chum run appeared strong and that the chum salmon escapement goal into the Aniak River was being achieved. The Working Group and the department agreed to reopen the commercial fishery in Districts 1 and 2 for 2 hours on 2 July and again on 5 July with the period length to be determined based on available processing capacity.

For the remainder of the chum salmon season, run strength indicators showed that the chum salmon run was adequate to provide for escapement, subsistence and a below average commercial harvest. Five 2-hour fishing periods occurred between 2 July and 16 July (Table 6). In all instances the short hours were a result of the limited processing capacity. Fishing time was increased to 3 hours for the 19 July period based on the declining salmon catches. The Kuskokwim River coho salmon season began after coho outnumbered chum salmon in the 19 July catch.

The first commercial fishing period in District 2 occurred on 24 June. The single processor operating in the district bought only salmon roe. Following the 24 June opening, the number of permit holders in District 2 dropped from 6 to an average of 3 per period for the balance of the chum salmon season (Table 7). During the chum season, sales of salmon flesh were limited to less than 100 fish bought locally from one catcher-seller. Low prices, the extra work associated with extracting roe for sale and the difficulty of utilizing large numbers of unmarketable salmon carcasses made fishing unprofitable for many District 2 permit holders. The processor ceased operations on 31 July.

In mid-July the processing capacity in the Kuskokwim River salmon fishery increased. Based on the strength of the coho salmon run, the department and the Working Group agreed to reopen the commercial fishery on 22 July for 6 hours in Districts 1 and 2. The strong coho catches and increased fishing time helped boost participation to near average historical levels (Appendix A.8). The number of permit holders fishing in District 2 continued to be less than one quarter historical levels due to the lack of a buyer in the district (Appendix A.8).

The department recommended a total of 12 fishing periods in District 1 (Table 8) during the 1996 coho salmon season. The Working Group agreed with the department's recommendations. Extremely high coho abundance, coupled with improved processing capacity, allowed for eleven 6-hour and one 8-hour commercial fishing periods. The Kuskokwim River was closed to commercial fishing after the last period on 26 August. The coho salmon catch was a record 930,131 fish taken by 619 permit holders (Table 6).

Chinook Salmon

The combined commercial and subsistence chinook salmon harvest has increased from an average of 56,000 fish from 1960-1969 to 114,000 during 1986-1995 (Appendix B.13). A conservation concern for Kuskokwim River chinook salmon arose following a series of years with poor chinook salmon escapements in the mid 1980s (Figure 6). Besides the poor escapements, the low number of female chinook salmon in the escapement, as indicated by the Kogrukluk River weir, compounded the conservation concern (Cappiello and Burkey 1997).

Beginning in 1984, the Board began restricting the commercial fishery because the department was unable to correct the problem through inseason management measures. In 1985, a shift to 6-inch or smaller commercial gillnets reduced the harvest of larger female chinook salmon. This gear change was successful in reducing the sex ratio of the commercial catch from 43% to 29% female (Molyneaux and DuBois 1996). However, total escapement continued to be below acceptable levels (Figure 6). To provide for the subsistence harvest and maintain average spawning escapements the directed commercial harvest of chinook salmon was prohibited in 1987. This action resulted in improved chinook salmon escapements in subsequent years (Figure 6). An unexpected benefit of the improved status of chinook salmon in the Kuskokwim River, coupled with the 6-inch maximum gillnet mesh size restriction, was an increase in the commercial harvest

of male chinook salmon (Molyneaux and DuBois 1996). The subsistence fishery continues to target large chinook salmon with "king" gear. Improved survival, perhaps related to elimination of the directed high seas salmon fishery, played a role in the success of these management changes.

Since 1987 the chinook salmon catch has been incidental to the chum salmon fishery in Districts 1 and 2. In 1996 the commercial harvest of 7,419 was well below the recent 10-year average of 34,873 (Appendix B.11). This is due primarily to the early run timing and short commercial openings. The exvessel value of the chinook harvest was $24,646, well below the recent average of $340,952 (Table 4).

Chinook salmon escapement goals were achieved at the Kogrukluk River weir (Appendix A.9) and in two of the three aerial survey index streams flown in 1996 (Table 9 and Appendix B.2). The strength and early timing of the chinook run and shorter openings produced the fourth highest escapement index on record (Figure 6). The Bethel test fish index for chinook salmon was the fourth highest on record, suggesting average to above average run strength (Appendix B.3).

Sockeye Salmon

The sockeye salmon catch is incidental to the chum salmon fishery in Districts 1 and 2. Before 1981, sockeye and chum salmon were not accurately differentiated in commercial or subsistence catches. This prevented an accurate record of the sockeye and chum salmon harvests in the Kuskokwim River. Sockeye salmon comprised 5 to 33% of the combined sockeye-chum salmon catch since 1981. Before 1981, the reported sockeye salmon catch was less than 2% of the sockeye-chum salmon catch (Appendix B.11). In 1996 the commercial harvest of 33,878 sockeye was below the recent 10-year average of 82,171 (Appendix B.11). The exvessel value of the catch was $97,176, only 20 % of the recent average value of $480,007 (Table 4).

Sockeye salmon escapement is documented ancillary to the other species. The Kogrukluk weir escapement estimate of 15,381 sockeye salmon in 1996 was well above average (Appendix A.9). The Bethel testfish index for sockeye salmon was the third highest on record (Appendix B.5), indicating above average run strength .

Chum Salmon

Before 1971, chum salmon were an incidental catch during the chinook and coho directed salmon fisheries. The expansion of the commercial chum salmon fishery began in 1971. Based on the 1924-1943 subsistence harvest estimates, a total chum salmon harvest of 400,000 appeared to be consistent with the reproductive potential of the run (Appendix A.4). A combined commercial and subsistence catch of 400,000 chum salmon was the management goal from 1971 to 1979. Subsistence catches for the entire river have declined since the inception of the commercial fishery in 1971 (Appendix B.14). From 1971 to 1980 the average subsistence harvest was 173,689. The average harvest declined to 136,206 for the period 1981 to 1990 (Appendix B.14). This is thought to be because of the decline in the use of dog teams for transportation, not the increased commercial harvest.

The commercial chum salmon harvest for the Kuskokwim River (Districts 1 and 2) has averaged 517,280 salmon in the last 10 years (Appendix B.11).

The following guidelines are used to manage the commercial harvest:

1. Chum salmon run assessment projects indicate that escapements will be adequate.

2. Commercial catch per unit of effort compares to previous years when escapement was adequate.

3. Subsistence fishers report adequate subsistence catches.

Declining run strength normally results in a 1 to 2 week closure beginning in the last half of July. Before 1985, only that portion of District 1 downstream of Bethel was open to commercial fishing during the chum salmon fishery. The Board instructed the department to use the entire length of District 1 beginning in 1985. Low chum escapements occurred in 1986 and 1987. Runs in 1988 and 1989 were at record high levels, but in order to reach escapement objectives more time was required between fishing periods. The 1990 and 1991 runs were smaller but a 4 to 6 day spacing between periods resulted in approaching or reaching chum salmon escapement objectives.

The Bethel test fish index for chum salmon was the highest on record (Appendix B.7) and an accurate indicator of commercial catches above Bethel. The Aniak River sonar escapement estimate for 1996 of 302,106 fish exceeded the goal of 250,000 fish (Table 10). The chum salmon escapement objective at the Kogrukluk River weir was exceeded largely due to the reduced commercial fishing time on the Kuskokwim River (Appendix A.9).

Coho Salmon

Kuskokwim River managers have a limited number of indicators of coho salmon abundance in the drainage: the Bethel test fishery, Kogrukluk River weir, commercial catch data and an informal collection of subsistence information. The Kogrukluk River weir has a coho escapement objective of 25,000 fish. Commercial catch per unit of effort in District 2 during coho season is used as an indicator of abundance of coho salmon above District 1. The CPUE in District 2 has been useful when weir data are unavailable (Figure 7).

Traditionally, coho salmon (locally called "rain fish") were not well utilized for subsistence because of poor drying conditions during rainy fall weather. Subsistence use of coho salmon has increased in areas where freezers are available to preserve fish. In recent years, Subsistence Division staff have started their surveys after coho salmon have completed migration past the upper river villages. This has probably increased the numbers of coho salmon reported over earlier years when subsistence surveys were conducted before the coho migration was complete.

Commercial fishery management in the Kuskokwim River is based on coho salmon abundance when that species dominates the commercial catch. Fishing periods are usually simultaneous in Districts 1 and 2 throughout the season which closes by regulation on September 1. Record runs in 1984 and 1994 as well as a late run in 1989 resulted in extensions of the season in those years (Appendix B.12). The management strategy during the coho season is similar to that for chum salmon.

In the previous 20 years, coho catches have ranged from 196,000 fish in 1983 to the record high harvest in 1994 of 724,689 fish (Appendix B.11). The most recent 10-year average harvest is 545,000 fish. Since 1985,

in years when both districts have had buyers, the number of permit holders that fished has ranged from 650 to 775. In 1996 a total of 623 permit holders harvested a record 937,311 coho salmon in the Kuskokwim River districts.

Since inception of the Working Group, the coho salmon BEG at the Kogrukluk River weir has been achieved in three out of the six years with adequate data. Distrust by the public of the Bethel test fishery, lag time of Kogrukluk River weir escapements, and lack of sufficient additional data contributed to the overfishing. The department's uncertainty during the early portions of the run often caused corrective actions to come too late to make a significant difference in escapement needs to the upper drainage as indexed by Kogrukluk River weir. Escapement at Kogrukluk River weir in the last few years has improved with the BEG being achieved or nearly reached.

In 1996, the Kogrukluk River weir operated for almost the entire coho migration period. An estimated 50,555 coho salmon escaped, a record high for this project, exceeding the escapement goal of 25,000 fish (Appendix A.9). The Bethel test fishery cumulative CPUE in 1996 was the highest on record (Appendix B.9).

In the last decade, when buyers have been present in District 2, commercial fishing has usually been simultaneous with District 1. Before 1996, the commercial fishing effort in District 2 had been fairly consistent and had provided a CPUE that correlated well with escapement at the Kogrukluk River weir. An average cumulative CPUE of 43 or greater for fishing periods between 1 and 21 August has resulted in the escapement goal being reached (Figure 7). The 1996 cumulative CPUE was 58, reflecting the record escapement passed the Kogrukluk River weir.

Roe Sales

In 1996, the single processor operating in District 2 bought only salmon roe. The 1989 season was the only other year that a processor registered to buy only salmon roe in the Kuskokwim Area. Roe sales began in District 2 on 24 June and continued until 31 July. Six permit holders sold 338 pounds chinook, 3,246 pounds chum and 798 pounds coho salmon roe (Table 3). In District 1, a processor bought 1,271 pounds of chum salmon roe from 17 permit holders during the 5 July and 12 July periods. Seventeen permit holders sold 750 pounds of chum salmon roe in District 4 during the 3 July period (Table 5). Commercial roe prices ranged from $2.00 to $3.00 per pound for a total exvessel value of $16,188 paid to 39 permit holders (Table 4).

All processors refused to buy stripped salmon. Therefore, in order to account for the number of salmon harvested to generate roe sales, the sex ratio of the commercial catch and the average weight of roe per female provided an estimate of how many salmon were stripped for egg sales. In District 2, many of the landings were censused by a department catch monitor in Aniak. The catch from these landings was speciated and sexed to estimate sex ratios and roe skeins were weighed to estimate average roe weight per female. Because no sockeye roe was purchased, the sockeye salmon harvest was also estimated from these samples. In Districts 1 and 4, the total harvest associated with roe sales was estimated by assuming a 1:1 male to female sex ratio and an average skein weight of 1 pound per female. Average roe weight for chum salmon in District 2 was 1 pound (range 0.8-1.1 pounds) per female.

Less than 100 of the estimated 11,800 carcasses generated from roe sales were sold. All the unsold carcasses from the District 2 fishery were used for subsistence purposes. There were several reports of wasted fish made to the department and Working Group related to the Districts 1 and 4 roe sales. In response, the

department sent a news release to the villages reminding people participating in roe sales that wasting fish and selling roe from subsistence caught fish was illegal.

Quinhagak (District 4)

District 4 is located in the marine waters adjacent to the village of Quinhagak at the mouth of the Kanektok River, about 25 miles south of the Kuskokwim River (Figure 4). Commercial fishing occurs within three miles of shore and in the tidal channels that radiate out into Kuskokwim Bay from the Kanektok and Arolik Rivers.

The District 4 Salmon Management Plan 5 AAC 07.367 requires an opening before 16 June. This district has the only directed chinook salmon fishery in the Kuskokwim Area. When chinook outnumber sockeye salmon in the commercial catch, the fishery is managed based on chinook salmon run strength. Management of the fishery is based on sockeye run strength when the commercial catch of sockeye exceeds the catch of chinook salmon.

Prior to the 1996 season, fish processors indicated that the chinook salmon market was poor. Therefore, management shifted harvest towards sockeye salmon by opening later than normal. This also contributed to a decrease in the number of permit holders participating in this district to 218 which was below the most recent 10-year average of 333 (Appendix C.1).

District 4 opened to commercial fishing on June 22 when processors became available to purchase fish. Lack of tendering capacity made it necessary to shorten and or delay most openings prior to 24 July. After 24 July the commercial fishing fleet fished a normal schedule of three 12-hour periods a week until 26 August when processors left the area (Table 11).

Commercial fishing effort in District 4 has increased considerably in the last decade (Appendix C.1). Recent changes in the Kuskokwim River June commercial fishery may have caused the effort to shift to this district. However, in 1996, District 4 had a below average effort. This may be attributable to lower fish prices and the start of the 1996 fishing season being delayed one week due to lack of processor interest.

Harvest during the 1996 season consisted of 14,165 chinook salmon, 57,665 sockeye, 81,505 chum and 118,718 coho salmon (Appendix C.2). The chum harvest was a record while coho harvest was the second highest on record for the District 4 commercial fishery. The first ever delivery of chum salmon roe was recorded during 3 July when 17 permit holders delivered 750 pounds of chum salmon roe.

The chinook salmon catch was well below the most recent 10-year average (1986-1995) of 20,081, but sockeye, coho and chum salmon catches exceeded their ten-year average. This resulted in a total salmon harvest of 273,573 fish, slightly above the most recent ten-year total of 188,230 fish (Appendix C.2).

Prices paid to fishermen this season were the lowest since the 1970's (Appendix A.7). This fishery had a total exvessel value of $535,104. Average prices per pound were: chinook $0.27, sockeye $0.40, coho $0.25, pink $0.10 and chum $0.10. Coho salmon were the most valuable species in 1996 providing 46% of this districts fishery value.

Salmon run strength for this district is usually monitored through historical commercial catch and aerial surveys. Aerial surveys documented peak counts of 6,107 chinook, 30,000 sockeye, and 23,656 coho salmon (Appendix C.3). Escapement goals were achieved for both chinook and sockeye salmon. Escapement for chum salmon is unknown due to poor aerial survey conditions during the peak escapement period. During the 1996 season a cooperative tower project was implemented. The new escapement project was a cooperative project between Quinhagak IRA, ADF&G, and USFWS. It was operational for 16 days between 3 July and 25 July.

Goodnews Bay (District 5)

The Goodnews Bay district is the southernmost salmon district in the Kuskokwim Area (Figure 5). Commercial fishing occurs within Goodnews Bay, primarily with drift gillnets in tidal channels and a few set nets near the mouth of the bay.

In 1996, District 5 opened on 28 June in order to allow increased chinook salmon escapement. Total seasonal fishing time was below average for the Goodnews Bay fleet due to a lack of tendering capacity and weather. This resulted in only 53 permit holders making deliveries in 1996. This is below the most recent 10-year average of 98 permit holders (Appendix D.2).

Because Goodnews Bay is the furthest district from processing facilities in the Kuskokwim River, it is difficult to tender fish out of the district. During the 1996 season, this coupled with limited tendering capacity, and poor weather resulted in constrained fishing periods. All fishing periods were 12 hours in length with the exception of the 7-hour opening on the first period (Table 12).

Harvest during the 1996 season totaled 1,375 chinook, 30,717 sockeye, 11,093 chum, 43,836 coho and 22 pink salmon (Appendix D.3). With the exception of the record coho harvest that was well above the 10-year average of 23,750 coho salmon, the harvest of other species was well below average. While pink salmon harvest was low due to lack of market, the district's decreased fishing time reduced harvest of chinook, sockeye and chum salmon.

The total exvessel value of the Goodnews Bay commercial catch was $222,588 (Table 4). Average prices for salmon in the district were chinook $0.25, sockeye $0.40, coho $0.28, pink $0.06 and chum $0.11. Coho and sockeye salmon were the most valuable species contributing 54% and 39% of the total value.

Escapement in this district is monitored by aerial surveys and the department's weir on the Middle Fork Goodnews River. The weir estimates were 2,930 chinook, 58,264 sockeye, 40,450 chum and 9,699 coho salmon (Table 13). Escapement of chinook salmon was below the goal of 3,500 while sockeye and chum salmon easily achieved their BEGs. Coho salmon escapement goals have not been established for this project. The coho salmon enumerated through the Middle Fork Goodnews River weir is only a partial count because the project terminates early in the run. An incomplete aerial survey was flown of the Goodnews River drainage on 6 September. This survey documented 10,334 coho salmon, but conditions were rated poor. Further aerial surveys were not flown due to poor conditions.

Enforcement

The Fish and Wildlife Protection Division of the Department of Public Safety were present in the Kuskokwim Area from early June until early September. Personnel available for this program were four commissioned and one non-commissioned officer. They used one C-185 and three Supercub aircraft and one skiff. Citations were issued for commercial fishing in closed waters, closed season or closed period, no commercial fishing or crew member license, and identification of vessels and gear.

OUTLOOK FOR 1997

The Kuskokwim Area has no formal forecast for salmon returns. Broad expectations are developed based on an evaluation of brood year escapements, trends in harvest, and apparent trends in productivity.

Chinook Salmon

Most chinook salmon return to the Kuskokwim Area at age 6, 5, or 4, so the primary brood years for 1997 will be 1991, 1992 and 1993. Chinook salmon escapement in the Kuskokwim River drainage is monitored by aerial surveys of selected streams and at Kogrukluk River Weir. A limited amount of escapement data is also available from the Tuluksak River (operated 1991 through 1994) and Kwethluk River weirs (operated 1992) which were U.S. Fish and Wildlife Service projects. In Kuskokwim Bay, chinook escapement is monitored by aerial surveys of Kanektok and Goodnews Rivers and at the Middle Fork Goodnews River weir.

Districts 1 and 2

The chinook salmon return to the Kuskokwim River in 1997 is expected to be at average or below average abundance. In 1991 chinook passage at Kogrukluk River weir was only 78% of the BEG and aerial survey objectives were achieved in 2 of 6 index streams (Figure 6, Appendix B.2). In 1992, Kogrukluk River escapement was 68% of objective and 4 of 8 aerial survey objectives were achieved. In 1993 chinook passage at the weir was 24% above the BEG and aerial survey objectives were achieved in 2 of 4 index streams.

The incidental commercial harvest of chinook salmon in the Kuskokwim River is driven by the intensity of the chum directed fishery. Commercial fishing effort is expected to be below average because of low chum salmon abundance, poor market conditions and limited processor interest, therefore the incidental chinook catch is also expected to be below average. Still, the chinook harvest may approach average levels if a proposal for a directed commercial fishery on early running chum salmon is adopted. The intent of this proposal is to allow for a normal commercial harvest of chinook and early running chum salmon with

minimal impact on the weak Aniak River chum stocks. This goal would be achieved by taking advantage of run timing differences. The proposal would allow some commercial fishing to occur in mid-June, before the expected weak mid-season chum salmon stocks begin to arrive. If the proposal is adopted, the commercial harvest of chinook salmon is expected to be between 20,000 and 45,000 which is within the central 50% of historical harvest levels. If the proposal is not accepted the harvest will likely be below 20,000 (Table 14). Given the market conditions the later scenario seems most likely.

District 4

District 4, currently has the only directed chinook salmon fishery in the Kuskokwim Area. The chinook escapement index was below objective in the Kanektok River for all three primary brood years (Appendix C.3). The harvest trend in recent years has also been below average, except for 1995. As in the Kuskokwim River, the bulk of the 1995 commercial chinook harvest in District 4 was attributed to age 6 fish. Market conditions are likely to be the limiting factor in the harvest levels of chinook salmon in District 4 during the 1997 season. Assuming conditions will be comparable to those experienced in 1996, the 1997 commercial harvest will likely be between 8,000 and 20,000 which is the lower half of the historical range (Table 14).

District 5

In District 5, the chinook stocks have been depressed for most of the past several years and a rebuilding program has been underway. Escapement to the Middle Fork Goodnews River was below objective in all three primary brood years (Appendix A.9). The harvest trend in recent years has generally been near or below average due to low returns, the impact of the chinook salmon rebuilding program and market conditions. For the 1997 season overall conditions will likely be similar to those of 1996. Consequently, the incidental catch of chinook salmon in District 5 will probably be between 1,000 and 2,500 which is in the lower quartile of the past 11 years (Table 14).

Sockeye Salmon

Sockeye salmon return to spawn primarily at age 5 in the Kuskokwim Area, so the 1992 brood year will have the most influence on the 1997 returns. In the Kuskokwim River, sockeye harvest is incidental to the directed commercial fishery on chum salmon. Districts 4 and 5 of Kuskokwim Bay both support directed sockeye fisheries.

Districts 1 and 2

Sockeye salmon are harvested incidentally during the chum directed commercial fishery on the Kuskokwim River. The return of sockeye salmon is expected to be about average in 1997. The 1992 brood year escapement at Kogrukluk River weir was near average, although Kogrukluk weir is probably not a good indicator of drainage wide production for sockeye salmon (Appendix A.9). The quantity of sockeye salmon expected to be harvested from the Kuskokwim River will be driven by the intensity of the chum fishery in

late June and early July. Given the poor outlook for the 1997 chum salmon return coupled with poor markets and limited processor interest, the incidental sockeye harvest from the Kuskokwim River will likely be comparable to the 1996 harvest; between 30,000 and 45,000, which is well below average (Table 14).

District 4

Sockeye salmon returns to District 4 are expected to be average in 1997. The 1992 brood year escapement as indexed by aerial surveys in the Kanektok River was 14,955 sockeye, which is very near the escapement objective of 15,000 fish (Appendix C.3). The 1992 return supported an above average commercial harvest of 60,929 sockeye (Appendix C.2). In the last few years the trend has been towards above average commercial harvests while still achieving escapement objectives. Even in the general downturn in the salmon market the District 4 sockeye salmon fishery drew enough interest to maintain an average harvest in 1996. Similar conditions will likely exist in 1997. The sockeye harvest in District 4 is expected to be between 20,000 and 70,000, which is within the central half of the historical harvest range (Table 14).

District 5

District 5 should also have a good sockeye return in 1997. The 1992 brood year escapement past the Middle Fork Goodnews River weir was 27,267, which exceeds the minimum objective of 25,000 (Appendix A.9). As in District 4, the District 5 commercial harvest has tended towards above average commercial harvests in recent years while still achieving the escapement objective. Even in the poor salmon market the District 5 sockeye fishery drew enough interest in 1996 to maintain an average harvest. The harvest in 1997 will likely be similar to the 1996 catch. The District 5 sockeye harvest is expected to be within the central half of the historical harvest range which is between 30,000 and 40,000 (Table 14).

Chum Salmon

Chum salmon return to the Kuskokwim Area primarily at 5 and 4 years of age, so the main brood years will be 1992 and 1993. The commercial fisheries in Districts 1 and 2 of the Kuskokwim River target chum salmon. Chum salmon catches in Districts 4 and 5 of Kuskokwim Bay are incidental to the directed sockeye fisheries.

Districts 1 and 2

Below average numbers of chum salmon are expected to return to the Kuskokwim River in 1997. Spawning escapements for early running stocks are thought to be indexed by Kogrukluk River weir. Brood year escapements at Kogrukluk weir were 14% above minimum objective in 1992, and 6% above the objective in 1993 (Appendix A.9). This may result in average abundance at the start of the 1997 season; however, a large part of chum salmon production for the Kuskokwim River is attributed to the Aniak River drainage. The Aniak chums are believed to enter the Kuskokwim River a little later in the season than the stocks indexed by Kogrukluk River weir. Chum salmon escapement to the Aniak River in 1992 was 66% below objective while the 1993 escapement was 94% below objective. Conservation actions will likely be necessary

to insure escapement needs at Aniak River are achieved. On a positive note, the abundance of age-4 chums in the Aniak River during 1996 was better than expected, so the return of age 5 chums in 1997 may be better than expected as well. In recent years the Aniak River has demonstrated some widely fluctuating productivity in its chum stocks. The cause of this volatility is unknown, but it introduces a heightened chance for error in the preseason outlook. Regardless of the run strength, the poor chum salmon market and limited processor interest had a strong influence on the low chum harvest in 1996. These conditions are expected to continue in 1997. With that in mind, the 1997 chum salmon harvest in the Kuskokwim River is expected to be below average, perhaps in the range of 100,000 to 300,000 (Table 14).

District 4

In District 4, aerial surveys of the Kanektok River have shown chum escapements to be well below objective for the past several years (Appendix C.3). However, the incidental harvest of chum salmon taken during the sockeye directed fishery has been well above average (Appendix C.2). The chum harvest is driven by the level of commercial effort targeting on sockeye. Consequently, the above average abundance of sockeye in recent years has resulted in a higher than normal harvest of chums. The increased harvests also correspond to an expansion in the number of permit holders participating in the District 4 fishery. The numbers of chum harvested in District 4 has not shown the decline that would be expected from the aerial survey record. One explanation is that chum salmon escapement assessment in the Kanektok River, which is limited to aerial surveys, may be inadequate. An alternative explanation is that a significant portion of the District 4 chum salmon harvest is from non-Kanektok stocks.

In 1996 the fishing effort was markedly down from previous years but the chum harvest was the highest on record. This trend is expected to continue in 1997 due to processors interest in the District 4 sockeye salmon. The 1997 chum harvest in District 4 will likely be above average again with a harvest of 50,000 to 90,000 (Table 14).

District 5

In District 5, chum salmon escapement past the Middle Fork Goodnews River weir was 47% above objective in 1992 and 5% below objective in 1993 (Appendix A.9). As in District 4, the incidental chum harvest is driven by efforts directed at sockeye. Still, management is generally successful at achieving or closely approaching the chum escapement objective. Given the outlook of average sockeye abundance and harvest in 1997, the incidental chum harvest in District 5 is expected to be between 10,000 to 20,000 fish, which is near average (Table 14).

Coho Salmon

Coho salmon return to the Kuskokwim Area primarily as 4-year-old fish, so 1993 will be the key brood year for 1997 returns. There is very little information on which to base the coho run outlooks. The Kogrukluk River and Tuluksak River weirs were the only coho escapement projects operated in the Kuskokwim Area in 1993, and both projects are located on small to moderate sized tributaries of the Kuskokwim River. Market interest in coho salmon have been relatively good in the Kuskokwim Area and that trend is expected to continue in 1997.

Districts 1 and 2

Coho escapement past Kogrukluk River weir in the 1993 brood year was 18% below objective. Tuluksak River weir was in its third year of operation in 1993 and total coho passage was above the previous two years. For reasons unknown, the commercial harvest of coho salmon has been well above average in recent years suggesting above average run sizes. There has also been a tendency for harvest in odd years to be relatively lower than in even years. These trends are expected to continue in 1997 to yield a harvest between 500,000 and 700,000 coho salmon (Table 14).

Districts 4 and 5

Commercial harvest data are the only guide to anticipating coho returns in Districts 4 and 5. In 1993 the coho harvest in District 4 was near average (Appendix C.2). Coho catches over the last five years have been above average, ranging from 55,000 to 86,000. Like the Kuskokwim River, there has been a tendency for catches in odd years to be lower than even years. These trends are expected to continue in 1997 to produce an above average harvest of 60,000 to 120,000 fish (Table 14).

In District 5, the coho harvest in the 1993 brood year was near average. Harvest levels over the past five years have ranged from average to above average and market conditions and processor interest are expected to be comparable to 1996. Therefore, the 1997 coho harvest is expected to be average within the range of 20,000 to 50,000 fish which is average to above (Table 14).

SUBSISTENCE SALMON FISHERY

Background

The harvest of fish and wildlife for subsistence use is an important component of the mixed subsistence-cash economy throughout the Kuskokwim Area. The subsistence salmon fishery in the Kuskokwim Area is one of the largest and most important in the state. During summer, early June through August, the day-to-day activities of many Kuskokwim Area households revolve around the harvesting, processing, and preserving of salmon for subsistence use. The seasonal movement of families from permanent winter communities to

summer fishcamps situated along rivers and sloughs, continues to be a significant element of the annual subsistence harvest effort. Division of Subsistence studies in the region indicate that fish contribute as much as 85% of the total pounds of fish and wildlife harvested in a community annually, and salmon as much as 53% of the total annual harvest. (Coffing 1991).

More than 1,000 households in the region annually harvest salmon for subsistence use. Many other households, which are not directly involved in catching salmon, participate by assisting family and friends with cutting, drying, smoking, and associated preservation activities (salting, canning and freezing). Annual subsistence harvest surveys have been aimed at gathering data on chinook, chum, sockeye, and coho salmon. Subsistence catches of chinook salmon in the Kuskokwim Area often exceed the commercial catch of this species (Appendix A.4).

There are 37 communities consisting of approximately 3,600 households within the Kuskokwim Area (Figure 1). The majority of the area households (3,245) are situated within the drainage of the Kuskokwim River. Bethel is the largest community in the region, containing approximately 1,569 households. Approximately 176 households are located in the northern Kuskokwim Bay communities of Kwigillingok, Kongiganak and Kipnuk. Residents of these three communities harvest subsistence salmon from the Kuskokwim River as well as from areas closer to the communities. Residents of Quinhagak, Goodnews Bay, and Platinum, located along the south shore of Kuskokwim bay, harvest salmon stocks primarily from the Kanektok, Arolik, and Goodnews River systems. Residents of Mekoryuk, Toksook Bay, Nightmute, Tununak, and Newtok, situated along the Bering Sea coast also harvest salmon from coastal waters as well as local tributaries.

Eligibility, Licenses, Permits, and Gear

Eligibility criteria require that individuals be Alaskan residents for the preceding 12 consecutive months before harvesting salmon for subsistence use. Prior to 1990 there were additional restrictions on participation in the fishery. These are described in earlier annual management reports. The majority of those individuals subsistence fishing for salmon in the Kuskokwim Area are residents of the area. People living in other parts of the state who have family or friends in the region sometimes return to the Kuskokwim area to harvest or help process salmon.

During 1996, licenses and permits were not required for subsistence salmon fishing in the Kuskokwim Area. There were no restrictions on the number of salmon that could be harvested by individual fishers or households. Salmon harvested for subsistence use could be caught using set and drift gillnets, beach seines, and fish wheels. In the Holitna, Kanektok, Arolik, and Goodnews River drainages only, spears could also be used. The total length of set or drift gillnets in use by an individual fisher could not exceed 50 fathoms. Unless changed by emergency order, gillnets used for harvesting salmon anywhere in the Kuskokwim Area could be of any size mesh, nets with six inch or smaller mesh could not be more than 45 meshes in depth and nets with greater than six inch mesh could not be more than 35 meshes in depth. Fishers were required to have their name and address attached to their gillnets and fish wheels.

Inseason Subsistence Closures

Areas within the commercial salmon fishing districts were periodically closed to subsistence salmon fishing 16 hours before, during, and 6 hours after commercial salmon fishing periods. The purpose of these closures is to discourage illegal commercial fishing and to help discourage the sale of subsistence caught salmon in the commercial fishery. Many of the commercial fishers are local residents who also participate in the subsistence fishery. The specific area closed to subsistence fishing varies from one district to the next. Except for that area between District 1 and District 2, areas outside of the commercial fishing districts did not close to subsistence fishing.

The entire Kanektok and Arolik Rivers in District 4 and all of the Goodnews River in District 5 were closed to all subsistence fishing with nets 16 hours before, during and 6 hours after each commercial fishing period in those districts. Except for District 2 where all tributaries also closed to subsistence salmon fishing, the tributaries in other districts remained open. That portion of the Kuskokwim River between Districts 1 and 2 was closed to subsistence fishing at the same time subsistence closures occurred in District 1. Kuskokuak Slough, located in District 1, did not close to subsistence fishing after July 31.

SUBSISTENCE SALMON HARVEST SURVEYS

The management of Kuskokwim Area salmon fisheries requires that the department know how many salmon are harvested in both the subsistence and commercial fisheries. Data on the subsistence harvest of salmon are collected annually. Subsistence salmon harvest surveys were first conducted by CFM&D along the Kuskokwim River in 1960. Surveys were initiated in Quinhagak (1967) and Goodnews Bay and Platinum (1979). The Division of Subsistence took over the annual subsistence salmon harvest surveys in 1988 under a reimbursable service agreement and have since then been responsible for collecting and analyzing the data.

Methods

Four methods were used to gather subsistence salmon harvest data. These methods were:

1) subsistence salmon catch calendars,

2) postseason community household surveys,

3) postcard surveys,

4) telephone surveys.

The Division maintains a community household database and updates this database annually during the community surveys. Each household in the database is designated as either "usually fish" or "does not usually fish" depending on past fishing history. Households listed in the database were the basis of sampling

and estimation of subsistence salmon harvests for the Kuskokwim Area. Each household on the list was assigned a unique identifier through which subsequent information could be tracked.

The goals of the postseason survey were to:

1) collect harvest data that would result in a total harvest estimate for subsistence salmon by species for the Kuskokwim Fisheries Management Area by community;

2) compile information on fishing effort, gear types, participation rates, and timing of the subsistence harvest;

3) update community household lists and identify fishing households;

4) determine if subsistence fishing during 1996 was poor, average, or better than average and, if poor, why.

Catch Calendars

In May 1996, subsistence salmon catch calendars were mailed to all Kuskokwim Area households which had been identified as "usually fish." Three similar, but unique, catch calendars (Appendix S.1) were designed for recording the daily catch of each salmon species harvested for subsistence use. One style of calendar was sent to households in communities along the Lower and Middle regions of the Kuskokwim River, to communities along the Bering Sea coast and along North Kuskokwim Bay, as well as those communities in the Upper Kuskokwim River region upstream as far as the community of Stony River. A second style of calendar was sent to the remaining households in the Upper Kuskokwim River region and a third style was sent to households in Quinhagak, Goodnews Bay, and Platinum. Where addresses were available, the calendars were mailed to post office boxes; otherwise calendars were sent general delivery for the post office clerk to distribute. Each calendar was postage paid and addressed for return to the Division of Subsistence office in Bethel. Subsistence salmon catch calendars were distributed to 1,568 households.

Household Surveys

The second method of collecting subsistence salmon harvest information was the postseason household surveys. With this method, staff traveled to communities in the Kuskokwim Area and went house-to-house interviewing residents about their 1996 salmon fishing efforts. Similar to the approach used in developing the catch calendars, three color-coded survey instruments were developed and used (Appendix S.2). Except for local terms used for the salmon species, the survey questions asked in each region were identical.

During 1996, the Division of Subsistence staff conducted house-to-house surveys in 24 communities. Budget constraints have precluded attempts to conduct house-to-house surveys in Bethel, where there are nearly 1,600 households, and in Mekoryuk, Newtok, Nightmute, Toksook Bay, Tununak, Chefornak, and Telida. The villages of Kwigillingok and Kipnuk have not allowed household harvest surveys to be conducted for several years and the community of Kasigluk has not allowed harvest surveys since 1992. Household surveys are usually conducted in Lime Village and Platinum, however, during the 1996 survey period, weather

prevented staff from traveling to these communities. McGrath and Bethel are surveyed primarily by telephone and postcard surveys rather than house-to-house surveys.

Survey efforts in these communities occur over a two-month period beginning in early October after most residents had completed salmon fishing for the season and after most hunters had returned home from fall moose and caribou hunting. Communities in which residents usually harvest salmon through October were surveyed in November. Time spent in any one community ranged from one-half to two days depending on the size of the community.

Survey work was conducted systematically. Prior to beginning the community surveys, efforts were made to inform and prepare residents for the arrival of staff doing the surveys. This was done weeks or days in advance of their arrival through letters to city, tribal, or traditional council offices in each community, radio announcements, posters in public buildings and phone calls to community officials. Staff had also identified households which had already mailed in or returned their salmon harvest calendars.

Upon arrival in a community, staff checked in with the city or council office to introduce themselves and outline their task. Staff used community household checklists, prepared in advance, to help them identify households they needed to contact while conducting household surveys. Each "checklist" contained a listing of all known households in the community, identified those households which were reported to have subsistence fished in 1995 and households which were mailed 1996 catch calendars. Knowledgeable individuals in the community helped staff update the community household list and identify which households "usually fish" and which households "usually do not fish." These individuals also helped to identify households that subsistence fished for salmon in 1996.

Staff attempted to contact all households that were either identified as "usually fish" or were known to have fished during 1996. Structured interviews were conducted with these households through the use of the survey instrument. Subsistence salmon catch calendars that had not been mailed back to the department were also collected. If time permitted, other households on the community list were contacted about their salmon fishing activities. In 1996, 983 households were surveyed using this method.

Postcard Surveys

The third method of collecting information on subsistence harvest of salmon was through the use of postcard surveys (Appendix S.3). The postcard survey simply asked if the household harvested salmon from the Kuskokwim Area for subsistence use, the species and quantities harvested, the type of fishing gear used, and how fishing was for each of the 4 main species usually harvested. The postcard could be separated in half and returned postage paid. This type of survey was the primary method of obtaining harvest data from identified "usually fish" households in Bethel, McGrath, Kipnuk, Kwigillingok, Kasigluk, Mekoryuk, Newtok, Nightmute, Toksook Bay, and Tununak and households in other communities which were not available at the time of the community surveys.

Postcard surveys were mailed out to Bethel and McGrath households in late September. Households in these two communities that had not returned their catch calendar or postcard survey were contacted by telephone in November. If a household did not have a telephone, a second postcard was sent to it in November. Several Bethel households were not surveyed because neither their telephone number nor mailing address was known. Overall, approximately 1,100 households were mailed postcard surveys.

Telephone Surveys

The fourth method of collecting information on subsistence harvest of salmon was through telephone surveys. These surveys were conducted in Bethel and McGrath and followed the questioning format of the postcards. One Nikolai household was also surveyed in this manner. Approximately 500 households were surveyed using this method.

Subsistence Salmon Harvest Estimation

Information from the four information sources (catch calendars, household surveys, postcard, and telephone surveys) was entered into a computer database. Data were verified against source documents, and several logic checks of the data were made. The master list of names and addresses of resident households was updated to reflect changes in household composition and number of households residing in each community. The unique household numbering system was maintained on the master list and on the database tables containing information from each of the four information sources.

In order to provide a single best estimate for a household's harvest of a salmon species during 1996, information was compiled from the various information sources. This process was conducted by a single researcher on the project to ensure data consistency. In most cases, there were few discrepancies between the information available from the different sources. In those cases where a household was determined to have fished for salmon, but no salmon harvest could be quantified through any information source, the harvest was identified as "missing."

Guidelines developed during the course of the process to composite harvest information included the assumptions that:

(1) the salmon catch calendar contained the best means of recording the household's harvest;

(2) information from the different sources needed to be evaluated concurrently in order to identify the harvest for each species;

(3) information from the different sources for a particular species may be different due to the timing of the collection of this information;

(4) information on the use of salmon to feed dogs be used as a minimum estimate of the household's harvest if no other information was available.

Salmon harvests identified as "removed from the commercial catch for subsistence use" were included in the household's subsistence harvest.

The average community catch (C_k) was estimated for salmon species from the composite catch per household data using the following formula:

$C_k = \sum^{1}_{i=0} (N_{ki} * C_{ki}) / \sum^{1}_{i=0} N_{ki}$

where
k = community
I = indicates whether the group "usually fishes" (1) or "usually does not fish"(0)
N_{ki} = number of households that "usually fish" or "usually do not fish "
C_{ki} = mean harvest for households that "usually fish" or "usually do not fish"

The total community catch (T_k) was estimated by $T_k = \sum^{1}_{i=0} (N_{ki} * C_{ki})$ and its variance (V_k) includes a finite population correction factor:

$V_k = \sum^{1}_{i=0} ((N_{ki}^2)(1-(n_{ki}/ N_{ki}))(\sum_{ki}^2/ n_{ki}))$

where n_{ki} = number of households for which information is available that "usually fish" or "usually do not fish" and $\sum_{ki}^2$ = variance for the amount harvested for the "usually fish" or "usually do not fish" households.

If fewer than 30 households or less than 50% of all households in a community were contacted, the reported harvest was used for the estimated harvest. Community catch estimates and their variances were summed across communities for region subtotals and across all regions for Kuskokwim Area totals.

1996 Sampling Summary

A summary of the sampling information by community and fishing area is presented in Table 15. Of the estimated 3,641 households located in the Kuskokwim Area, information was obtained about from 2,030 (56%).

In total 1,675 households have been classified as "usually fish." In 1996, subsistence salmon harvest information was collected from 1,242 (74%) of these households. Households classified as "usually do not fish" for salmon totaled 1,966. Information was collected from 582 (30%) of these households. Many (39%) of the households classified as "usually do not fish" resided in Bethel.

Fishing activity information was obtained for 1,837 households within the Kuskokwim River drainage. A total of 1,641 of these households were successfully contacted. One thousand thirty seven (1,037) Kuskokwim River drainage households harvested salmon for subsistence use during 1996. The Bethel household list was updated again in 1996, removing several hundred names which had been erroneously added the previous year from the State of Alaska Permanent Fund list.

In the region containing the communities of Quinhagak, Goodnews Bay, and Platinum, the majority, 137 (71%), of the 193 households living in the region were contacted. Of these contacted households, 92 (67%) fished for subsistence salmon in 1996.

In Kongiganak, Kipnuk, and Kwigillingok, communities along northern Kuskokwim Bay, data were obtained only from Kongiganak (58 households). Seventy-two percent of the households in Kongiganak reported fishing for subsistence salmon in 1996.

In total 271 households have been identified in the Bering Sea coast communities of Mekoryuk, Newtok, Nightmute, Toksook Bay, and Tununak. Because house-to-house surveys were not conducted in these communities, data were obtained only by catch calendars and postcards. Three households in this region provided information and each reported harvesting salmon. Based on data gathered in other years, actual participation in salmon harvesting activities is thought to be much greater than that reported by catch calendars or postcard surveys.

House-to-house surveys continue to be the primary vehicle for gathering data on harvest and use of subsistence salmon. Except for Bethel and McGrath where postcard surveys and telephone interviews were the primary data collection method, house-to-house surveys accounted for 54% of all households contacted.

In total, 19% (296) of the 1,568 subsistence salmon calendars which were mailed preseason were used and returned. There were responses to 163 (15%) of the 1,083 postcard surveys which were mailed to Kuskokwim Area households who had not returned harvest calendars and were not interviewed by staff.

1996 Harvest Summary

A summary of the subsistence salmon harvest estimates by community and fishing area are presented in Table 16. The 1996 total subsistence salmon harvest estimates for the Kuskokwim Area are 82,353 chinook, 90,761 chum, 35,198 sockeye, and 35,154 coho salmon.

Chinook and chum salmon harvests usually account for the largest proportion of the total subsistence salmon harvest and this was again the case in 1996. Prior to 1994, the total subsistence chum salmon harvest was usually greater than each of the other salmon species. This was also true for 1996.

The subsistence harvest by communities located in commercial salmon fishing District 1 accounted for 75% of the total 1996 subsistence salmon harvest in the Kuskokwim area. Correspondingly, approximately 70% of the area population resides in District 1.

Several hundred households provided information on the types of gear they used for harvesting subsistence salmon. It was not unusual for households to use more than one gear type. Overall, 704 households responded using drift gillnets, 246 reported using set gillnets, and 138 reported harvesting subsistence salmon with rod and reel gear (Table 17). Drift gillnets were the primary gear type used along the lower and middle Kuskokwim River while nearly equal numbers of drift and set gillnets were used within the upper Kuskokwim region. Fish wheels were reported only on the middle and upper Kuskokwim River where a total of 10 households reported wheels as a gear type. One Bethel household used a seine. Spears were not reportedly used by households surveyed during the 1996 season.

Approximately 30% of the households that reported they commercial fished during 1996 reported keeping salmon from their commercial catch for subsistence use (Table 18). Approximately 3,000 chum salmon were retained from the commercial catch for subsistence use. More than 50% of the chums retained were attributed to a single community, Tuntutuliak. The number of chinook, sockeye, and coho salmon retained from commercial fishing efforts totaled approximately 1,700 fish.

Approximately 800 households responded to a question about the quality of subsistence salmon fishing during 1996. The majority (91%) of households surveyed reported that subsistence salmon fishing was very good (53%) or about average (38%) during 1996. Nine percent of the households reported that subsistence salmon fishing was poor during 1996.

Ninety-three percent of the responding households reported that chinook fishing was very good or average. Eighty-five percent reported sockeye fishing as very good or average. Ninety-one percent reported chum fishing as very good or average. Ninety-five percent ranked coho fishing as very good or average. Subsistence sockeye salmon fishing was reported poor by 15% of the 524 households responding, especially in the middle Kuskokwim River (19%) and the South Kuskokwim Bay (19%) communities. Twenty-five percent of the households in the upper Kuskokwim River region ranked chum salmon fishing as poor, the highest for any species in any region. Reasons for poor fishing were often of a personal nature such as problems with their fishing gear or boat and motor as examples.

PART II: FRESHWATER FINFISH FISHERY

Several species other than salmon, herring, and halibut are used for commercial, subsistence, and recreation purposes in the Kuskokwim Area. They are inconnu or sheefish (*Stenodus leucichthys*), whitefish *(Coregonus)* and *(Prosopium)* char *(Salvelinus)*, burbot *(Lota lota)*, Arctic grayling *(Thymallus arcticus)*, northern pike *(Esox lucius)*, Arctic lamprey (*Lampetra japonica*), rainbow smelt (*Osmerus mordax*) blackfish (*Dallia pectoralis*), rainbow trout *(Oncorhynchus mykiss)*, lake trout *(Salvelinus namaycush)*, threespine stickleback *(Gasterosteus aculeatus)*, ninespine stickleback *(Pungitius pungitius)*, and longnose sucker *(Catostomus catostomus)*. The Division of Sport Fish documents the recreational fisheries.

Subsistence Fishery

Methods used for harvesting subsistence freshwater finfish include set and drift gillnets, seine, fishwheels, long lines, dip nets, jigging (hook and line through the ice), and pots (locally called "traps"). Subsistence harvests occur year round. These fish may be eaten fresh, dried, smoked, or frozen. Most are used for human consumption, however, some are also used for dog food. Regulations do not limit the number of freshwater fish that may be harvested using subsistence gear. Harvest data for these species are not collected on an annual basis. Data for some Kuskokwim Area communities may be found in the Division of Subsistence Technical Paper series.

Commercial Fishery

The commercial fishery has been sporadic, primarily harvesting whitefish and burbot for local markets. Some of the whitefish harvest occurs under the ice in the winter.

A permit from the Commercial Fisheries Entry Commission is required. A permit from the department to conduct commercial fisheries on whitefish, pike, smelt, burbot, and lamprey is also required. Those species may also be taken incidentally to commercial salmon fishing. Six freshwater permits were issued in 1996 for the Kuskokwim Area. The guidelines for permits are:

1. All waters of the area except the Johnson River drainage and Whitefish Lake are open to commercial harvest of freshwater finfish. The heavy subsistence utilization of freshwater species in these areas is the reason for the closure.

2. Only whitefish, cisco, smelt, pike, burbot, and lamprey may be taken. Sheefish, char, and trout may not be taken due to their small population, low reproductive rates, and their heavy utilization in the subsistence and sport fisheries.

3. All legal commercial gear types are allowed.

4. Gillnets must be greater than 2½ and less than 5 inches stretch mesh. Long lines and set lines must use hooks with a gap between point and shank larger than 3/4 inch.

Appendix F.1 presents the freshwater finfish fishery catches and value since 1977. Only 2 permit holders landed fish in 1996. The exvessel value of the harvest was $4,776. The first commercial harvest of blackfish recorded in the Kuskokwim Area was made this year when 6.5 pounds were sold.

Stock Status

The department does not monitor the status of the freshwater species in the Kuskokwim Area. Limited department observations, advisory committee recommendations and fishers interviews give no indication of declining populations in most drainages. Residents of Kasigluk, Atmautluak and Nunapitchuk have expressed concerns that the whitefish stocks in Nunavakpak Lake (near Kasigluk) are being overexploited by subsistence fishers.

PART III: MISCELLANEOUS SALTWATER FINFISH

A poorly documented commercial fishery on Saffron *(Eleginus gracilus)*, or "Tom Cod" has occurred in the Kuskokwim Area for some time. These fish were surplus to subsistence needs and fishers and local stores were, and often still are, unaware of the regulatory requirements. The department has been trying to inform buyers and sellers of these requirements. Since 1988 we have had information on the sale of fish exported from the coastal villages to Bethel. Sales within the villages are still undocumented. Two commercial landings were documented in 1996 (Appendix G.1).

PART IV. HERRING FISHERY

INTRODUCTION

Area and District Boundaries

There are five commercial sac roe herring districts and a subsistence herring fishery in the Kuskokwim Area. The Security Cove District includes all waters between the latitude of Cape Newenham and the latitude of the Salmon River (Figure 8). The Goodnews Bay District includes the waters of Goodnews Bay inside the north and south spits at the mouth and a line between the Ukfigag and Tunulik Rivers. The Cape Avinof District (Figure 9) consists of all waters landward of Kikegtek, Pingurbek and Kwigluk Islands from the longitude of Ishkowik River (162° 44' W. long) to the longitude of the Ursukfak River (164° 11' W. long). The Nelson Island District consists of all waters north of Chinigyak Cape and east of Atmak Point, and all waters north of Talurarevuk Point and south of the southernmost tip of Chinit Point and east of 165° 30' W. long., and all waters north of the northernmost tip of Chinit Point and south of Kigigak Island and east of 165° 30' W. long. (Figure 10). The Nunivak Island District includes all waters extending three miles seaward of mean low water along the northern and east sides of Nunivak Islands from Kikoojit Rocks (60° 20' 00" N. lat., 166° 39' 05" W. long.) to Kaksajookalik Island (59° 45' 10" N. lat., 166° 14' 20" W. long.), the western most point of Cape Mendenhall (Figure 11).

Management Programs

To provide for an orderly fishery and allow for periodic assessment of herring biomass, commercial herring fishing is regulated by emergency order in all AYK districts. The Security Cove, Goodnews Bay and Nunivak Island commercial herring fisheries are managed under the Bering Sea Herring Fishery Management Plan which sets the maximum exploitation rate at 20% of the estimated spawning biomass. The department attempts to harvest stocks in good condition (large volume, increasing abundance, good recruitment) at the upper end of the exploitation range (15-20%). Stocks in poor condition (small volume, decreasing abundance, poor recruitment) are exploited at lower than maximum rates (0-15%). The Alaska Board of Fisheries has directed the department to manage the commercial herring fisheries in the Nelson Island, and Cape Avinof Districts for an exploitation rate not to exceed 15% of the estimated available biomass. To provide additional protection for the subsistence herring harvest in the Nelson Island District, the following guidelines have been established by the Board of Fisheries:

1. The commercial fishery will be allowed to take up to 15% of the herring biomass, compared to up to 20% for most other fisheries having stocks of similar size and condition.

2. The commercial fishing season will be opened when a biomass of 3,000 tons or spawning activity is documented.

3. Periodic closures of the commercial fishery will be scheduled, during which time only subsistence fishing will be allowed.

4. Several important subsistence use areas occur throughout the district (e.g., waters around Cape Vancouver) and specific areas may be closed to commercial fishing to insure the adequacy of subsistence harvests.

5. The department will use all available means, including input from local residents, to insure the adequacy of subsistence herring harvests during the commercial fishing season.

In 1990 the Nelson and Nunivak Island Districts were given limited entry status by the Commercial Fisheries Entry Commission. Entry permits were issued to qualified applicants who had fished in these fisheries before 1 January 1988.

Season Summary

The total Kuskokwim Area herring harvest for 1996 was 5,014 tons with a total estimated value to the fishers of approximately $3,523,000 (Appendix H.1). This was the highest catch and exvessel value in the history of the Kuskokwim Area fishery. The average price paid in all districts was $600 per ton for 10% roe recovery, with an increase or decrease of $60 per ton for each percentage point above or below 10%. This was the same price paid in 1995 and $300 more per ton than in 1994. Commercial fisheries occurred in all districts. The only food/bait fishery in this area occurs during the sac roe fishery when the roe content is below the processors' acceptable minimums. Food/bait sales are a smaller portion of the harvest. Food/bait sales totaled 156 tons, while the sac roe harvest was 4,854 tons. Approximately 5 tons of herring were wasted.

Fishing participation, measured in number of fishers who made at least one delivery, increased from 1995 levels by 208% in Security Cove, 43% in Goodnews Bay, 9% at Nelson Island, 85% in Nunivak Island and 73% at Cape Avinof (Appendix H.2). A record 802 permit holders landed herring in the Kuskokwim Area, an increase of 83% from 1995. Fourteen companies bought herring in the Kuskokwim Area in 1996. Average percent roe recovery, from sac roe quality herring, ranged from 9.9 in the Nunivak Island District to 13.4 in the Cape Avinof District. The overall average sac roe content was 12.1%, second highest on record for the Kuskokwim Area. Estimated exploitation rate of the herring biomass ranged from 2.4 in the Nunivak Island District to 27.1 in the Security Cove District (Appendix H.1). Average exvessel earnings per permit holder ranged from $6,208 at Nelson Island to $1,593 in the Nunivak Island subdistrict (Appendix H.3).

The 1996 total estimated herring spawning biomass was 28,517 tons for the surveyed portion of the Kuskokwim Area herring districts. This was 6% higher than the 1995 estimate (Appendix H.1). Ages 9 and older herring comprised 40% of the total biomass (Table 20). Recruit herring (ages 3, 4, and 5) accounted for 26% of the total run in number of fish (Table 19).

STOCK STATUS

Assessment Methods

Aerial surveys were flown throughout the herring spawning season in all Kuskokwim Area commercial fishing districts to determine relative abundance, distribution, and biomass of herring. Occurrence and extent of milt, numbers of fishing vessels, and visibility features affecting survey quality were also recorded. Data collection methods were similar to those used since 1978.

Approximately 36 hours were spent conducting aerial surveys in the Kuskokwim Area: 14 hours in Security Cove and Goodnews Bay, 4 hours in the Cape Avinof District, 4 hours in Nelson Island and 14 hours in Nunivak Island. Weather and sea conditions were fair at best in all districts, with the majority of surveys being conducted under poor conditions.

Standard conversions of 1.52 tons/538 ft^2 (water depths less than 16 ft), 2.58 tons/538 ft (water depths between 16 and 26 ft) and 2.83 tons/538 ft^2 (water depths greater than 26 ft) were used to convert estimated herring school surface areas to biomass within all districts.

Test fishing with variable mesh gillnets occurred in all districts to determine age, sex, size and sexual maturity of herring and to note occurrence of other schooling fishes. The sampling goal for test fish catches was to sample a minimum of 60 herring per day or 420 per week from each district. Commercial landings were sampled in all fishing districts. Age composition of herring collected from the department test fishery and the commercial catch is summarized, by district, in Table 19 and Figure12. Additionally, volunteer gillnet vessels collected herring samples within all districts. This information allows interpretation and modification of aerial survey biomass data.

Ground surveys conducted in some districts provide information on the distribution and density of eel grass beds and herring spawn deposition.

Spawning Populations

Security Cove District

Eleven aerial surveys were flown on 10 days during the 1996 season, from 1 May to 17 May. Seven of these surveys were flown under acceptable conditions. Herring schools were first observed in the district on 6 May (3,539 tons). On 10 May, 6,026 tons of herring were observed during an aerial survey. The herring biomass expected to return to the Security Cove District in 1996 was 5,623 tons based on preseason projections. On 13 May, the day following the commercial fishery, 5,008 tons of herring were observed. The total biomass estimate of 6,867 tons was calculated by combining the 13 May aerial survey biomass and the commercial harvest of 1,854 tons. A total of 19.7 miles of spawn was observed in the district with peak spawning activity (6.0 miles) on 10 May.

The Security Cove test fish crew fished from 5 May to 29 May with variable mesh gillnets. From this catch, 1,337 herring were sampled for age, sex, size and maturity. Age 9 and older herring comprised 47% of the biomass (Table 20) while 3 to 5 year old fish were 25% of the return in numbers of fish (Table 19). Volunteer commercial fishers collected herring samples from designated areas of the district that industry roe technicians evaluated for roe quality. This program allowed the openings to be timed to maximize roe production.

Goodnews Bay District

Twelve aerial surveys were flown on 12 days during the 1996 season, from 1 May to 4 June. Six of these were flown under satisfactory conditions. A survey on 8 May saw 4,482 tons in the district. During a survey on 17 May, 4,448 tons were observed. The herring biomass expected to return to the Goodnews Bay District in 1996 was 2,842 tons based on preseason projections. The total biomass estimate of 6,315 tons was calculated by combining fish seen on the 17 May survey that were not present on 8 May. Two and one-half miles of spawn were observed during aerial surveys of the district.

Test fishing occurred from 6 May to 30 May. The catch of 1,103 herring were sampled for age-sex-size data. Age 8 herring dominated both the biomass (24%) and the return in numbers of fish (23%) (Table 19). Age 9 and older herring made up 42% of the biomass (Table 20) while aged 3 to 5 fish were 27% of the test catch (Table 19).

Volunteer commercial fishers collected herring samples from designated areas of the Bay which industry roe technicians evaluated for roe quality. This program allowed the openings to be timed to maximize roe production.

Cape Avinof District

Between 19 May and 2 June, 5 aerial surveys were flown in the Cape Avinof District. One of these surveys was flown under satisfactory conditions. An aerial survey on 2 June saw 1,276 tons of herring. The total biomass present in the district was estimated to be 4,500 tons based on a comparison of the commercial fishery CPUE in 1995 and 1996. No spawn was observed during aerial surveys in the Cape Avinof District in 1996. Spawning was documented by the test fish crew and local residents.

The department's test fishery near Kipnuk captured 1,018 herring between 18 May and 4 June to sample for age-sex-size data. Age 8 herring were the predominant age class (24%) while 30% of the biomass was age 9 or older (Table 20). Recruit herring represented 29% of the return in numbers of fish (Table 19).

Commercial fishers brought in herring samples from various areas in the district for industry roe technicians to evaluate. This information was used to help determine the timing of fishing periods.

Nelson Island District

Eleven aerial surveys were flown on 11 days from 12 May to 2 June during the 1996 season. Two of these surveys were made under acceptable conditions. During an aerial survey on 15 May, 1,350 tons of herring were observed in the district. Since no acceptable surveys occurred after the 15 May survey, the preseason forecasted biomass of 6,638 tons was used as the total biomass estimate for 1996. A total of 3.4 miles of spawn was observed during aerial surveys of the district. Peak spawning was observed on 15 May when 1.6 miles of spawn were sighted.

Test fishing with variable mesh gillnets occurred from 19 May to 13 June. Age, sex, size and maturity information was taken from 1,853 herring. Age 3 to 5 fish made up 26% of the test catch while 27% were age 9 or older herring. Age 8 herring dominated the return in biomass (23%) (Table 20) and in numbers of fish (21%) (Table 19).

Nunivak Island District

Ten aerial surveys were flown on 10 days between 12 May and 2 June during the 1996 season. One survey was made under acceptable conditions. During an aerial survey on 14 May, 805 tons of herring were observed. A total of 3.9 linear miles of spawn was observed during aerial surveys with a peak spawn of 1.1 miles documented on 12 May. An industry spotter pilot reported sighting approximately 2,200 tons of herring and 5.3 miles of spawn on 13 May.

The department test fishery sampled 843 herring for biological data between 12 May and 4 June. Age 8 herring dominated the return in biomass (24%) (Table 20) while age 5 fish dominated in number of fish (21%) (Table 19). Age 9 and older herring comprised 32% of the biomass and recruit herring were 25% of the run in number of fish.

Central Kuskokwim Bay

The Central Kuskokwim Bay area extends from Jacksmith Bay, south of Quinhagak, to the Ishkowik River (Figure 1). No commercial herring fishing districts are located in this area. Five aerial surveys were flown in this area from 1 May to 15 May . All but one of these surveys were flown under unsatisfactory conditions. During a survey on 13 May, 332 tons of herring were observed.

SUBSISTENCE FISHERY

Subsistence fishing for herring in the northeastern Bering Sea is very important in villages of the Yukon-Kuskokwim River delta. The subsistence fishery is conducted primarily by residents of the coastal villages of Kwigillingok, Kongiganak, Kipnuk, Chefornak, Toksook Bay, Umkumiut, Nightmute, Tununak, and Newtok. The herring stocks utilized by the subsistence fishery are the same ones targeted by the commercial fishery in the nearby commercial fishing districts.

Subsistence harvest surveys have occurred annually in Nelson Island villages since 1985 and sporadically in Kuskokwim delta villages since 1975. Average annual herring subsistence harvests have been at least 110 tons since 1975 (Appendix H.4). The 1996 subsistence survey of Nelson Island communities resulted in an estimated 95 tons of subsistence herring harvested. Subsistence survey results reflect harvest trends and reported catches represent minimum figures since not all fishers are contacted, substantial herring roe on kelp harvests are not included, and other Kuskokwim River delta villages were not surveyed.

Most Nelson Island families expressed satisfaction with their subsistence herring harvest in 1996. Timing of the fishery, quality and quantity of herring and excellent drying weather cooperated to produce a good season. Relatively few herring of high fat content were reported which minimized spoilage.

COMMERCIAL FISHERY

Security Cove District

The commercial herring fishery in the Security Cove District has opened and closed by emergency order since 1981 to provide for an orderly fishery and allow periodic assessment of herring biomass. In 1996, 326 fishermen harvested 1,854 tons of herring in two commercial periods for a total fishing time of 5.5 hours. Approximately 5 tons of herring were wasted by fishermen due to low roe content. The average roe recovery of the harvest was 11.6%. The harvest and participation (number of permits) were a record high for the district (Appendix H.1).

On 8, 9 and 10 May commercial test fishers were unable to find adequate quantities of herring with acceptable roe quality. On 11 May commercial test fishing in the northern half of the district produced 13 samples with an overall average of 10.6% mature roe.

The first commercial period in the Security Cove District was for 2 hours on 11 May starting at 1300 hours. Two hundred seventy-seven permit holders delivered 379 tons of sac roe quality herring with an average roe content of 11.4% and 32 tons of bait herring. The second opening occurred on 12 May for 3.5 hours starting at 1500 hours. A 3.5 hour period seemed appropriate given the catch rates from the pervious opening. The harvest quota was exceeded when catch rates increased dramatically with 307 permit holders delivering 1,417 tons of sac roe quality herring with an average roe content of 11.6% and 26 tons of bait (Table 21). Approximately 5 tons of herring were wasted by fishermen due to low roe content.

The total harvest of 1,859 tons was composed of 1,795 tons of sac roe herring with an average roe content of 11.6%, 59 tons of bait with an average roe content of 7.0% and 5 tons of waste. Fourteen processors bought herring from 326 permit holders who made 601 deliveries with an estimated exvessel value of $1,251,000. The exploitation rate was 27.1% of the available biomass (Appendix H.1).

A sample of 345 herring was taken from the commercial catch. Age 8 herring comprised the largest age group in the harvest biomass (34%). Age 9 and older herring made up 60% of the catch by weight (Table 20). No recruit herring (ages 3, 4 and 5) were harvested.

Goodnews Bay District

Since 1981, commercial herring fishing in Goodnews Bay has opened and closed by emergency order to provide for an orderly fishery and periodic assessments of herring biomass. In 1996, 1,204 tons were harvested in 11 commercial periods for a total fishing time of 45 hours. This was a record high harvest and number of permits in this district.

A meeting with fishermen and processors was held on 15 May. Commercial fishermen brought catch samples to the meeting for evaluation by industry roe technicians. Roe content of commercial test fish samples averaged 10.8%. High winds and rough seas significantly reduced effort and catch rates in most commercial periods. The fishery first opened on 16 May for 4 hours with 46 permit holders delivering 71 tons of sac roe herring with an average roe content of 11.7%. During a 4 hour period on 17 May, 366 tons of herring with an average roe content of 11.8% were caught. Between 18 May and 25 May, the district was reopened 9 times for a total of 37 hours of fishing time. Harvest ranged from 23 tons on 23 May to 197 tons on 25 May (Table 21).

Total catch in 1996 was 1,191 tons of sac roe quality herring with an average roe content of 12.5% and 13 tons of bait. During the fishery, roe contents ranged from 11.4% to 13.9%. Five processors bought herring from 182 permit holders who made 1,186 deliveries with an estimated exvessel value of $895,000. The exploitation rate was 19.1% of the available biomass.

A sample of 419 herring was taken from the commercial catch. The largest age class in the harvest was age 8 (35%). Age 9 and older herring made up 61% of the catch (Table 20). Recruit herring comprised less than 1% of the harvest.

Cape Avinof District

In 1996, 820 tons of herring were harvested by 161 permit holders during eleven commercial openings for a total fishing time of 57 hours. The harvest and number of permits were records for this district.

Samples caught near Kwigillingok by commercial fishers on 18 May had an average roe content of 12.3%. Commercial test fishing in the Kipnuk area on 21 May produced 7 samples with an average roe content of 13.1%.

Between 19 May and 21 May commercial fishing occurred only in the southern half (defined as waters east of Kwigluk Island) of the district. Ice conditions did not allow commercial fishing in the northern half of the district until 22 May.

The southern half of the district was first opened to commercial fishing for six hours starting at 0800 hours on 19 May. The harvest was 6 tons of sac-roe herring with an average roe content of 13.3%. Twenty-five permit holders made deliveries. Between 19 May and 21 May the southern half of the district was reopened five times for 24 hours of fishing time. Catches ranged from 1 ton on 20 May to 11 tons on 21 May. Roe contents ranged from 12.8% to 14.6%. Between 22 May and 24 May, commercial fishing occurred in both the northern and southern halves of the district. In the southern half, the harvest was 10 tons on 23 May and

7 tons on 24 May. There was no commercial harvest in the southern half of the district after tenders left the area on 24 May. A total of 46 tons of sac roe quality herring with an average roe content of 13.5% was caught in the southern half of the district.

The first opening in the northern part of the district occurred on 22 May for 6 hours when 83 permit holders landed 59 tons of herring with an average roe content of 13.4%. Between 23 May and 26 May the district was reopened 4 times for 21 hours of fishing time. Catches ranged from 101 tons on 25 May to 285 tons on 24 May. Average roe contents ranged from 12.4% to 14.5%. A total of 774 tons of sac roe quality herring with an average roe content of approximately 13.4% (Table 21) were caught in the northern half of the district.

In the entire Cape Avinof District, 161 permit holders made 833 deliveries, worth approximately $659,000, to two processors. The catch totaled 820 tons with an average roe content of 13.4%. The exploitation rate was 18.2% of the available biomass (Appendix H.1).

Seven hundred and forty-one herring were sampled from the commercial catch. Age 9 and older herring made up 74% of the catch (Table 20). Recruit herring comprised less than 1% of the harvest.

Nelson Island District

During the 1996 season, 1,031 tons of sac roe-quality herring with an average roe content of 11.4% were harvested. The fishery consisted of five commercial openings from 16 May to 18 May for a total fishing time of 25 hours.

The first opening was for five hours starting at 0700 hours on 16 May. The harvest of 166 tons of sac roe quality herring with an average roe content of 10.6% and 13 tons of bait was taken by 72 permit holders. The second opening was for four hours beginning 1700 hours on 16 May. Thirty-seven permit holders made landings of 78 tons of sac roe herring with an average roe content of 11.0% and 2 tons of bait. The next commercial period was on 17 May for five hours starting at 9:00 am. Catch from this period was 179 tons of sac roe herring with a roe content of 11.5% and 2 tons of bait. A six hour period starting at 1700 hours on 17 May saw 85 permit holders catch 322 tons of sac roe herring with an average roe content of 11.6% and 19 tons of bait. The final period lasted five hours starting at 1000 hours on 18 May. Ninety-two permit holders delivered 242 tons of sac roe herring with an average roe content (Table 21) of 11.9% and 8 tons of bait.

The total catch of 1,031 tons had an average roe content of 11.4%. Three processors paid approximately $679,000 to 109 permit holders. The exploitation rate was 15.5% of the available biomass (Appendix H.1).

A total of 402 herring were sampled from the commercial catch. Age 9 herring dominated the harvest (22%). Age 9 and older herring made up 79% of the catch (Table 20). No recruit herring (ages 3, 4, and 5) were harvested.

Nunivak Island District

Commercial fishing for herring in the Nunivak Island District began in 1985. The Nunivak Island District had six commercial herring periods in 1996 for a total fishing time of 256 hours. Fishermen harvested 61 tons of sac roe herring with an average roe content of 9.9% and 40 tons of bait.

The district was open five times for 32 hours of fishing time from 14 May to 24 May. On 27 May the fishery opened continuously until 5 June (Table 21). Two processors purchased $39,000 worth of herring from 24 permit holders. The exploitation rate was 2.4% of the projected biomass or 7.8% of the peak aerial survey biomass estimate (Appendix H.1).

A total of 487 herring were sampled from the commercial catch. Recruit herring comprised less than 1% of the harvest. Age 8 herring dominated the harvest biomass (20%). Herring aged 9 and older comprised 75% of the catch sample by weight (Table 20).

Enforcement

The Division of Fish and Wildlife Protection (FWP) was present in the Goodnews Bay and Nelson Island Districts this year. At least 10 people from FWP were involved in Kuskokwim Bay herring fisheries. The P/V Walstad, two supercub aircraft, a Cessna 185 and a FWP skiff were utilized by enforcement officers.

OUTLOOK AND MANAGEMENT STRATEGY FOR 1997

Projections from postseason escapement estimates, using historical mean rates of survival and current mean weights for each age class, and estimates of recruitment for each age class (Wespedstad 1982), suggest that the 1997 spawning biomass for the Kuskokwim Bay herring stocks (Security Cove to Nunivak Island) will be approximately 22,024 tons with a projected harvest of 3,963 tons (Table 22). If the return is as expected, a moderate reduction in biomass will be observed in all districts. However, variability in the quality of aerial survey assessments of biomass and deviations from the assumed survival or recruitment rates may result in the observed biomass being either above or below these projections. Therefore, harvest levels will be adjusted during the season according to observed herring spawning biomass. In addition, in accordance with the AYK Region harvest policy, newly recruited age classes (age 2 through 5 year-old herring) will not be targeted by the commercial fishery. If it is not possible to determine herring abundance using aerial survey methods, stock abundance will be assessed using information from the projected biomass, test and commercial catches and spawn deposition observations.

Security Cove District

The 1997 projected return to the Security Cove District is 4,640 tons. A 20% exploitation rate would result in a harvest of about 928 tons (Table 22). A larger catch may occur if the 1997 biomass assessment is greater than the projection. Commercial fishing will not be allowed until the observed biomass reaches 1,200 tons or significant spawning activity is observed. The occurrence and length of fishing periods will depend on stock strength, fishing effort, and spawning activity.

Ages 9 and 10 herring are expected to dominate the return. Age 9 and older herring are expected to comprise approximately 50% of the biomass.

Goodnews Bay District

The management strategy for this district will be similar to that planned for Security Cove. The season will open and close by emergency order when a biomass of 1,200 tons is observed or spawning activity occurs. The 1997 projected return of herring to the Goodnews Bay District is 4,752 tons. A 20% exploitation rate would result in a harvest of 950 tons (Table 22). A larger catch may occur if the 1997 biomass assessment is greater than the projection.

Age 9 and 10 herring are expected to comprise nearly 40% of the biomass. Age 9 and older herring are expected to comprise nearly 50% of the biomass.

Cape Avinof District

Either significant spawning activity or a biomass of 500 tons must be observed before the commercial herring season can be opened. The season will open and close by emergency order. The projected 1997 biomass for the Cape Avinof District is 3,737 tons (Table 22). The exploitation rate will be no greater than 15% because of the limited data base for this area and the priority of subsistence fishing. Assuming a 15% commercial exploitation rate, the projected harvest would be 561 tons of herring.

Age 6, 7 and 9 herring are expected to dominate the returning population. Age 9 and older herring are expected to comprise nearly 40% of the biomass.

Nelson Island District

In the Bering Sea Herring Fishery Management Plan, the Alaska Board of Fisheries set a minimum biomass threshold of 3,000 tons necessary for a commercial herring fishery in the Nelson Island District. The inseason estimate of herring biomass must exceed the threshold level before a commercial fishery can be allowed. The spawning biomass projected to return to the Nelson Island District in 1997 is 5,094 tons (Table 22). At an exploitation rate of 15%, the harvest will be 764 tons of herring. A larger catch may occur if the 1997 biomass assessment is greater than the projection. Guidelines established by the Board of Fisheries (see page 32, above) that provide additional protection for the subsistence harvest of herring will be followed.

Age 9 is expected to be the dominant age group in the biomass; age 7 herring are expected to dominate in numbers of fish. Age 9 and older herring are expected to comprise almost 50% of the biomass in 1997.

Nunivak Island District

The commercial season will open when the biomass reaches 1,500 tons or when significant spawning is observed. The projected biomass of herring returning to the Nunivak Island District in 1997 is 3,801 tons. A 20% exploitation rate would result in a 760 ton harvest (Table 22). A larger catch may occur if the 1997 biomass assessment is greater than the projection.

Age 7 is expected to be the dominant age group. Age 9 and older herring are expected to comprise nearly 40% of the return.

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TABLES

Table 1. Salmon fishery projects to be operated in the Kuskokwim Area during 1996.

Project Name	Location	Primary Objectives	Duration	Agency	Responsibility
Salmon Management Plan	Kuskokwim Area	- develop a comprehensive plan for managing salmon stocks of the Kuskokwim Area. - define goals and objectives. - identify potential opportunities and concerns. - recommend appropriate procedures. - evaluate priorities.	June - Sept.	ADFG/CFMD	all aspects
Subsistence Catch and Effort Assessment	Kuskokwim Area	- document and estimate the catch and associated effort of the subsistence salmon fisheries via interviews, catch calendars, mail-out questionnaires and telephone intervie	Post-season	ADFG/S	all aspects
Escapement Sampling	Kuskokwim Area	- estimate age, sex and length of chinook, sockeye, chum and coho salmon from selected tributary spawning populations.	June - Sept	ADFG/CFMD	all aspects
Aerial Surveys	Kuskokwim Area	- index relative abundance of chinook salmon spawning escapement in selected streams througout the Kuskokwim Area. - index relative abundance of sockeye salmon spawning escapement in the Kanektok and Goodnews Rivers.	July - Aug	ADFG/CFMD	all aspects
Sport Catch, Harvest and Effort Assessment	Kuskokwim Area	- statewide mail-out survey to estimate sport catch, harvest and effort	post-season	ADFG/SF	all aspects
Commercial Catch and Effort Assessment	Districts 1, 2, 4 and 5	- document and estimate the catch and associated effort of the commercial salmon fisher via receipts (fish tickets) of commercial sales and dock side sampling.	June - Sept	ADFG/CFMD	all aspects
Commercial Catch Sampling	Districts 1, 4 and 5	- determine age, sex, and length of salmon harvested in the commercial fisheries.	June - Sept	ADFG/CFMD	all aspects
Bethel Test Fishery	Bethel Area RM. 80	- index relative run timing of chinook, sockeye, chum and coho salmon using drift gillnets. - index relative run abundance of chinook, sockeye, chum and coho salmon using CPUE derived from drift gillnet catches.	June - Aug	ADFG/CFMD	all aspects
Kwethluk River Counting Tower	Kwethluk River RM. 99	- estimate daily escapement of chinook, sockeye, chum and pink salmon into the Kwethluk River. - estimate age, sex and length composition of chinook and chum salmon escapement.	June - July	AVCP ADFG/CFMD USFWS BSFA	all aspects planning, supplies & crew support planning & supplies funding

- continued-

Table 1. (continued)

Project Name	Location	Primary Objectives	Duration	Agency	Responsibility
Aniak River Sonar	mile 12 Aniak River RM. 225	- estimate daily escapement of salmon into the Aniak River. - estimate age, sex and length composition of chum salmon escapement	June - July	ADFG/CFMD	all aspects
				AVCP	crew support
George River Weir	mile 4 George River RM. 309	- estimate daily escapement of chinook, sockeye, chum and pink salmon into the George River. - estimate age, sex and length composition of chinook and chum salmon escapement.	June - July	KNA	all aspects
				ADFG/CFMD	all aspects crew leader
				BSFA	funding
Kogrukluk River Weir	mile 85 Holitna River Drainage RM. 335	- estimate daily escapement of chinook, sockeye, chum and coho salmon into the Kogrukluk River. - estimate age, sex and length composition of chinook, chum and coho salmon escapement	June - Sept	ADFG/CFMD	all aspects
Takotna River Counting Tower	mile 35 Takotna River RM. 507	- estimate daily escapement of chinook and chum salmon into the Takotna River.	June - July	TCSTC	all aspects
				ADFG/CFMD	planning & supplies
				BSFA	funding
Kanektok River Counting Tower	mile 7 Kanektok River Kuskokwim Bay	- project initiated but not fully opperable in 1996 season - goal was to estimate daily escapement of chinook, sockeye, chum and pink salmon into Kanektok River.	June - July	QIRA	all aspects
				ADFG/CFMD	planning, supplies & advisor
				USFWS	planning & supplies
				BSFA	funding
Middle Fork Goodnews River Weir	mile 5 Middle Fork Goodnews River Kuskokwim Bay	- estimate daily escapement of chinook, sockeye, chum, and pink salmon into the Middle Fork Goodnews River. - estimate age, sex and length composition of chinook, sockeye and chum salmon salmon	June - Aug	ADFG/CFMD	all aspects
				USFWS BSFA	floating weir support

Agency Acronyms:

ADFG/CFMD = Commercial Fisheries Management and Development Division; Alaska Department of Fish and Game
ADFG/S = Subsistence Division; Alaska Department of Fish and Game
ADFG/SF = Sport Fish Division; Alaska Department of Fish and Game
AVCP = Association of Village Council Presidents
BSFA = Bering Sea Fishermen's Association
KNA = Kuskokwim River Native Association
QIRA = Quinhagak IRA
TCSTC = Takotna Community School and Training Center
USFWS = U.S. Fish and Wildlife Service

Table 2. Kuskokwim Area salmon entry permits issued by village, 1996

Village	Number of Entry Permits
Akiachak	64
Akiak	23
Aniak	10
Atmautluak	28
Bethel	167
Chefornak	3
Chuathbaluk	2
Eek	40
Goodnews Bay	29
Kalskags	8
Kasigluk	44
Kipnuk	17
Kongiganak	21
Kwethluk	58
Kwigillingok	18
Mekoryuk	2
Napakiak	39
Napaskiak	34
Nunapitchuk	48
Oscarville	2
Platinum	4
Quinhagak	83
Sleetmute	1
Tuluksak	27
Tuntutuliak	44
KUSKOKWIM AREA SUBTOTAL	**816**
Anchorage	11
Dillingham	1
Fairbanks	3
Manokotak	2
Togiak	1
NON-LOCAL ALASKA RESIDENTS SUBTOTAL	**18**
Valencia, CA	1
Dunwoody, GA	1
Honey In The Hills, FL	1
Paul Smiths, NY	1
Florence, OR	1
Tacoma, WA	1
NON-RESIDENT SUBTOTAL	**6**
TOTAL NUMBER OF PERMITS	**840**

Table 3. Kuskokwim Area commercial salmon roe harvest and fishing effort by period, 1996.

						Chinook		Chum		Coho	
District	Period	Date	Hours	Permits	Deliveries	Number	Lbs Roe	Number	Lbs Roe	Number	Lbs Roe
W-1	5	07/05	2	10	10			798	399		
	7	07/12	2	12	12			1,744	872		
W-1 Total			4	17	17			2,542	1,271		
W-2	1	06/24	2	6	6	145	102	613	334		
	2	07/02	2	4	4	175	161	376	306		
	3	07/05	2	3	3	8	3	606	412		
	4	07/08	4	4	4	42	38	877	507		
	5	07/12	4	4	4	60	42	758	470		
	6	07/16	4	1	1	5	18	336	211		
	7	07/19	4	3	3	9	18	444	377	47	35
	8	07/22	6	2	2			414	267	234	90
	9	07/25	8	3	3	2	6	367	214	700	288
	10	07/29	6	2	2			98	59	668	296
	11	07/31	6	1	1			148	89	152	89
W-2 Total			48	6	33	446	388	5,037	3,246	1,801	798
W-4	4	07/03	8	17	17			1,500	750		
Total all districts			60	39	67	446	388	9,079	5,267	1,801	798

Table 4. Exvessel value of Kuskokwim Area salmon catch by District, 1996.

	Chinook	Sockeye	Coho	Pink	Chum	Total
Lower Kuskowkim River, District W-1			1996			
Fish	6,972	33,404	930,131	1,621	200,285	1,172,413
Pounds	102,893	242,939	7,298,732	6,202	1,424,805	
Price	0.23	0.40	0.25	0.12	0.12	
Value	$23,665	$97,176	$1,824,683	$744	$170,977	$2,117,245
Lbs. Roe	0	0	0	0	1,271	1,271
Price					$2.00	
Value	$0	$0	$0	$0	$2,542	$2,542
			Ave. 1988-95			
Fish	35,268	71,949	527,212	6,671	519,703	1,160,803
Value	$0	$468,803	$2,210,342	$2,245	$1,066,379	$3,747,769
Middle Kuskokwim River, District W-2			1996			
Fish	1	108	5,379	0	13	5,501
Pounds	16	858	42,100	0	96	
Price	0.44	0.52	0.25		0.11	
Value	$7	$446	$10,525	$0	$11	$10,989
Lbs. Roe	388	0	798	0	3,246	4,432
Price	$2.51		$2.00		$2.95	
Value	$974	$0	$1,596	$0	$9,576	$12,146
			Ave. 1988-95			
Fish	1,375	1,757	21,353	31	16,454	40,970
Value	$16,029	$11,204	$80,390	$16	$27,636	$135,275
Quinhagak, District W-4			1996			
Fish	14,165	57,665	118,718	20	81,505	272,073
Pounds	227,021	413,294	982,648	59	613,232	
Price	0.27	0.40	0.25	0.10	0.10	
Value	$61,296	$165,318	$245,662	$6	$61,323	$533,604
Lbs. Roe	0	0	0	0	750	750
Price					$2.00	
Value	$0	$0	$0	$0	$1,500	$1,500
			Ave. 1988-95			
Fish	18,993	57,728	59,379	19,409	53,484	208,993
Value	$216,269	$316,978	$291,014	$5,168	$98,754	$928,183
Goodnews Bay, District W-5			1996			
Fish	1,375	30,717	43,836	22	11,093	87,043
Pounds	23,806	218,567	429,253	70	81,950	
Price	0.25	0.40	0.28	0.06	0.11	
Value	$5,952	$87,427	$120,191	$4	$9,015	$222,588
			Ave. 1988-95			
Fish	2,919	42,082	23,633	4,827	19,157	92,618
Value	$36,498	$256,767	$131,973	$1,451	$40,012	$466,701
Kuskowkim Area Total			1996			
Fish	22,513	121,894	1,098,064	1,663	292,896	1,537,030
Pounds	353,736	875,658	8,752,733	6,331	2,120,083	
Price	0.26	0.40	0.25	0.12	0.11	
Value	$90,920	$350,366	$2,201,061	$754	$241,325	$2,884,426
Lbs. Roe	388	0	798	0	5,267	
Price	2.51		2.00		2.59	
Value	$974		$1,596		$13,618	$16,188
Total $	$91,893	$350,366	$2,202,657	$754	$254,943	$2,900,613
			Ave. 1988-95			
Fish	58,555	173,516	631,577	30,938	608,798	1,503,384
Value	$268,796	$1,053,752	$2,713,719	$8,880	$1,232,781	$5,277,928

Table 5. Salmon processors and associated data, Kuskokwim Area, 1996.

Processor	Product	District
Hammer Inc. P.O. Box Bethel, AK 99559	Fresh Salmon Smoked Salmon	1
Inlet Fish Producers, Inc. P.O. Box 578 Bethel, AK 99559	Frozen Salmon Fresh Salmon Salmon Roe	1, 2, 4 and 5
Inlet Salmon P.O. Box 530 Kenai, AK 99611	Frozen Salmon Fresh Salmon Salmon Roe	5
Korthius P.O. Box 309 Bethel, AK 99559	Smoked Salmon	1
North Alaska Fisheries, Inc. P.O. Box 92737 Anchorage, AK 99509	Fresh Salmon Frozen Salmon Salmon Roe	1
Pac Atlantic Fisheries, Inc. 1818 Westlake Ave. North #408 Seattle, WA 98109	Fresh Salmon Frozen Salmon Salmon Roe	1, 4 and 5
Trans-Ocean Seafood Sales P.O. Box 64 Aniak, AK 99557	Salmon Roe	2
Woodbine Alaska Fish Co. P.O. Box 218 Egegik, AK 99579	Frozen Salmon Canned Salmon Salmon Roe	1, 2, 4 and 5

Table 6. Lower Kuskokwim River, District 1, commercial salmon harvest and fishing effort by period, 1996.

Fishing				Permit	Chinook		Sockeye		Chum[a]		Pink		Coho	
Period	Date	Hours	Permits	Hours	Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE
1	6/17	2	245	490	2,045	4.2	1,850	3.8	11,560	23.6	0	0.0	0	0.0
2	6/20	2	283	566	2,046	3.6	6,423	11.3	27,442	48.5	0	0.0	0	0.0
3	6/24	1.5	240	360	666	1.9	4,420	12.3	19,438	54.0	0	0.0	0	0.0
4	7/2	2	224	448	545	1.2	3,962	8.8	20,915	46.7	0	0.0	0	0.0
5	7/5	2	194	388	316	0.8	3,481	9.0	17,651	45.5	0	0.0	2	0.0
6	7/8	2	211	422	178	0.4	6,795	16.1	18,801	44.6	0	0.0	24	0.1
7	7/12	2	237	474	230	0.5	3,781	8.0	26,468	55.8	0	0.0	1,608	3.4
8	7/16	2	197	394	87	0.2	602	1.5	15,192	38.6	0	0.0	4,675	11.9
9	7/19	3	267	801	164	0.2	298	0.4	13,390	16.7	0	0.0	14,746	18.4
10	7/22	6	417	2,502	183	0.1	639	0.3	14,504	5.8	236	0.1	50,443	20.2
11	7/25	8	487	3,896	124	0.0	256	0.1	9,024	2.3	357	0.1	113,637	29.2
12	7/29	6	526	3,156	97	0.0	186	0.1	3,828	1.2	580	0.2	144,773	45.9
13	7/31	6	464	2,784	52	0.0	92	0.0	1,541	0.6	263	0.1	122,946	44.2
14	8/3	6	541	3,246	59	0.0	129	0.0	1,097	0.3	43	0.0	132,540	40.8
15	8/7	6	514	3,084	43	0.0	73	0.0	581	0.2	47	0.0	94,332	30.6
16	8/10	6	502	3,012	45	0.0	60	0.0	797	0.3	39	0.0	83,653	27.8
17	8/13	6	471	2,826	25	0.0	82	0.0	296	0.1	27	0.0	70,053	24.8
18	8/16	6	459	2,754	28	0.0	147	0.1	215	0.1	4	0.0	49,012	17.8
19	8/20	6	400	2,400	19	0.0	83	0.0	51	0.0	12	0.0	25,870	10.8
20	8/23	6	293	1,758	9	0.0	22	0.0	23	0.0	10	0.0	13,133	7.5
21	8/26	6	209	1,254	11	0.0	23	0.0	13	0.0	3	0.0	8,684	6.9
	Total	92.5	620	37,015	6,972		33,404		202,827		1,621		930,131	25.1

[a] Includes estimates of the number of chum salmon harvested for roe-only sales during periods 5 and 7.

Table 7. Middle Kuskokwim River, District 2, commercial salmon harvest and fishing effort by period, 1996.

				CHINOOK		SOCKEYE		COHO		CHUM	
PERIOD	DATE	HOURS	PERMITS	NUMBER	CPUE	NUMBER	CPUE	NUMBER	CPUE	NUMBER	CPUE
01	06/24	2	6	145	12.08	69	5.75			613	51.08
02	07/02	2	4	175	21.88	109	13.63			376	47.00
03	07/05	2	3	8	1.33	38	6.33			606	101.00
04	07/08	4	4	42	2.63	92	5.75			877	54.81
05	07/12	4	4	60	3.75	56	3.50			758	47.38
06	07/16	4	1	5	1.25	33	8.25	3	0.75	336	84.00
07	07/19	4	3	9	.75	9	.75	51	4.25	444	37.00
08	07/22	6	2			6	.50	234	19.50	414	34.50
09	07/25	8	3	2	.08	5	. 21	700	29.17	367	15.29
10	07/29	6	2	1	.08	2	17	668	55.67	98	8.17
11	07/31	6	1			2	.33	162	27.00	148	24.67
12	08/10	6	2					787	65.58		
13	08/13	6	5			1	.03	1,761	58.70	5	.17
14	08/16	6	2					590	49.17	8	.67
15	08/20	6	3			52	2.89	1,063	59.06		
16	08/23	6	2					620	51.67		
17	08/26	6	5					541	18.03		
TOTALS		84	8	447	.67	474	.71	7,180	10.67	5,050	7.52

NOTE: Periods 01 through 11 include estimates for number of chinook, sockeye, chum and coho salmon from salmon roe deliveries.

Table 8. Executive summary of Working Group and Department actions, 1996.

DATE	Comment
22-23 March	A letter from Inlet Salmon to William Hensley, Commissioner of the State Department of Commerce and Economic Development was reviewed. Inlet Salmon filed for Chapter 11 bankruptcy protection, due partially to large losses in their Bethel operations. The letter explained the problems facing the Kuskokwim Area fishery and what they believed was necessary to make the fishery viable for the future. The Working Group passed a motion that if Inlet Salmon is the only major processor on the Kuskokwim River and the salmon run strength is adequate, ADF&G will consider two or three openings between June 17 and June 24 for no more than 400,000 pounds harvest per opening. A short presentation was made on the 1996 salmon run outlook (ADF&G).
15 June	The Working Group heard reports from ADF&G and subsistence fishers on the status of the Kuskokwim River salmon runs and the subsistence fishery. Dept. recommendation: Two hour period in District W-1, downstream of Bethel on 17 June Actual outcome: Two hour period in District W-1, downstream of Bethel on 17 June
25 June	Dept. recommendation: The Kuskokwim River remain closed to commercial fishing until July 1 when it may be possible to determine the strength of the Aniak River chum salmon escapement. Working Group recommendation: Working Group to meet again on July 1 Actual outcome: Working Group to meet again on July 1
1 July	Dept. recommendation: Two hour period in Districts W-1 and W-2 on 2 July and another period of 5 July with length to be determined by processing capacity. Working Group recommendation: Two hour period in Districts W-1 and W-2 on 2 July and another period of 5 July with length to be determined by processing capacity. Actual outcome: Two hour periods in Districts W-1 and W-2 on 2 July and 5 July
6 July	Dept. recommendation: Two hour period in Districts W-1 and W-2 on 8 July. ADF&G would accept a four hour period in W-2 on 8 July. Reopen Districts W-1 and W-2 on 11 July with length of opening to be determined by available processing capacity. Working Group recommendation: Two hour period in Districts W-1 and W-2 on 8 July. Reopen Districts W-1 and W-2 on 11 July with length of opening to be determined by available processing capacity. If a biological concern were to develop, ADF&G would request a Working Group meeting before July 11 to reassess the salmon runs. Actual outcome: Two hour periods in Districts W-1 and four hour periods in District W-2 on 8 July and 12 July.

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Table 8. (page 2 of 3)

DATE	Comment
8 July	Business meeting to review the Working Group By-laws, consider Orutsararmuit Native Council's (ONC) application for Working Group membership, and review the Kuskokwim River Salmon Management Plan regulation. The Working Group adopted a new by-law limiting the Working Group membership to twelve member organizations. ONC's application for membership was not approved. The Working Group decided to review the Kuskokwim River Salmon Management Plan at a future business meeting.
13 July	Dept. recommendation: Three hour period in District W-1 and a four hour period in W-2 on 16 July. Reopen Districts W-1 and W-2 on 19 July or 20 July with length of opening to be determined by available processing capacity. Working Group recommendation: Three hour period in District W-1 and a four hour period in District W-2 on 16 July. Reopen Districts W-1 and W-2 on 19 July or 20 July with length of opening to be determined by available processing capacity. Actual outcome: Two hour period in Districts W-1 and a four hour period in District W-2 on 16 July and a three hour period in District W-1 and a four hour period in District W-2 on 19 July.
17 July	Business meeting: Joe Lomack (Kuskokwim Fishermen's Cooperative) and Stuart Currie (processors) were re-elected Co-Chairs, Jim Robinette was appointed Upriver Fishermen alternate, the Western Alaska Salmon Coalition (WASCO) resigned from the Working Group, ONC was accepted as a non-voting Working Group member and a letter was authorized to solicit nominations for an Elder representative.
20 July	Dept. recommendation: Six hour period in Districts W-1 and W-2 on 22 July Working Group recommendation: Six hour period in Districts W-1 and W-2 on 22 July Actual outcome: Six hour period in Districts W-1 and W-2 on 22 July
23 July	Dept. recommendation: Six hour period in Districts W-1 and W-2 on 25 July Working Group recommendation: Eight hour period in Districts W-1 and W-2 on 25 July Actual outcome: Eight hour period in Districts W-1 and W-2 on 25 July
26 July	Dept. recommendation: Six hour period in Districts W-1 and W-2 on 29 July Working Group recommendation (#1): Six hour period in District W-1 on 27 July and a six hour period in Districts W-1 and W-2 on 29 July - The Department vetoed the recommendation. Working Group recommendation (#2): Six hour period in Districts W-1 and W-2 on 29 July Actual outcome: Six hour period in Districts W-1 and W-2 on 29 July

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Table 8. (page 3 of 3)

DATE	Comment
30 July	Dept. recommendation: Six hour period in District W-1 on 31 July and a six hour period in Districts W-1 and W-2 on 3 August Working Group recommendation: Six hour period in Districts W-1 and W-2 on 31 July and a six hour period in District W-1 on 3 August Actual outcome: Six hour period in Districts W-1 and W-2 on 31 July and a six hour period in District W-1 on 3 August
5 August	Dept. recommendation: Six hour period in District W-1 on 7 August Working Group recommendation (#1): Six hour periods in District W-1 on 6 August and 9 August - Motion failed due to lack of consensus. Working Group recommendation (#2): Six hour period in District W-1 and W-2 on 7 August Actual outcome: Six hour period in District W-1 on 7 August
8 August	Dept. recommendation: Six hour period in Districts W-1 and W-2 on 10 August Working Group recommendation: Six hour period in Districts W-1 and W-2 on 10 August Actual outcome: Six hour period in Districts W-1 and W-2 on 10 August
12 August	Dept. recommendation: Six hour period in Districts W-1 and W-2 on 14 August Working Group recommendation: Six hour periods in Districts W-1 and W-2 on 13 August and 16 August Actual outcome: Six hour periods in Districts W-1 and W-2 on 13 August and 16 August
19 August	Dept. recommendation: Six hour periods in Districts W-1 and W-2 on 20 August and 23 August Working Group recommendation: Six hour periods in Districts W-1 and W-2 on 20 August and 23 August Actual outcome: Six hour periods in Districts W-1 and W-2 on 20 August and 23 August
24 August	Dept. recommendation: Six hour period in Districts W-1 and W-2 on 26 August and that the Kuskokwim River remain closed to commercial fishing after 26 August Working Group recommendation: Six hour period in Districts W-1 and W-2 on 26 August and to close the season after 26 August Actual outcome: Six hour period in Districts W-1 and W-2 on 26 August. Season closed on 1 September.
9 November	Business meeting: Topics included a review of the 1996 Kuskokwim River Salmon fishery, the 1997 Kuskokwim River Salmon Management Plan, a Salmon Roe Fishery Management Plan proposal to the Board of Fish, the December 1997 Board of Fish meeting, Working Group By-laws (need for review), ONC's request for a voting seat (placed on next meeting agenda), and Working Group support for reestablishment of the Bethel sonar project.

Table 9. Peak aerial survey salmon escapement estimates in Kuskokwim Area spawning tributaries by species, 1996[a].

Location	Date	Chinook	Sockeye	Coho	Chum
KUSKOKWIM RIVER:					
Aniak River	22-Jul	3,496	2,535	na	16,791
Salmon River (Aniak)	22-Jul	983	500	na	2,800
Holokuk River	23-Jul	85	0	na	100
Oskawalik River[b]	23-Jul	32	0	na	886
Oskawalik River[b]	03-Sep	na	na	90	na
Holokuk River	03-Sep	na	na	3,015	na
Holitna River	03-Sep	na	na	1,077	na
Kwethluk River	04-Sep	na	na	5,827	na
Tuluksak River	08-Sep	na	na	914	na
KUSKOKWIM BAY:					
Kanektok River	09-Jul	6,107	22,020	na	7,040
Kinegnak River	09-Jul	14	2,060	na	2,510
Salmon River	09-Jul	0	550	na	580
Arolik River	23-Jul	1,120	2,300	na	5,127
Goodnews River[b]	06-Sep	na	na	10,334	na
Middle Fork Goodnews River[b]	06-Sep	na	na	700	na
Kanektok River	11-Sep	na	32,000	23,656	na

[a] Peak aerial salmon escapement index count. Aerial index counts do not represent total escapement, but reflect annual spawner abundance trends when made using standard survey methods under acceptable conditions.

[b] Survey conditions rated poor.

Table 10. Daily and cumulative estimates of fish passage at the Aniak River sonar site, 1996

Date	Daily Count	Cumulative Count	Percent Passage
21-Jun	904	904	0
22-Jun	2,668	3,572	1
23-Jun	3,583	7,155	2
24-Jun	3,468	10,623	4
25-Jun	2,155	12,778	4
26-Jun	2,056	14,834	5
27-Jun	6,784	21,618	7
28-Jun	8,468	30,086	10
29-Jun	4,552	34,638	11
30-Jun	10,142	44,780	15
1-Jul	1,195	45,975	15
2-Jul	10,866	56,841	19
3-Jul	10,273	67,114	22
4-Jul	21,035	88,149	29
5-Jul	17,102	105,251	35
6-Jul	12,001	117,252	39
7-Jul	9,147	126,399	42
8-Jul	12,227	138,626	46
9-Jul	13,680	152,306	50
10-Jul	5,664	157,970	52
11-Jul	2,972	160,942	53
12-Jul	6,096	167,038	55
13-Jul	9,341	176,379	58
14-Jul	5,233	181,612	60
15-Jul	7,908	189,520	63
16-Jul	6,595	196,115	65
17-Jul	4,416	200,531	66
18-Jul	6,853	207,384	69
19-Jul	9,245	216,629	72
20-Jul	17,002	233,631	77
21-Jul	16,137	249,768	83
22-Jul	11,742	261,510	87
23-Jul	11,830	273,340	90
24-Jul	8,166	281,506	93
25-Jul	6,873	288,379	95
26-Jul	5,359	293,738	97
27-Jul	3,017	296,755	98
28-Jul	5,351	302,106	100

Table 11. Quinhagak, District 4, commercial salmon harvest and effort by period, 1996.

				Chinook		Sockeye		Coho		Pink		Chum	
Period	Date	Hours	Permits	Number	CPUE	Number	CPUE	Number	CPUE	Number	CPUE	Number	CPUE
1	6/22	12	69	4,752	5.74	1,146	1.38					6,984	8.43
2	6/25	8	73	2,125	3.64	3,043	5.21					6,662	11.41
3	6/29	12	120	2,378	1.65	6,304	4.38			20	0.01	8,441	5.86
4[a]	7/03	8	101	1,787	2.21	4,558	5.64					10,073	12.47
5	7/06	4	76	618	2.03	6,045	19.88					5,073	16.69
6	7/09	6	96	541	0.94	7,510	13.04					8,768	15.22
7	7/11	12	73	453	0.52	6,525	7.45	3	0.00			7,947	9.07
8	7/13	8	96	361	0.47	5,707	7.43	38	0.05			4,748	6.18
9	7/15	12	94	332	0.29	5,283	4.68	19	0.02			6,567	5.82
10	7/17	12	59	216	0.31	5,203	7.35	251	0.35			8,308	11.73
11	7/20	12	70	150	0.18	2,849	3.39	398	0.47			3,355	3.99
12	7/23	12		No Commercial Fishing - No Buyer									
13	7/24	12	41	105	0.21	944	1.92	2,295	4.66			1,571	3.19
14	7/27	12	60	88	0.12	698	0.97	4,483	6.23			1,885	2.62
15	7/29	12	52	64	0.10	548	0.88	7,989	12.80			1,034	1.66
16	7/31	12	53	29	0.05	225	0.35	5,597	8.80			607	0.95
17	8/02	12	53	43	0.07	257	0.40	12,478	19.62			405	0.64
18	8/05	12	70	32	0.04	156	0.19	19,091	22.73			114	0.14
19	8/07	12	49	15	0.03	128	0.22	7,766	13.21			89	0.15
20	8/09	12	59	13	0.02	82	0.12	11,553	16.32			102	0.14
21	8/12	12	77	18	0.02	125	0.14	7,825	8.47			102	0.11
22	8/14	12	33	8	0.02	26	0.07	5,938	14.99			25	0.06
23	8/16	12	57	16	0.02	83	0.12	8,299	12.13			55	0.08
24	8/19	12	71	10	0.01	48	0.06	12,931	15.18			35	0.04
25	8/21	12	57	4	0.01	81	0.12	3,315	4.85			22	0.03
26	8/23	12	52	2	0.00	58	0.09	5,091	8.16			18	0.03
27	8/26	12	51	5	0.01	33	0.05	3,358	5.49			15	0.02
Total[a]		298	218	14,165		57,665		118,718		20		83,005	

a Total includes an estimated 1,500 chum salmon caught (determined by roe sold) during period 4.

Table 12. Goodnews Bay, District 5, commercial salmon harvest and effort by period, 1996.

				Chinook		Sockeye		Coho		Pink		Chum	
Period	Date	Hours	Permits	Number	CPUE	Number	CPUE	Number	CPUE	Number	CPUE	Number	CPUE
1	6/28	7	26	307	1.69	2,008	11.03					1,605	8.82
2	7/02	12	31	223	0.60	4,777	12.84					2,208	5.94
3	7/05	12	26	154	0.49	4,900	15.71					1,717	5.50
4	7/08	12	40	125	0.26	4,366	9.10					1,809	3.77
5	7/11	12	32	187	0.49	3,651	9.51					1,009	2.63
6	7/15	12	35	65	0.15	3,080	7.33	13	0.03			1,279	3.05
7	7/18	12	34	78	0.19	1,962	4.81	18	0.04			709	1.74
8	7/20	12		No Commercial Fishing - No Buyer									
9	7/25	12	28	53	0.16	1,678	4.99	632	1.88	22	0.07	262	0.58
10	7/27	12	25	74	0.25	1,271	4.24	715	2.38			173	0.51
11	7/30	12	19	19	0.08	790	3.46	1,461	6.41			116	0.18
12	8/05	12	25	17	0.06	301	1.00	2,069	6.90			54	0.16
13	8/08	12	23	13	0.05	307	1.11	1,978	7.17			44	0.05
14	8/10	12	26	14	0.04	218	0.70	3,169	10.16			16	0.14
15	8/12	12	29	10	0.03	458	1.32	6,488	18.64			50	0.05
16	8/14	12	28	7	0.02	234	0.70	4,644	13.82			17	0.03
17	8/16	12	30	7	0.01	223	0.62	7,321	20.34			10	0.01
18	8/19	12	28	3	0.03	173	0.51	5,628	16.75			4	0.01
19	8/21	12	29	9	0.02	119	0.34	4,967	14.27			3	0.02
20	8/23	12	27	5	0.03	135	0.42	2,824	8.72			8	0.00
21	8/26	12	13	5		66	0.42	1,909	12.24				
Total		247	53	1,375		30,717		43,836		22		11,093	

Table 13. Middle Fork Goodnews River weir project daily counts, 1996

DATE	CHINOOK		SOCKEYE		CHUM		COHO		PINK	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
6/19	6	6	69	69	2	2				
6/20	7	13	126	195	7	9				
6/21	11	24	387	582	15	24				
6/22	25	49	832	1,414	53	77				
6/23	23	72	586	2,000	57	134				
6/24	24	96	852	2,852	170	304				
6/25	17	113	1,368	4,220	255	559				
6/26	57	170	1,804	6,024	278	837				
6/27 [a]	37	207	1,416	7,440	172	1,009				
6/28 [a]	34	241	1,676	9,116	181	1,190				
6/29 [a]	49	290	1,156	10,272	158	1,348				
6/30 [a]	68	358	1,239	11,511	266	1,614				
7/01	40	398	2,585	14,096	529	2,143				
7/02	39	437	2,361	16,457	384	2,527				
7/03	37	474	3,174	19,631	926	3,453			18	18
7/04	125	599	2,963	22,594	1,965	5,418			176	194
7/05	115	714	3,156	25,750	1,873	7,291			96	290
7/06	207	921	3,978	29,728	1,952	9,243			160	450
7/07	159	1,080	4,063	33,791	2,874	12,117			152	602
7/08	99	1,179	2,860	36,651	1,507	13,624			103	705
7/09	78	1,257	2,312	38,963	1,392	15,016			186	891
7/10	177	1,434	2,635	41,598	1,820	16,836			421	1,312
7/11	269	1,703	1,576	43,174	1,353	18,189			103	1,415
7/12	186	1,889	1,719	44,893	494	18,683			86	1,501
7/13 [a]	73	1,962	1,451	46,344	933	19,616				
7/14 [a]	71	2,033	1,429	47,773	1,055	20,671				
7/15 [a]	74	2,107	1,301	49,074	1,219	21,890				
7/16 [a]	62	2,169	1,160	50,234	1,403	23,293				
7/17 [a]	87	2,256	979	51,213	1,459	24,752				
7/18 [a]	59	2,315	803	52,016	979	25,731				
7/19 [a]	49	2,364	759	52,775	947	26,678				
7/20	60	2,424	648	53,423	1,680	28,358			195	1,696
7/21	69	2,493	960	54,383	2,163	30,521			312	2,008
7/22	46	2,539	601	54,984	1,363	31,884			514	2,522
7/23	91	2,630	500	55,484	1,646	33,530			1,088	3,610
7/24	47	2,677	410	55,894	1,449	34,979	4	4	2,411	6,021
7/25	41	2,718	468	56,362	667	35,646	22	26	1,468	7,489
7/26	17	2,735	227	56,589	502	36,148	30	56	1,558	9,047
7/27	45	2,780	250	56,839	574	36,722	25	81	1,000	10,047
7/28	42	2,822	200	57,039	557	37,279	43	124	551	10,598
7/29 [a]	17	2,839	106	57,145	555	37,834				
7/30 [a]	14	2,853	88	57,233	465	38,299				
7/31 [a]	8	2,861	66	57,299	345	38,644				
8/01 [a]	6	2,867	49	57,348	240	38,884				
8/02 [a]	5	2,872	44	57,392	202	39,086				
8/03 [a]	4	2,876	31	57,423	175	39,261				
8/04 [a]	4	2,880	26	57,449	181	39,442				
8/05 [a]	3	2,883	22	57,471	111	39,553				
8/06 [a]	3	2,886	13	57,484	105	39,658				
8/07 [a]	3	2,889	22	57,506	67	39,725				
8/08	7	2,896	59	57,565	63	39,788	191	315	372	10,970
8/09	2	2,898	52	57,617	77	39,865	303	618	331	11,301
8/10	5	2,903	35	57,652	59	39,924	302	920	506	11,807
8/11	6	2,909	119	57,771	144	40,068	455	1,375	601	12,408
8/12	4	2,913	65	57,836	62	40,130	281	1,656	244	12,652
8/13	2	2,915	68	57,904	52	40,182	408	2,064	423	13,075
8/14	1	2,916	43	57,947	26	40,208	333	2,397	255	13,330
8/15	3	2,919	88	58,035	56	40,264	415	2,812	264	13,594
8/16	1	2,920	55	58,090	36	40,300	464	3,276	234	13,828
8/17	2	2,922	41	58,131	43	40,343	432	3,708	107	13,935
8/18	1	2,923	37	58,168	37	40,380	673	4,381	105	14,040
8/19	1	2,924	34	58,202	31	40,411	1,871	6,252	121	14,161
8/20	2	2,926	28	58,230	18	40,429	805	7,057	58	14,219
8/21	3	2,929	12	58,242	13	40,442	769	7,826	109	14,328
8/22	0	2,929	14	58,256	7	40,449	1,671	9,497	118	14,446
8/23	1	2,930	8	58,264	1	40,450	202	9,699	63	14,509

[a] Weir not in operation. Daily estimated counts of chinook, sockeye, and chum salmon based on average run timing 1981 - 1995. No escapement estimates for pink and coho salmon due to insufficient run timing data.

Table 14. Preliminary projections of the 1996 Kuskokwim Area commercial salmon harvest in thousands of fish by species and management district.[a]

	MANAGEMENT DISTRICT			KUSKOKWIM
	KUSKOKWIM RIVER	QUINHAGAK	GOODNEWS BAY	AREA TOTAL
CHINOOK	20 - 45	10 - 20	2 - 3	32 - 68
SOCKEYE	30 - 60	50 - 80	35 - 70	115 - 210
COHO	500 - 700	50 - 90	15 - 30	565 - 820
PINK[b]	30 - 3	10 - 60	1 - 18	41 - 81
CHUM	100 - 300	60 - 90	10 - 20	170 - 410
TOTAL	680 - 1108	180 - 340	63 - 141	923 - 1589

a Except as noted, all catches are based on catches from 1985 through 1995

b Kuskokwim Area pink salmon display a strong odd-even year cycle; the 1996 projections are based on the even years catches only.

Table 15. 1996 Kuskokwim Area subsistence salmon project sampling summary

COMMUNITY	Total HH	CALENDARS Mailed	CALENDARS Returned	POSTCARDS Mailed	POSTCARDS Returned	Household Surveys	Phone Surveys	Any Information	Subsist. Fished
Kipnuk	82	5	0	0	0	0	0	0	
Kwigillingok	36	3	0	1	1	0	0	1	1
Kongiganak	58	49	1	18	2	28	0	42	22
NORTH KUSKOKWIM BAY	176	57	1	19	3	28	0	43	23
Tuntutuliak	64	51	15	7	1	52	0	59	48
Eek	69	51	22	8	1	46	0	64	40
Kasigluk	78	8	4	1	0	0	0	5	5
Nunapitchuk	92	65	18	14	5	70	0	86	65
Atmautluak	54	44	5	12	1	38	0	45	31
Napakiak	67	48	13	14	1	50	0	56	35
Napaskiak	81	64	10	21	1	46	0	70	44
Oscarville	11	9	6	0	0	11	0	11	7
Bethel	1,569	372	69	730	102	0	415	671	288
Kwethluk	131	101	27	37	4	71	0	98	71
Akiachak	106	85	8	24	4	67	0	89	65
Akiak	58	50	8	9	3	40	0	52	38
Tuluksak	66	54	12	14	1	49	0	54	43
LOWER KUSKOKWIM RIVER	2,446	1,002	217	891	124	540	415	1,360	780
Lower Kalskag	70	49	8	21	4	42	0	56	37
Upper Kalskag	34	28	8	10	1	22	0	26	16
Aniak	148	109	16	17	3	119	0	131	78
Chuathbaluk	29	20	4	6	2	20	0	27	15
MIDDLE KUSKOKWIM RIVER	281	206	36	54	10	203	0	240	146
Crooked Creek	26	19	3	6	1	20	0	22	17
Red Devil	21	17	4	4	1	15	0	18	11
Sleetmute	38	34	7	12	5	24	0	30	24
Stony River	16	10	1	3	0	12	0	15	10
Lime Village	14	9	0	13	2	0	0	2	2
McGrath	119	37	5	17	8	0	93	115	34
Takotna	12	0	0	2	2	2	0	12	1
Nikolai	25	16	4	2	1	21	1	23	12
Telida	3	0	0	0	0	0	0	0	
UPPER KUSKOKWIM RIVER	274	142	24	59	20	94	94	237	111
Quinhagak	124	98	12	44	5	75	0	93	70
Goodnews Bay	60	33	3	7	0	43	0	53	21
Platinum	9	4	0	9	1	0	0	1	1
SOUTH KUSKOKWIM BAY	193	135	15	60	6	118	0	147	92
Mekoryuk	54	13	1	0	0	0	0	1	1
Newtok	49	1	0	0	0	0	0	0	
Nightmute	25	1	0	0	0	0	0	0	
Toksook Bay	74	10	2	0	0	0	0	2	2
Tununak	69	1	0	0	0	0	0	0	
BERING SEA COAST	271	26	3	0	0	0	0	3	3
KUSKOKWIM AREA TOTALS	3,641	1,568	296	1,083	163	983	509	2,030	1,155

Table 16. 1996 Kuskokwim Area subsistence salmon harvests.

COMMUNITY	Households Total	Households Contacted	CHINOOK Reported Harvest	CHINOOK Estimated Total *	CHUM Reported Harvest	CHUM Estimated Total *	SOCKEYE Reported Harvest	SOCKEYE Estimated Total *	COHO Reported Harvest	COHO Estimat. Total *
Kipnuk	82	0	0		0		0		0	
Kwigillingok	36	1	15	15	30	30	10	10	5	5
Kongiganak	58	42	567	830	929	1,331	508	722	299	421
N. KUSKOKWIM BAY	176	43	582	845	959	1,361	518	732	304	426
Tuntutuliak	64	58	3,567	3,996	5,095	5,744	1,340	1,501	1,168	1,311
Eek	69	61	2,200	2,568	789	923	408	478	332	389
Kasigluk	78	5	579	579	1,196	1,196	588	588	368	368
Nunapitchuk	92	85	2,954	3,234	5,320	5,833	1,586	1,735	1,199	1,310
Atmautluak	54	43	1,373	1,752	2,038	2,599	1,109	1,416	409	522
Napakiak	67	52	2,729	3,784	3,088	4,249	785	1,083	432	600
Napaskiak	81	68	3,501	4,368	3,903	4,886	1,913	2,398	311	390
Oscarville	11	9	775	996	1,207	1,552	165	212	15	19
Bethel	1,569	518	10,877	21,332	9,200	16,844	3,793	7,310	7,114	13,325
Kwethluk	131	93	6,256	9,183	8,080	11,870	2,744	4,035	2,172	3,195
Akiachak	106	86	4,118	5,209	3,937	4,993	2,060	2,607	671	850
Akiak	58	49	3,688	4,569	3,746	4,640	1,180	1,449	779	972
Tuluksak	66	53	2,418	3,073	2,432	3,095	827	1,051	862	1,091
LOWER KUSKOKWIM	2,446	1,180	45,035	64,643	50,031	68,424	18,498	25,863	15,832	24,342
Lower Kalskag	70	53	2,191	2,870	2,567	3,357	875	1,144	780	1,022
Upper Kalskag	34	26	978	1,351	1,174	1,621	213	294	261	360
Aniak	148	128	2,832	3,223	7,524	8,533	1,137	1,290	2,360	2,679
Chuathbaluk	29	27	1,084	1,152	2,228	2,365	701	744	413	440
MIDDLE KUSKOKWIM	281	234	7,085	8,596	13,493	15,876	2,926	3,472	3,814	4,501
Crooked Creek	26	22	686	855	274	347	240	304	135	171
Red Devil	21	15	236	337	551	787	684	977	892	1,274
Sleetmute	38	30	984	1,230	972	1,215	1,043	1,304	677	846
Stony River	16	15	537	597	399	443	1,096	1,218	519	571
Lime Village	14	2	48	48	500	500	500	500	0	
McGrath	119	110	1,160	1,273	199	218	0		886	972
Takotna	12	12	0		10	10	0		0	
Nikolai	25	21	251	305	205	249	0		53	64
Telida	3	0	0		0		0		0	
UPPER KUSKOKWIM	274	227	3,902	4,645	3,110	3,769	3,563	4,303	3,162	3,898
KUSKOKWIM RIVER	3,177	1,684	56,604	78,729	67,593	89,430	25,505	34,370	23,112	33,167
Quinhagak	124	86	2,364	3,164	750	988	310	405	1,145	1,497
Goodnews Bay	60	50	285	403	158	214	306	411	217	293
Platinum	9	1	12	12	5	5	7	7	59	59
S. KUSKOKWIM BAY	193	137	2,661	3,579	913	1,207	623	823	1,421	1,849
Mekoryuk	54	1	0		0		0		3	3
Newtok	49	0	0		0		0		0	
Nightmute	25	0	0		0		0		0	
Toksook Bay	74	2	45	45	124	124	5	5	135	135
Tununak	69	0	0		0		0		0	
BERING SEA COAST	271	3	45	45	124	124	5	5	138	138
KUSKOKWIM TOTALS	3,641	1,824	59,310	82,353	68,630	90,761	26,133	35,198	24,671	35,154

* If fewer than 30 households or less than 50% of the community were contacted, then reported harvest is used for estimated harvest.

Table 19. Kuskokwim area Pacific herring age frequency by district, 1996.

District	Age (years) 2	3	4	5	6	7	8	9	10	11	12	13+	Total Sample Size
Commercial catch[a]													
Security Cove					1.2	6.7	36.5	31.6	5.2	5.8	7.3	5.8	345
Goodnews Bay				0.7	4.3	5.0	34.6	21.0	5.5	10.7	9.3	8.8	419
Cape Avinof													
Kwigillingok				0.5	6.7	5.0	34.2	21.4	6.7	11.0	9.5	5.0	401
Kipnuk				0.3	2.9	4.1	22.9	25.9	6.2	15.3	15.9	6.5	340
Nelson Island					1.7	1.7	20.6	24.1	9.0	12.2	14.7	15.9	402
Nunivak Island				0.2	3.9	3.3	23.6	12.7	3.3	7.8	13.9	31.4	487
All Districts				0.3	3.5	4.2	28.6	22.1	5.9	10.4	11.8	13.2	2,394
Test Fishery[b]													
Security Cove		0.7	7.9	16.2	15.6	8.5	21.3	17.5	1.5	2.4	3.3	5.3	1,337
Goodnews Bay		0.2	4.9	21.7	12.8	6.7	23.0	15.6	2.8	5.5	2.7	4.1	1,103
Cape Avinof		1.9	6.1	20.9	22.6	7.5	21.0	8.6	3.2	3.4	2.7	2.2	1,018
Nelson Island		2.2	4.5	19.4	22.4	3.8	21.2	10.9	2.6	3.6	4.3	5.2	1,853
Nunivak Island		0.5	3.6	20.9	27.2	6.2	20.6	7.1	2.0	2.5	3.2	6.3	843
All Districts		1.2	5.5	19.6	19.9	6.3	21.4	12.3	2.4	3.5	3.4	4.7	6,154

a Commercial drift gill net
b ADF&G variable mesh gill net

Table 20. Kuskokwim area Pacific herring proportion of biomass by age class, 1996.

District	Age (years) 2	3	4	5	6	7	8	9	10	11	12	13+	Total weight (st)
Commercial catch[a]													
Security Cove					1.0	5.3	34.0	32.2	5.4	6.0	8.5	7.6	1,859
Goodnews Bay				0.5	3.2	4.2	31.7	20.5	5.9	11.9	11.4	10.8	1,205
Cape Avinof				0.2	2.4	3.4	20.6	24.8	6.2	16.4	17.6	8.5	820
Nelson Island					1.3	1.4	18.0	22.4	8.7	12.9	16.3	19.0	1,031
Nunivak Island				0.1	2.5	2.4	20.4	12.0	3.2	8.2	15.1	36.1	101
All Districts				0.2	1.8	3.9	27.8	25.8	6.3	10.5	12.3	11.5	5,016
Test Fishery[b]													
Security Cove		0.2	2.6	6.4	9.2	7.8	26.7	25.7	3.0	4.1	6.0	8.3	6,867
Goodnews Bay		0.1	3.3	14.7	9.7	6.5	24.3	18.8	4.2	7.4	3.9	7.3	6,315
Cape Avinof		0.7	3.4	14.5	19.7	7.5	24.4	11.5	4.6	5.4	4.4	4.0	4,500
Nelson Island		0.7	2.1	10.9	15.7	3.2	22.6	15.1	4.2	6.6	8.2	10.6	6,638
Nunivak Island		0.2	2.0	13.9	22.8	6.2	23.5	9.2	2.9	3.7	5.1	10.6	4,195
All Districts		0.4	2.7	11.7	14.5	6.2	24.4	17.0	3.8	5.6	5.7	8.3	28,515

a Commercial drift gill net
b ADF&G variable mesh gill net

Table 17. 1996 Kuskokwim Area subsistence salmon fishing gear types used.

Community	Number of Households Reporting Subsistence Fishing Gear Used [a]						
	Set net	Drift Net	Fish Wheel	Rod and Reel	Seine	Spear	Other
Kipnuk	0	0	0	0	0	0	0
Kwigillingok	0	1	0	0	0	0	0
Kongiganak	1	21	0	0	0	0	0
NORTH KUSKOKWIM BAY	1	22	0	0	0	0	0
Tuntutuliak	1	39	0	0	0	0	0
Eek	11	22	0	1	0	0	0
Kasigluk	0	0	0	0	0	0	0
Nunapitchuk	2	53	0	0	0	0	0
Atmautluak	2	21	0	0	0	0	0
Napakiak	15	31	0	0	0	0	0
Napaskiak	11	31	0	0	0	0	0
Oscarville	1	8	0	0	0	0	0
Bethel	23	157	0	61	1	0	0
Kwethluk	29	43	0	2	0	0	0
Akiachak	24	42	0	1	0	0	0
Akiak	12	28	0	1	0	0	0
Tuluksak	16	33	0	1	0	0	0
LOWER KUSKOKWIM RIVER	147	508	0	67	1	0	0
Lower Kalskag	21	22	0	0	0	0	0
Upper Kalskag	4	12	0	0	0	0	0
Aniak	12	40	3	30	0	0	0
Chuathbaluk	2	8	0	2	0	0	0
MIDDLE KUSKOKWIM RIVER	39	82	3	32	0	0	0
Crooked Creek	4	12	0	3	0	0	0
Red Devil	8	10	0	3	0	0	0
Sleetmute	10	15	2	6	0	0	0
Stony River	7	2	2	1	0	0	0
Lime Village	2	0	2	0	0	0	0
McGrath	3	1	1	2	0	0	0
Takotna	0	0	0	1	0	0	0
Nikolai	7	0	0	8	0	0	0
Telida	0	0	0	0	0	0	0
UPPER KUSKOKWIM RIVER	41	40	7	24	0	0	0
Quinhagak	12	41	0	11	0	0	0
Goodnews Bay	5	10	0	5	0	0	0
Platinum	1	1	0	0	0	0	0
SOUTH KUSKOKWIM BAY	18	52	0	16	0	0	0
Mekoryuk	0	0	0	0	0	0	0
Newtok	0	0	0	0	0	0	0
Nightmute	0	0	0	0	0	0	0
Toksook Bay	0	0	0	0	0	0	0
Tununak	0	0	0	0	0	0	0
BERING SEA COAST	0	0	0	0	0	0	0
KUSKOKWIM AREA TOTALS	246	704	10	138	1	0	0

a Households using more than one type of gear are listed for each gear type they reported.

Table 18. 1996 Subsistence salmon harvested in conjunction with commercial salmon fishing in the Kuskokwim Area.

	HOUSEHOLDS REPORTING		NUMBER OF SALMON REMOVED FROM COMMERCIAL CATCH FOR SUBSISTENCE USE			
	Commercial Fishing	Kept Commercial Caught Salmon for Subsistence	Chinook	Chum	Sockeye	Coho
Kongiganak	12	2	0	20	100	0
NORTH KUSKOKWIM BAY	12	2	0	20	100	0
Tuntutuliak	28	8	260	1,503	115	104
Eek	27	10	9	123	25	6
Kasigluk [a]						
Nunapitchuk	41	5	0	16	0	46
Atmautluak	22	10	27	40	28	16
Napakiak	21	4	1	0	0	8
Napaskiak	21	7	1	1	6	19
Oscarville	7	3	6	12	3	6
Bethel [a]						
Kwethluk	34	13	41	18	10	67
Akiachak	35	9	15	10	19	54
Akiak	19	4	0	10	2	4
Tuluksak	22	10	36	11	10	18
LOWER KUSKOKWIM RIVER	277	83	396	1,744	218	348
Lower Kalskag	2	2	2	100	20	0
Upper Kalskag	1	1	0	300	0	0
Aniak	5	3	143	717	100	345
Chuathbaluk	0	0	0	0	0	0
MIDDLE KUSKOKWIM RIVER	8	6	145	1,117	120	345
Quinhagak	50	13	30	102	1	13
Goodnews Bay	19	4	0	0	19	0
Platinum [a]						
SOUTH KUSKOKWIM BAY	69	17	30	102	20	13
KUSKOKWIM AREA TOTALS	366	108	571	2,983	458	706

a Data are based upon household surveys only and are not expanded. Kasigluk and Platinum were not surveyed. This survey question was not asked of households in Bethel or in communities outside of the commercial salmon fishing districts which included communities in the Upper Kuskokwim, and Bering Sea Coast regions.

Table 21. Summary of Pacific herring commercial harvest by fishing period for Kuskokwim Area fishing districts, Alaska, 1996.

District	Period	Date	Time	Total Hours	Harvest (st)
Security Cove	1	5/11	1300-1500	2.0	411.0
	2	5/12	1500-1830	3.5	1,443.0
			Total	5.5	1,854.0[a]
Goodnews Bay	1	5/16	1800-2200	4.0	71.1
	2	5/17	1900-2300	4.0	366.3
	3	5/18	0800-1200	4.0	32.9
	4	5/19	0800-1200	4.0	25.4
	5	5/19-20	2100-0100	4.0	83.1
	6	5/20	0930-1330	4.0	78.3
	7	5/21	1000-1400	4.0	122.7
	8	5/22	1030-1430	4.0	52.7
	9	5/23	1100-1400	4.0	23.2
	10	5/24	1100-1600	5.0	152.3
	11	5/25	1230-1630	4.0	196.5
			Total	45.0	1,204.5
Cape Avinof	1	5/19	0800-1400	6.0	6.0
	2	5/19-20	2100-0100	4.0	5.0
	3	5/20	0900-1300	6.0	3.7
	4	5/20-21	2200-0200	4.0	1.2
	5	5/21	1000-1600	6.0	10.7
	6	5/21-22	2300-0300	4.0	4.3
	7	5/22	1100-1700	6.0	59.2
	8	5/23	1100-1900	8.0	215.7
	9	5/24	0000-0600	6.0	284.7
	10	5/25	1300-1700	4.0	101.3
	11	5/26	1500-1800	3.0	127.8
			Total	57.0	819.6
Nelson Island	1	5/16	0700-1200	5.0	179.1
	2	5/16-17	2100-0100	4.0	80.6
	3	5/17	0900-1400	5.0	180.7
	4	5/17-18	2100-0300	6.0	340.2
	5	5/18	1000-1500	5.0	250.0
			Total	25.0	1,030.6
Nunivak Island	1	5/14	0600-1000	4.0	20.1
	2	5/14	1800-2400	6.0	34.2
	3	5/16	0900-1500	8.0	8.4
	4	5/17	0700-1300	6.0	0.0
	5	5/24	1400-2200	8.0	28.4
	6	5/27-6/5	1400-2200	224.0	9.8
			Total	256.0	100.8

a Does not include 5.0 st of waste

Table 22. Projections of Pacific herring spawning biomass and harvest for commercial fishing districts in the Kuskokwim Area, Alaska, 1997.

	1997 Projection[a]			
District	Biomass (st)	Threshold (st)[b]	Harvest (st)	Exploitation Rate (%)
Security Cove	4,640	1,200	928	20
Goodnews Bay	4,752	1,200	950	20
Cape Avinof	3,737	500	561	15
Nelson Island	5,094	3,000	764	15
Nunivak Island	3,801	1,500	760	20
Total	22,024		3,963	

a Preseason projection. Projection may be adjusted based on inseason biomass estimates.

b Threshold biomass needed to allow a commercial fishery from 5 AAC 27.060 Bering Sea Herring Fishery Management Plan

Table 23. The 1996 commercial salmon catch statistics for statistical area 335-11.

Fishing Period	Date	Hours	Permits	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum[a] Catch	Chum[a] CPUE	Pink Catch	Pink CPUE	Coho Catch	Coho CPUE
1	6/17	2	0	0	No Tenders / No Deliveries									
2	6/20	2	1	2	4	2.0	90	45.0	120	60.0	0	0.0	0	0.0
3	6/24	1.5	0	0	No Tenders / No Deliveries									
4	7/2	2	10	20	39	2.0	160	8.0	958	47.9	0	0.0	0	0.0
5	7/5	2	20	40	37	0.9	481	12.0	1,432	35.8	0	0.0	0	0.0
6	7/8	2	17	34	24	0.7	353	10.4	932	27.4	0	0.0	1	0.0
7	7/12	2	15	30	12	0.4	133	4.4	1,937	64.6	0	0.0	200	6.7
8	7/16	2	6	12	4	0.3	35	2.9	115	9.6	0	0.0	142	11.8
9	7/19	3	27	81	11	0.1	39	0.5	843	10.4	0	0.0	1,959	24.2
10	7/22	6	71	426	20	0.0	185	0.4	1,771	4.2	0	0.0	12,764	30.0
11	7/25	8	90	720	22	0.0	74	0.1	406	0.6	118	0.2	7,838	10.9
12	7/29	6	78	468	19	0.0	75	0.2	900	1.9	125	0.3	14,135	30.2
13	7/31	6	35	210	4	0.0	9	0.0	63	0.3	0	0.0	5,886	28.0
14	8/3	6	124	744	10	0.0	67	0.1	89	0.1	1	0.0	18,114	24.3
15	8/7	6	116	696	9	0.0	27	0.0	38	0.1	0	0.0	15,346	22.0
16	8/10	6	64	384	6	0.0	7	0.0	7	0.0	0	0.0	6,166	16.1
17	8/13	6	65	390	2	0.0	27	0.1	20	0.1	0	0.0	5,003	12.8
18	8/16	6	95	570	6	0.0	42	0.1	8	0.0	0	0.0	6,261	11.0
19	8/20	6	77	462	4	0.0	41	0.1	8	0.0	0	0.0	3,589	7.8
20	8/23	6	63	378	3	0.0	6	0.0	4	0.0	0	0.0	2,664	7.0
21	8/26	6	15	90	1	0.0	0	0.0	0	0.0	0	0.0	540	6.0
	Total	92.5	241	5,757	237	0.04	1,851	0.3	9,651	1.7	244	0.04	100,608	17.5

[a] Includes estimates of the number of chum salmon harvested for roe-only sales during periods 5 and 7.

Table 24. The 1996 commercial salmon catch statistics for statistical area 335-12.

Fishing				Permit	Chinook		Sockeye		Chum		Pink		Coho	
Period	Date	Hours	Permits	Hours	Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE
1	6/17	2	245	490	2,045	4.2	1,850	3.8	11,560	23.6	0	0.0	0	0.0
2	6/20	2	185	370	1,014	2.7	4,205	11.4	18,678	50.5	0	0.0	0	0.0
3	6/24	1.5	129	194	248	1.3	1,762	9.1	10,233	52.9	0	0.0	0	0.0
4	7/2	2	122	244	259	1.1	2,058	8.4	9,868	40.4	0	0.0	0	0.0
5	7/5	2	86	172	85	0.5	882	5.1	8,460	49.2	0	0.0	1	0.0
6	7/8	2	102	204	63	0.3	2,800	13.7	11,366	55.7	0	0.0	14	0.1
7	7/12	2	127	254	103	0.4	1,555	6.1	15,561	61.3	0	0.0	1,018	4.0
8	7/16	2	122	244	46	0.2	248	1.0	9,278	38.0	0	0.0	3,214	13.2
9	7/19	3	141	423	61	0.1	132	0.3	6,491	15.3	0	0.0	7,046	16.7
10	7/22	6	207	1,242	56	0.0	97	0.1	7,807	6.3	165	0.1	23,722	19.1
11	7/25	8	254	2,032	44	0.0	76	0.0	4,720	2.3	140	0.1	61,435	30.2
12	7/29	6	247	1,482	35	0.0	66	0.0	1,474	1.0	329	0.2	68,635	46.3
13	7/31	6	250	1,500	24	0.0	49	0.0	834	0.6	212	0.1	52,739	35.2
14	8/3	6	212	1,272	18	0.0	37	0.0	336	0.3	23	0.0	44,710	35.1
15	8/7	6	195	1,170	19	0.0	27	0.0	319	0.3	34	0.0	36,850	31.5
16	8/10	6	240	1,440	16	0.0	34	0.0	198	0.1	32	0.0	28,714	19.9
17	8/13	6	224	1,344	13	0.0	33	0.0	144	0.1	21	0.0	30,841	22.9
18	8/16	6	196	1,176	3	0.0	24	0.0	131	0.1	3	0.0	20,779	17.7
19	8/20	6	150	900	7	0.0	19	0.0	22	0.0	2	0.0	7,242	8.0
20	8/23	6	104	624	1	0.0	9	0.0	9	0.0	5	0.0	3,960	6.3
21	8/26	6	72	432	1	0.0	6	0.0	7	0.0	0	0.0	2,410	5.6
	Total	92.5	241	17,209	4,161	0.24	15,969	0.9	117,496	6.8	966		393,330	22.9

Table 25. The 1996 commercial salmon catch statistics for statistical area 335-13.

Fishing Period	Date	Hours	Permits	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Pink Catch	Pink CPUE	Coho Catch	Coho CPUE
1	6/17	0	Not Open to Commercial Fishing											
2	6/20	2	81	162	856	10.57	1,817	22.4	7,292	90.0	0	0.0	0	0.0
3	6/24	1.5	97	146	330	3.40	2,284	23.5	7,581	78.2	0	0.0	0	0.0
4	7/2	2	75	150	189	2.52	1,358	18.1	8,239	109.9	0	0.0	0	0.0
5	7/5	2	74	148	141	1.91	1,642	22.2	5,648	76.3	0	0.0	1	0.0
6	7/8	2	75	150	76	1.01	3,181	42.4	4,362	58.2	0	0.0	6	0.1
7	7/12	2	75	150	83	1.11	1,391	18.5	6,748	90.0	0	0.0	311	4.1
8	7/16	2	58	116	27	0.47	231	4.0	3,860	66.6	0	0.0	1,031	17.8
9	7/19	3	78	234	64	0.82	64	0.8	3,796	48.7	0	0.0	4,093	52.5
10	7/22	6	125	750	94	0.75	311	2.5	4,246	34.0	71	0.1	12,283	98.3
11	7/25	8	135	1,080	40	0.30	73	0.5	2,742	20.3	99	0.1	34,446	255.2
12	7/29	6	185	1,110	40	0.22	43	0.2	925	5.0	126	0.1	52,950	286.2
13	7/31	6	139	834	18	0.13	30	0.2	543	3.9	51	0.1	43,749	314.7
14	8/3	6	163	978	28	0.17	25	0.2	600	3.7	19	0.0	49,738	305.1
15	8/7	6	177	1,062	13	0.07	17	0.1	185	1.0	13	0.0	31,440	177.6
16	8/10	6	168	1,008	22	0.13	14	0.1	571	3.4	7	0.0	37,493	223.2
17	8/13	6	123	738	8	0.07	19	0.2	97	0.8	6	0.0	20,904	170.0
18	8/16	6	148	888	17	0.11	76	0.5	65	0.4	1	0.0	18,405	124.4
19	8/20	6	112	672	5	0.04	19	0.2	17	0.2	10	0.0	8,615	76.9
20	8/23	6	84	504	4	0.05	7	0.1	10	0.1	5	0.0	3,770	44.9
21	8/26	6	101	606	9	0.09	17	0.2	6	0.1	3	0.0	4,516	44.7
	Total	90.5	309	11,486	2,064	0.18	12,619	1.1	57,533	5.0	411	0.0	323,751	28.2

Table 26. The 1996 commercial salmon catch statistics for statistical area 335-14.

Fishing				Permit	Chinook		Sockeye		Chum		Pink		Coho	
Period	Date	Hours	Permits	Hours	Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE
1	6/17	0			Not Open to Commercial Fishing									
2	6/20	2	16	32	172	5.4	311	9.7	1,352	42.3	0	0.0	0	0.0
3	6/24	1.5	14	21	88	4.2	374	17.8	1,624	77.3	0	0.0	0	0.0
4	7/2	2	17	34	58	1.7	386	11.4	1,850	54.4	0	0.0	0	0.0
5	7/5	2	14	28	53	1.9	476	17.0	2,111	75.4	0	0.0	0	0.0
6	7/8	2	17	34	15	0.4	461	13.6	2,141	63.0	0	0.0	3	0.1
7	7/12	2	20	40	32	0.8	702	17.6	2,222	55.6	0	0.0	79	2.0
8	7/16	2	12	24	10	0.4	88	3.7	1,939	80.8	0	0.0	288	12.0
9	7/19	3	21	63	28	0.4	63	1.0	2,260	35.9	0	0.0	1,648	26.2
10	7/22	6	14	84	13	0.2	46	0.5	680	8.1	0	0.0	1,674	19.9
11	7/25	8	28	224	18	0.1	33	0.1	1,156	5.2	0	0.0	9,918	44.3
12	7/29	6	23	138	3	0.0	2	0.0	529	3.8	0	0.0	9,053	65.6
13	7/31	6	51	306	6	0.0	4	0.0	101	0.3	0	0.0	20,572	67.2
14	8/3	6	52	312	3	0.0	0	0.0	72	0.2	0	0.0	19,978	64.0
15	8/7	6	31	186	2	0.0	2	0.0	39	0.2	0	0.0	10,696	57.5
16	8/10	6	31	186	1	0.0	5	0.0	21	0.1	0	0.0	11,280	60.6
17	8/13	6	59	354	2	0.0	3	0.0	35	0.1	0	0.0	13,305	37.6
18	8/16	6	23	138	2	0.0	5	0.0	11	0.1	0	0.0	3,567	25.8
19	8/20	6	62	372	3	0.0	4	0.0	4	0.0	0	0.0	6,424	17.3
20	8/23	6	42	252	1	0.0	0	0.0	0	0.0	0	0.0	2,739	10.9
21	8/26	6	21	126	0	0.0	0	0.0	0	0.0	0	0.0	1,218	9.7
	Total	90.5	117	2,954	510	0.2	2,965	1.0	18,147	6.1	0	0.0	112,442	38.1

FIGURES

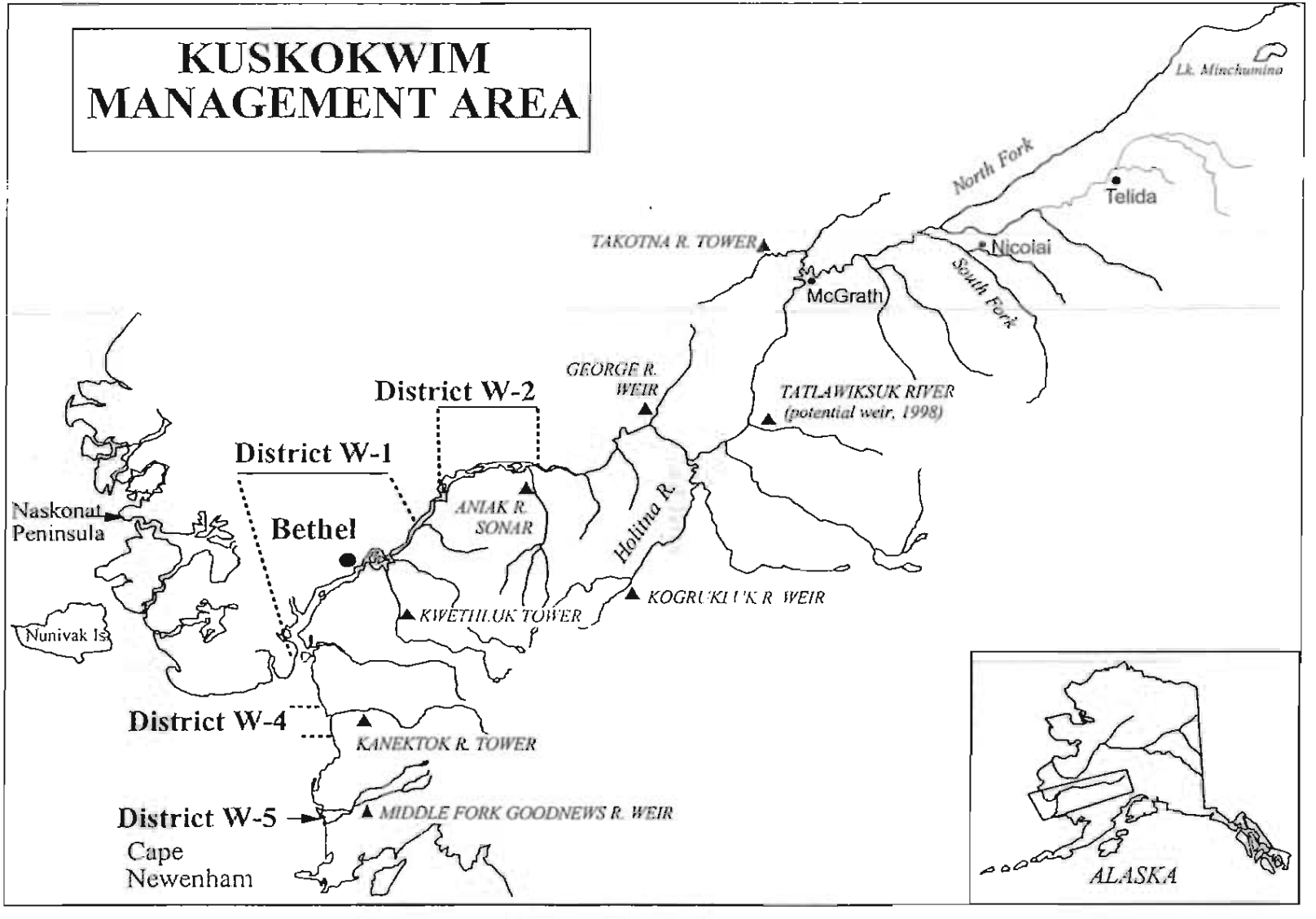
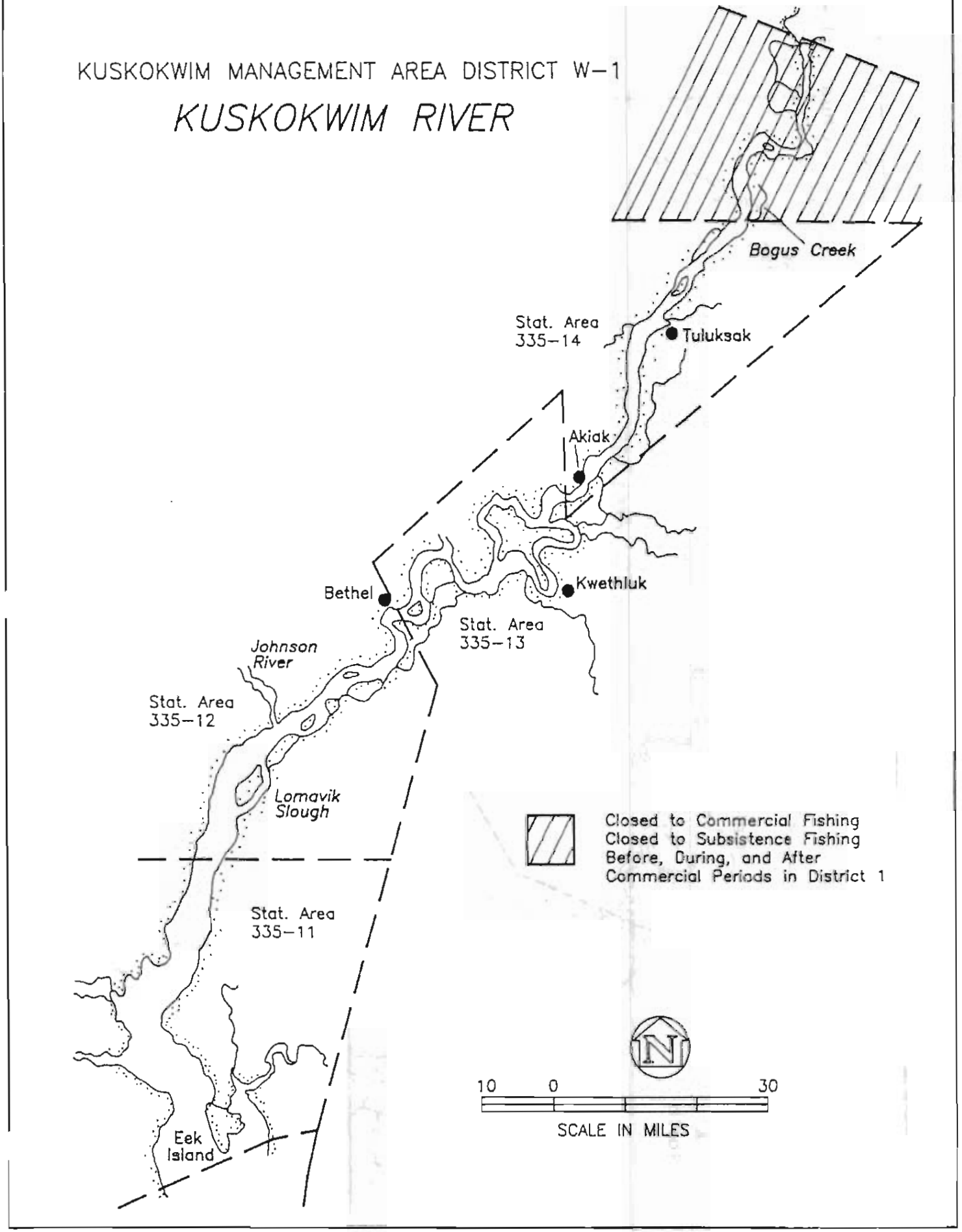


Figure 1. Kuskokwim Area map showing salmon management districts and escapement monitoring projects.


KUSKOKWIM MANAGEMENT AREA DISTRICT W-1
KUSKOKWIM RIVER
Bogus Creek
Stat. Area 335-14
Tuluksak
Akiak
Bethel
Kwethluk
Stat. Area 335-13
Johnson River
Stat. Area 335-12
Lomavik Slough
Stat. Area 335-11
Eek Island
Closed to Commercial Fishing
Closed to Subsistence Fishing
Before, During, and After
Commercial Periods in District 1
N
10 0 30
SCALE IN MILES

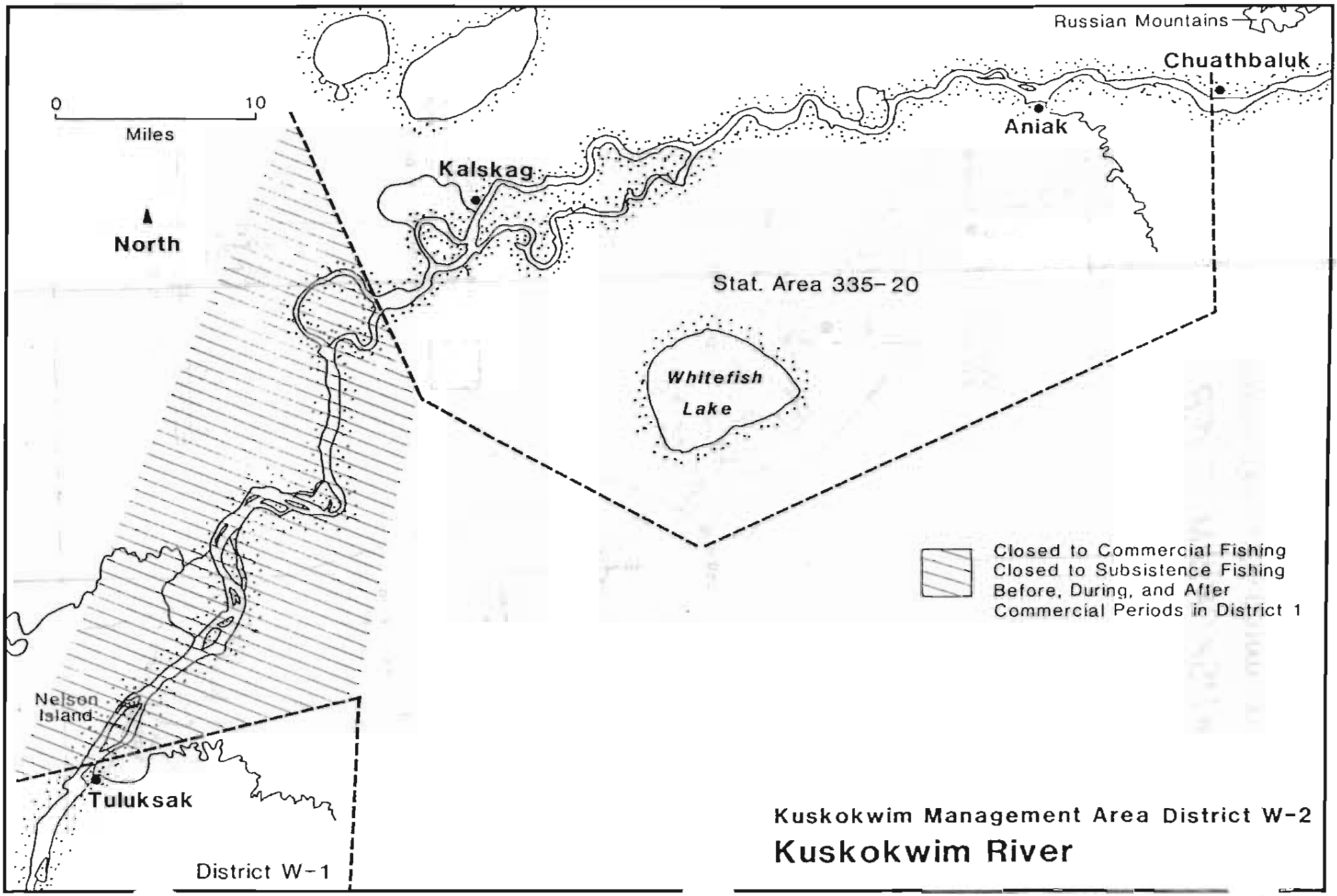


Figure 3. kokwim Management Area, District W-2

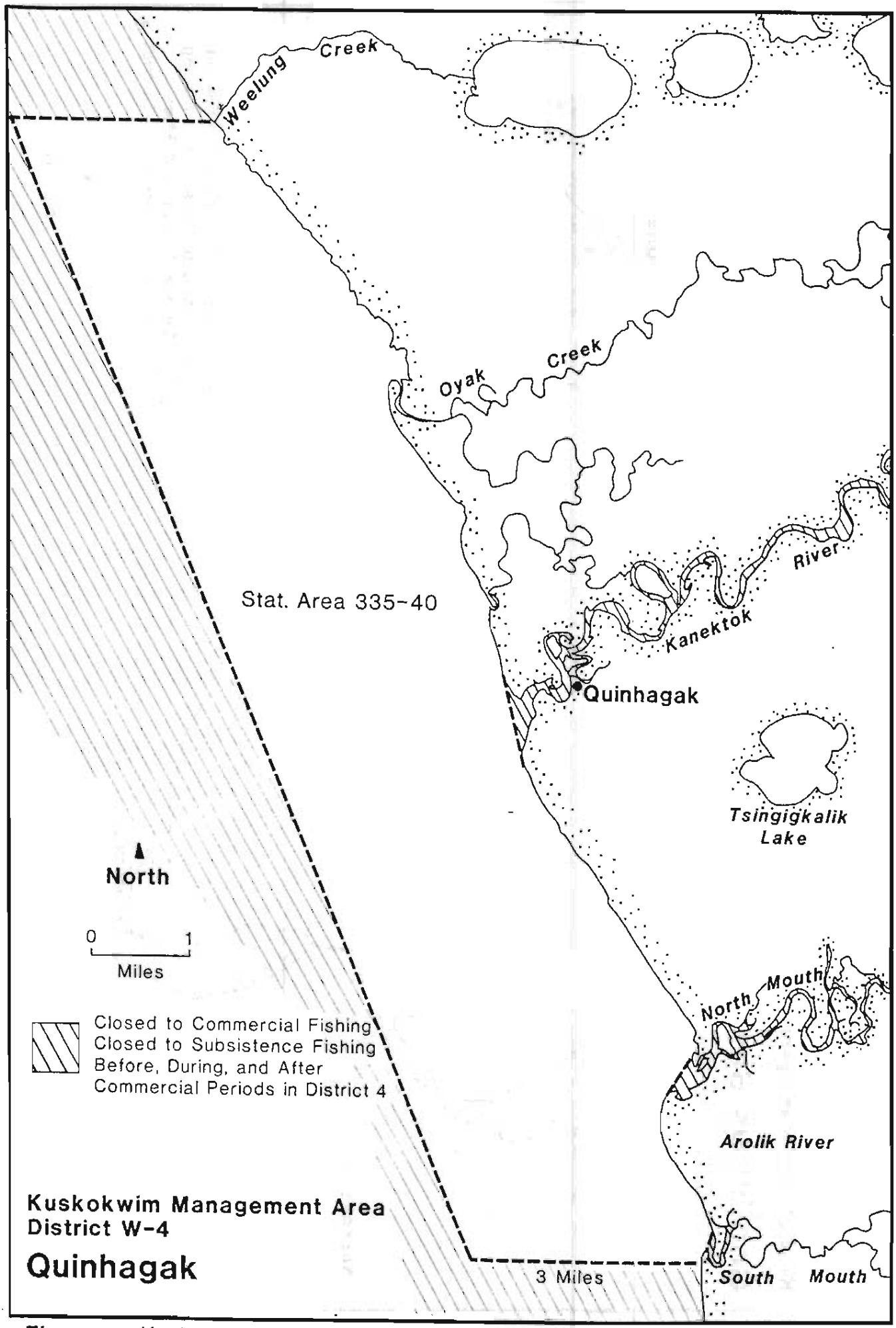


Figure 4. Kuskokwim Management Area, District W-4

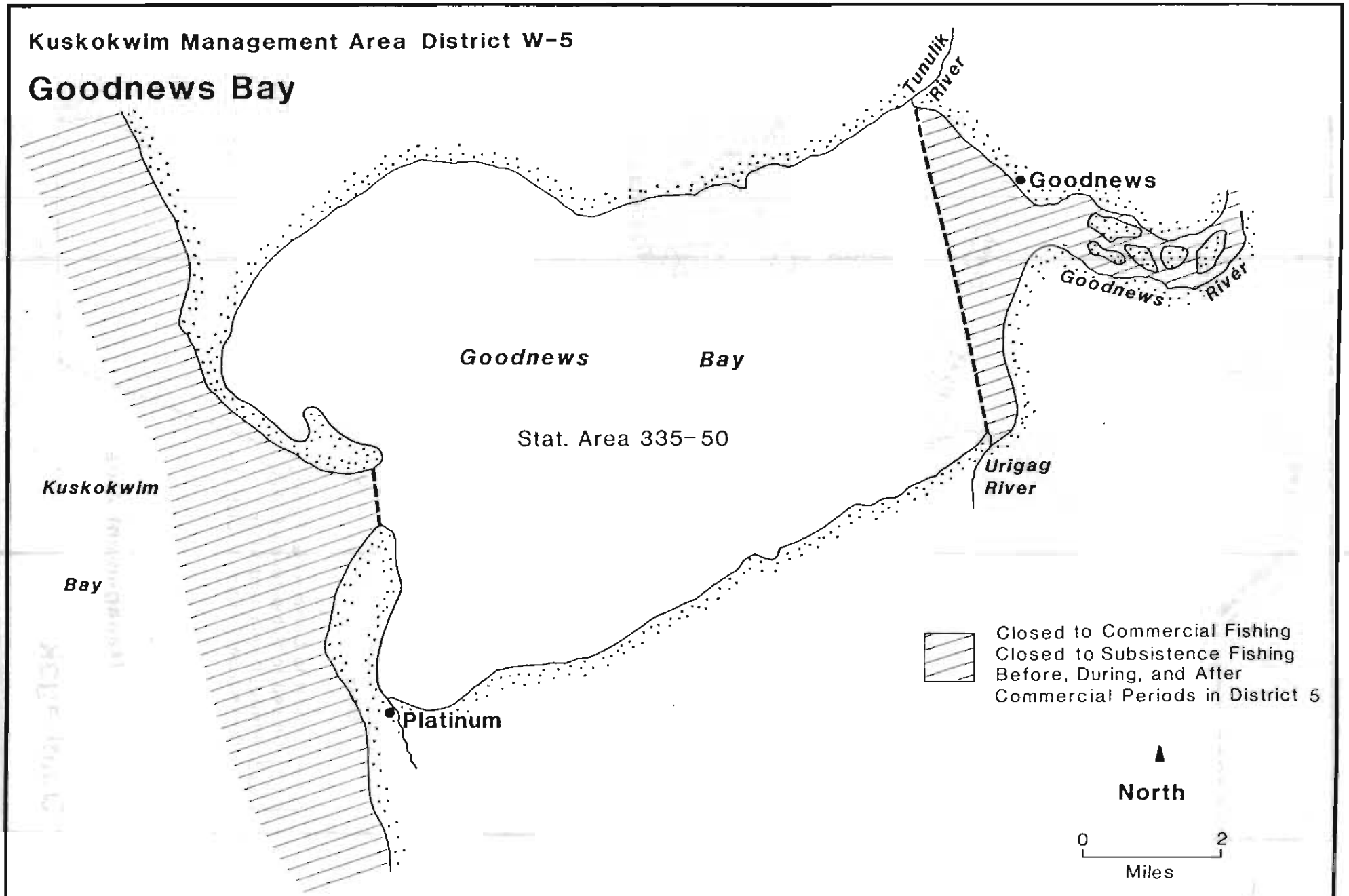


Figure 5 Kuskokwim Management Area, District W-5

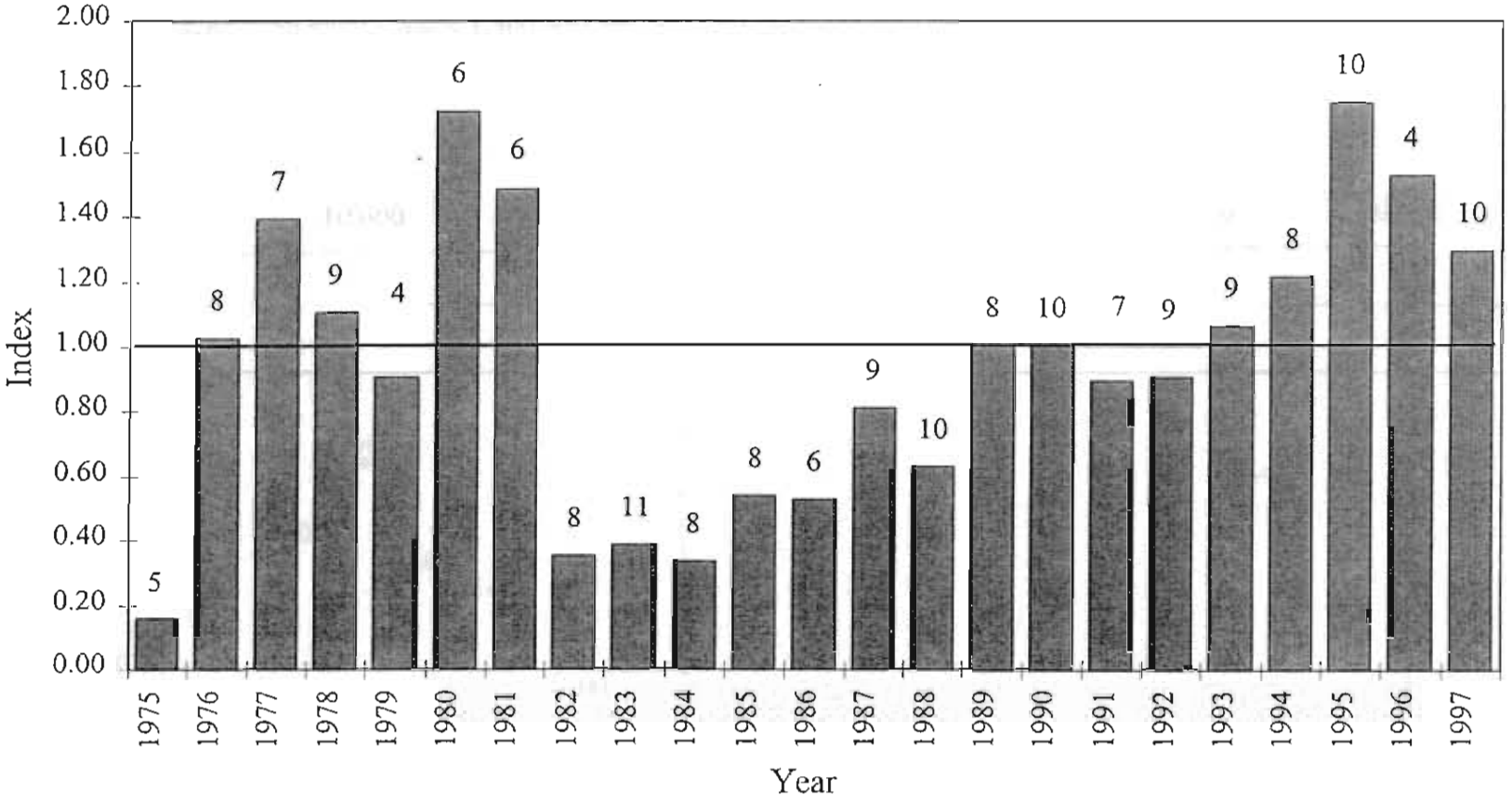


Figure 6. The Kuskokwim River chinook salmon escapement index represents the relative escapement of 13 possible index streams for which adequate data is available. Numbers on top of bars indicate the number of index streams represented. The index scale represents the escapement relative to the proportion of the BEG, if a BEG has been established, otherwise it represents the proportion of the median historical escapement. Index values greater than or equal to one mean that the BEG or historical median escapement was achieved in half or more of the streams. Index values less than one mean that that the BEG or historical median escapement was not achieved in over half the streams.

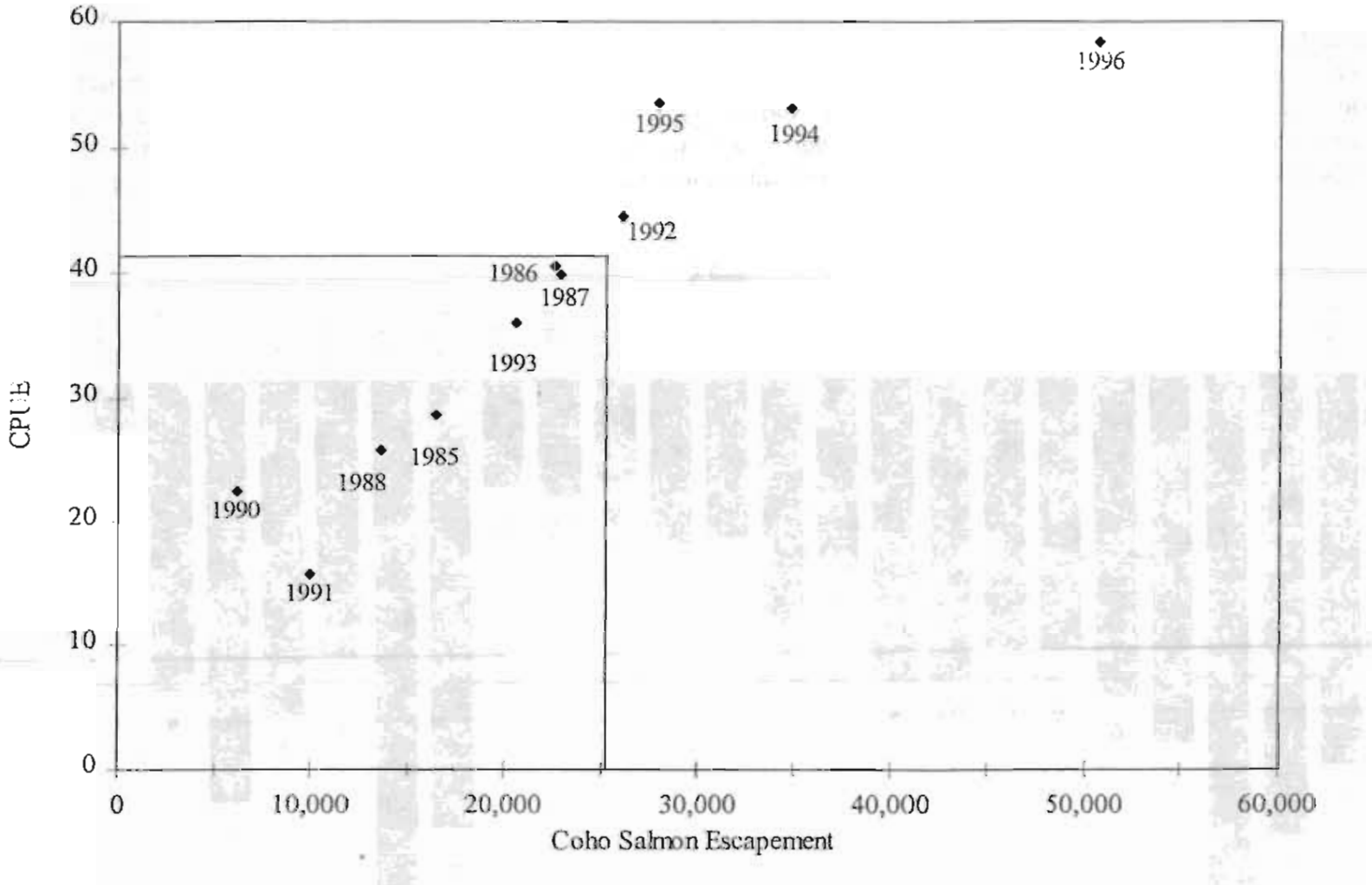


Figure 7. Relationship between annual coho salmon escapement at Kogrukluk River weir and the annual average commercial CPUE in District 2 between August 1 and August 21.

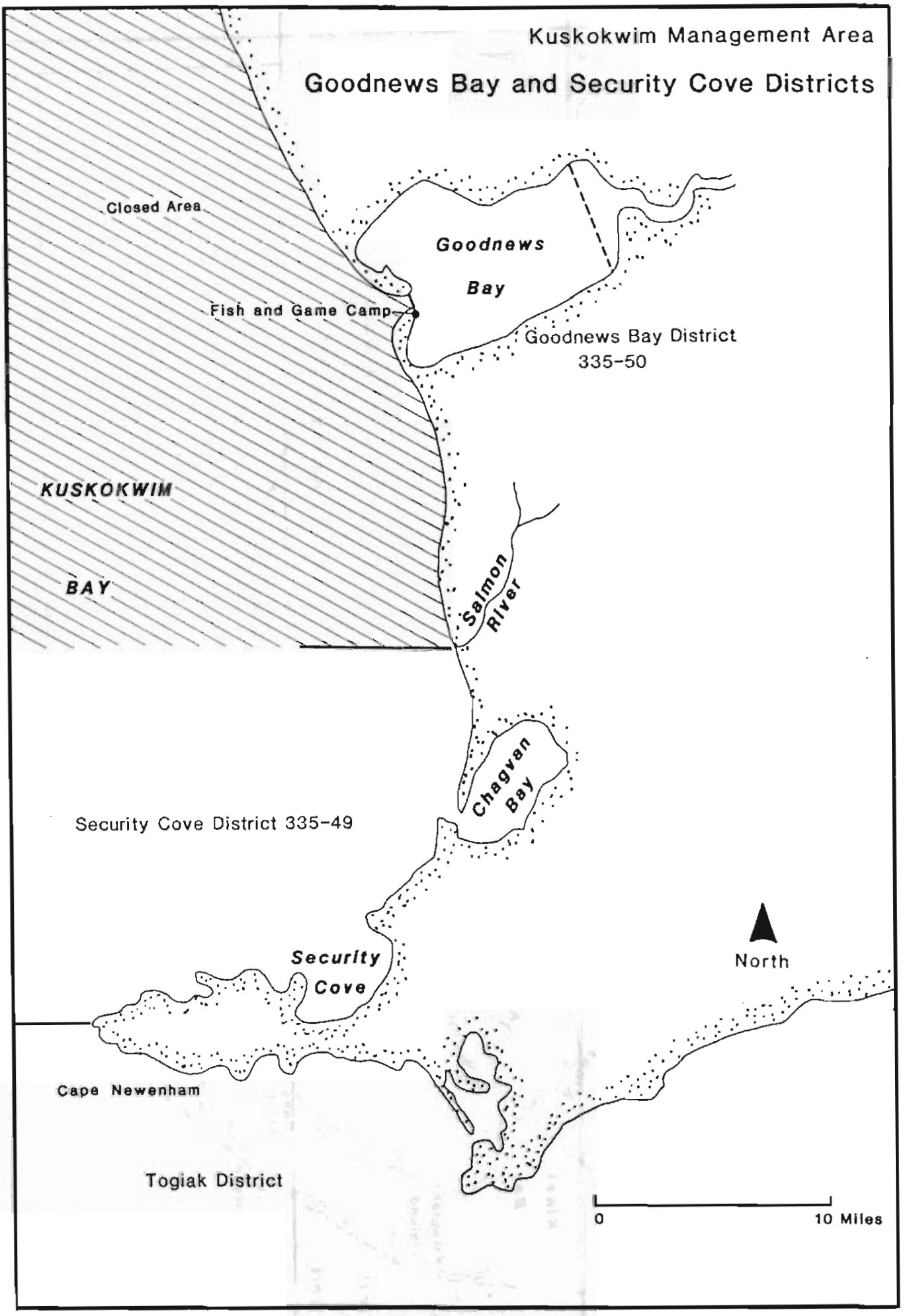


Figure 8. Goodnews Bay and Security Cove Herring Districts

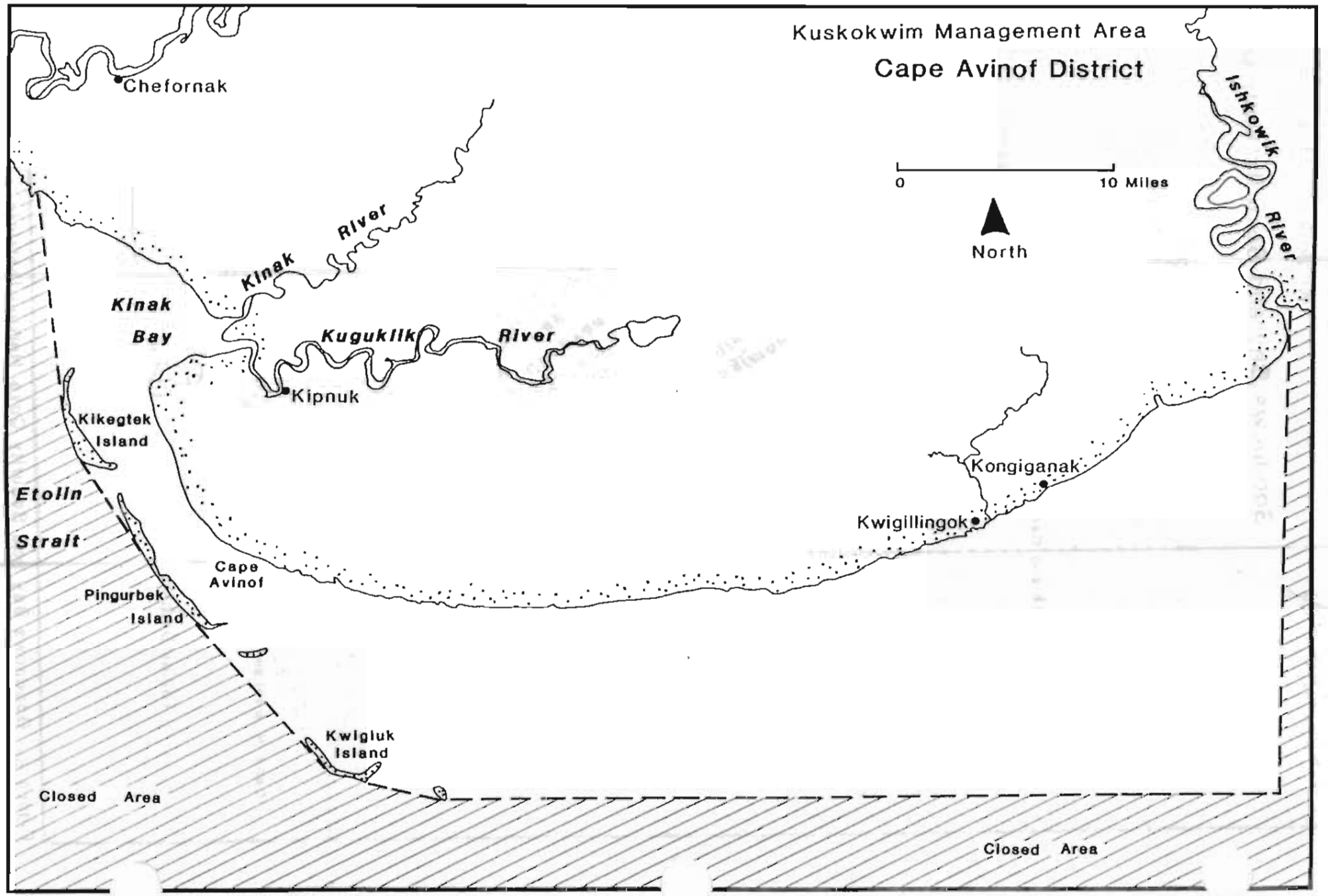


Figure 9. .pe Avinof Herring District

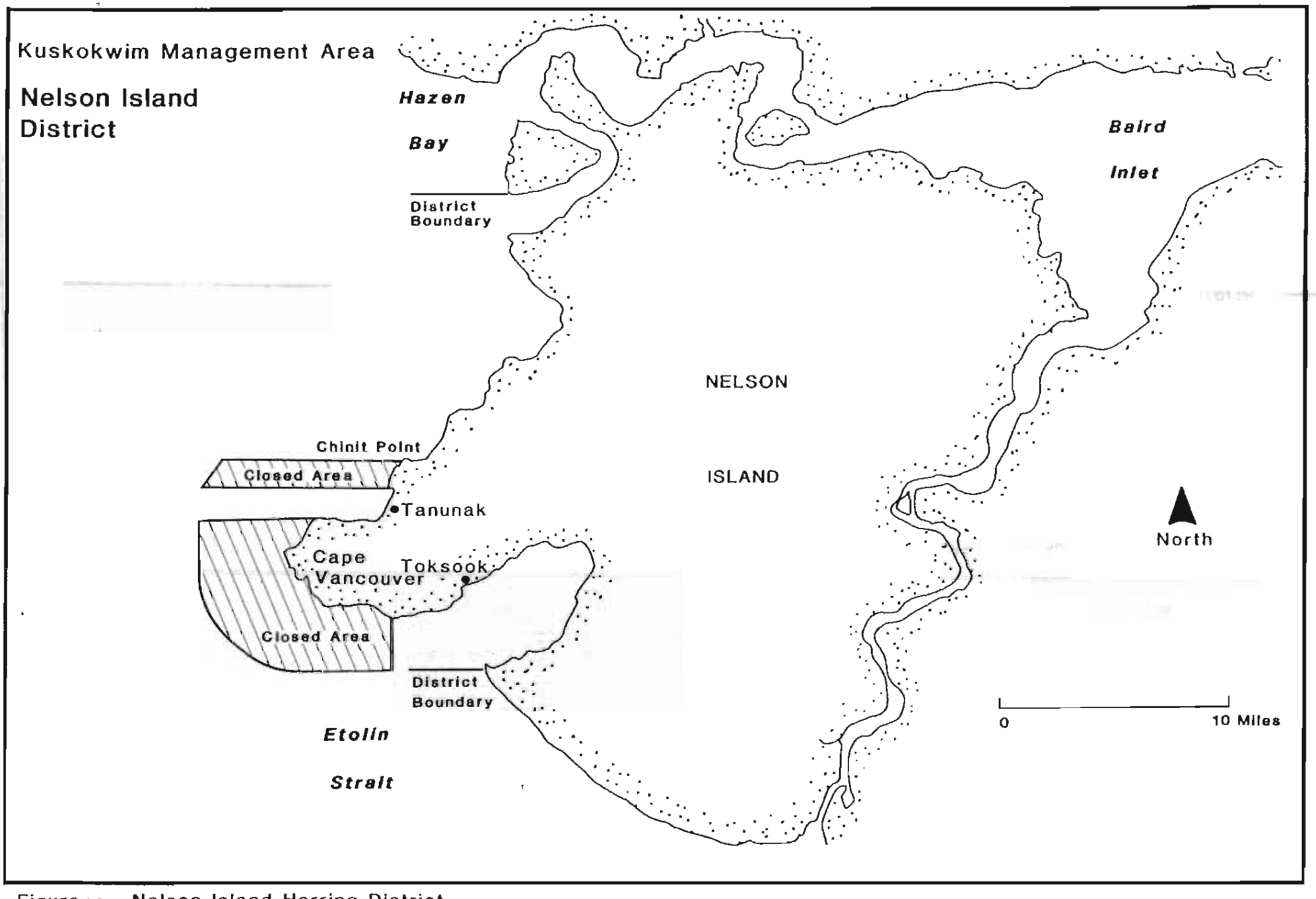


Figure 10. Nelson Island Herring District

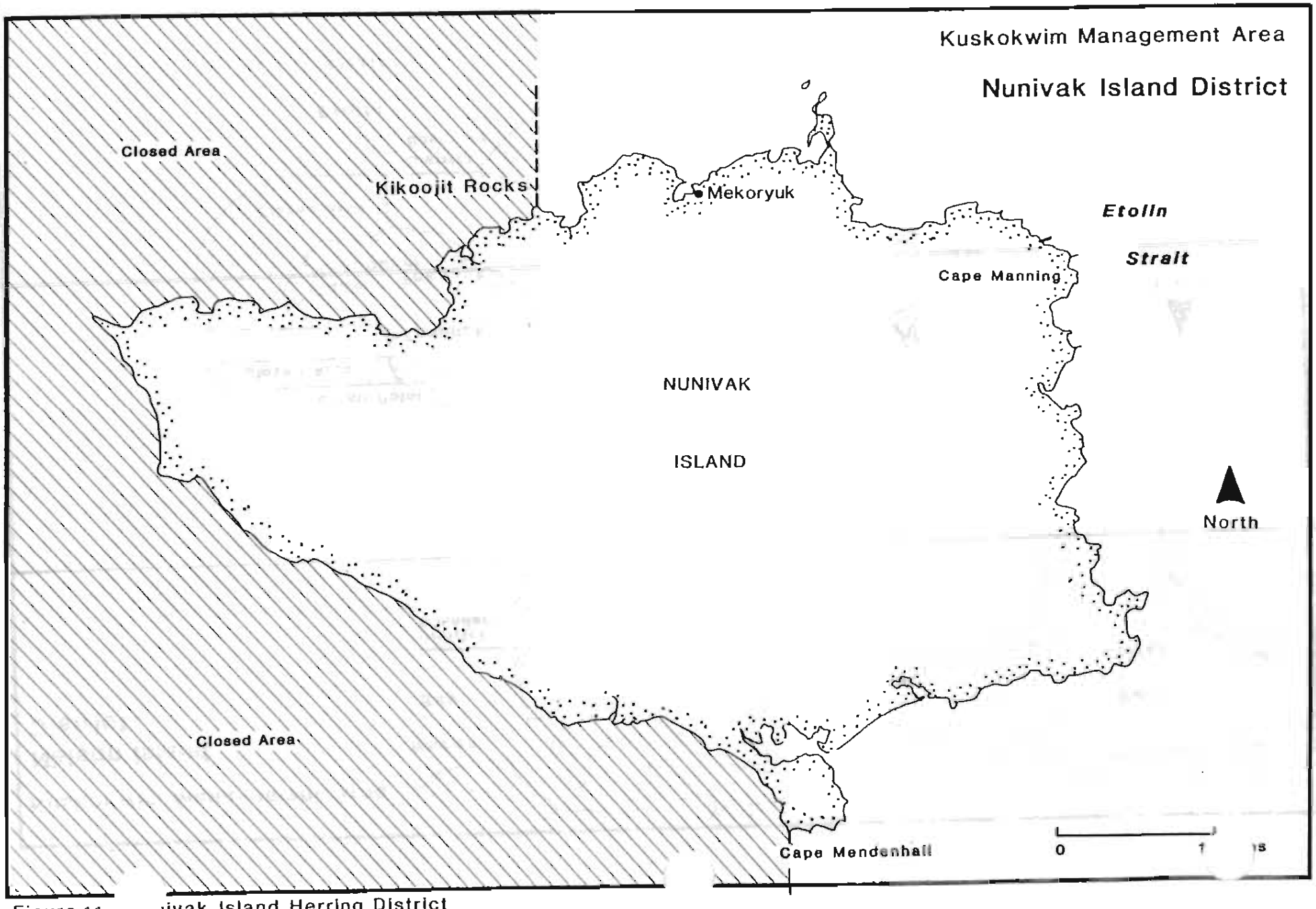


Figure 11. ...ivak Island Herring District

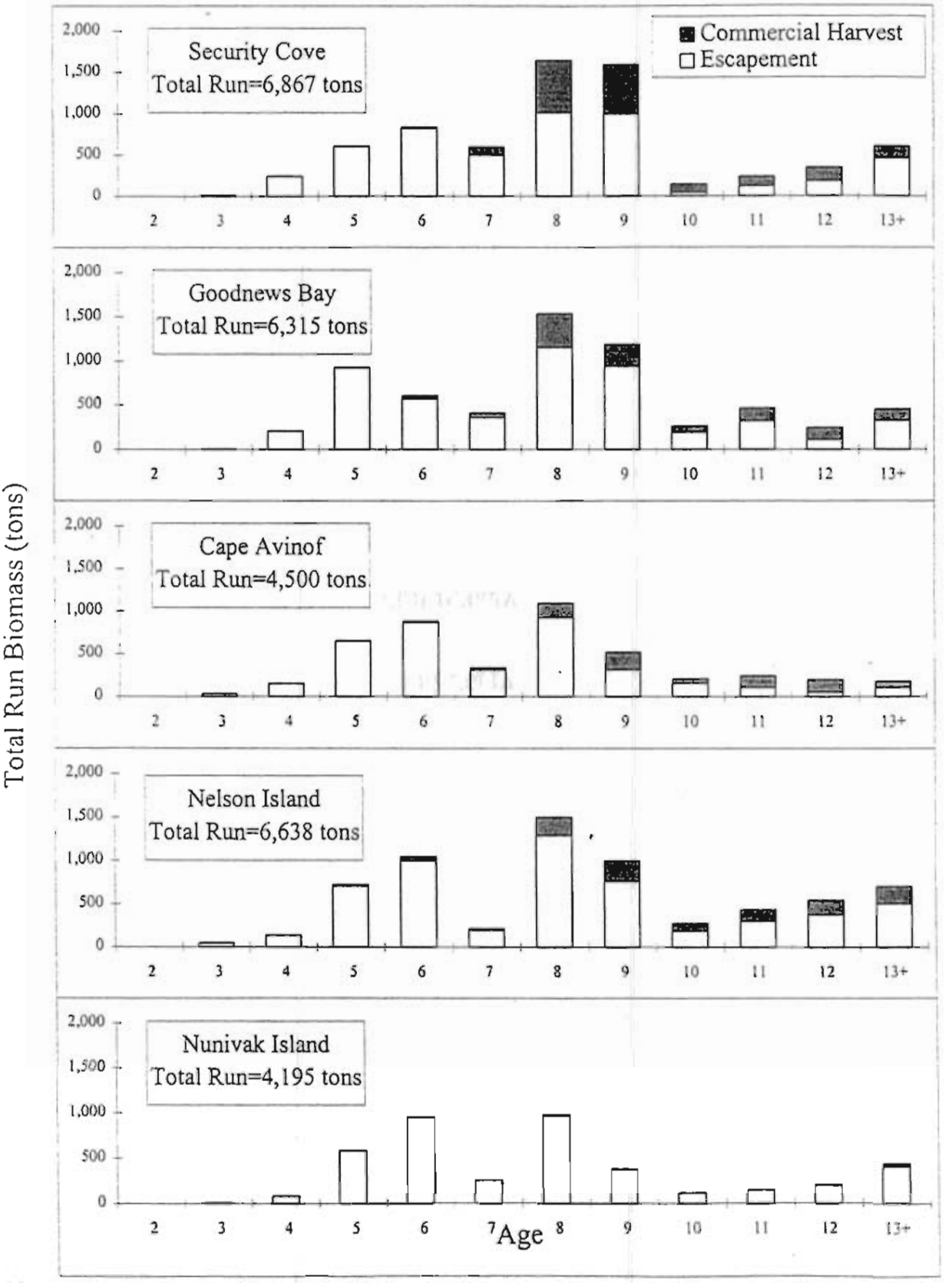


Figure 12. Age composition of Pacific herring for the escapement and harvest in the Kuskokwim Area, Alaska, 1996.

APPENDICES

APPENDIX A

Appendix A.1. Fish species commonly found in the Kuskokwim Area.

Species Code	Genus and Species[a]	Common Name[a]
110	Gadus macrocephalus	Pacific Cod
113	Eleginus gracilis	Saffron Cod
129	Platichthys stellatus	Starry Flounder
122	Pleuronectes glacialis	Arctic Flounder
127	Pleuronectes aspera	Yellowfin Sole
128	Pleuronectes vetulus	English Sole
162	Cottus cognatus	Slimy Sculpin
166	Oligocottus maculosus	Tidepool Sculpin
192	Hexagrammos stelleri	Whitespotted Greenling
200	Hippoglossus stenolepis	Pacific Halibut
230	Clupea pallasi	Pacific Herring
410	Oncorhynchus tshawytscha	Chinook Salmon
420	Onchornynchus nerka	Sockeye Salmon
430	Onchornynchus kisutch	Coho Salmon
440	Onchornynchus gorbuscha	Pink Salmon
450	Onchornynchus keta	Chum Salmon
500	Esox lucius	Northern Pike
513	Osmerus mordax	Rainbow Smelt
514	Hypomesus olidus	Pond Smelt
516	Mallotus villosus	Capelin
520	Salvelinus alpinus	Arctic Char
532	Salvelinus malma	Dolly Varden
541	Onchornynchus mykiss	Rainbow Trout
550	Salvelinus namaycush	Lake Trout
570	Stenodus leucichthys	Inconnu
588	Coregonus nasus	Broad Whitefish
589	Coregonus pidschian	Humpback Whitefish
583	Coregonus sardinella	Least Cisco
584	Coregonus autumnalis	Arctic Cisco
586	Prosopium cylindraceum	Round Whitefish
590	Lota lota	Burbot
600	Lampetra tridentata	Pacific Lamprey
601	Lampetra japonica	Arctic Lamprey
610	Thymallus arcticus	Arctic Grayling
630	Dallia pectoralis	Alaska Blackfish
640	Catostomus catostomus	Longnose Sucker
660	Gasterosteus aculeatus	Threespine Stickleback
661	Pungitius pungitius	Ninespine Stickleback
670	Percopsis omiscomaycus	Trout Perch
NA	Megalocottus platycephalus	Belligerent Sculpin
NA	Myoxocephalus quadricornis	Fourhorn Sculpin

a Based on American Fisheries Society Special Publication No. 20, Common and Scientific Names of Fishes from the United States and Canada (Fifth Edition). Committee and Names of Fishes, Bethesda, Maryland, 1991.

Appendix A.2. Historic events which have potential or actual influence on the commercial salmon fisheries of the Kuskokwim Area.

YEAR	EVENT [a]
1913	• Commercial sale of salmon export first documented in the Kuskokwim Area.
1954	• Commercial chinook salmon quota established.
1959	• First chinook landing since quota established.
1960	• Kanektok Counting Tower (1960-1962) • Quinhagak District (W-4) commercial salmon fishery established. • Kuskokwim Area divided into four subdistricts; Lower Kuskokwim River (Subdistrict 1), Middle Kuskokwim River (Subdistrict 2), Upper Kuskokwim River (Subdistrict 3), Quinhagak (Subdistrict 4). District boundaries are not well recorded; in the Aniak area some commonly used drift sites overlap between District 2 and 3 which confused catch reporting. • Kuskokwim River Drainage Surveys, 1960.
1961	• ADF&G Kuskokwim River tagging study.
1962	• ADF&G Kuskokwim River tagging study. • Boundary between Subdistricts 2 and 3 changed; the new location was not recorded but the most likely location was Kolmakoff River. The reason for the change was to move the boundary to a point which was between commonly used gillnet locations and thereby avoid confusion in catch reporting. As a result, there were no landings in Subdistrict 3.
1963	• ADF&G Kuskokwim River tagging study. • Boundaries of subdistrict documented; Subdistrict 1 extended from Kuskokuak to Mishevik Slough, Subdistrict 2 was from Mishevik Slough to Kolmakoff River, Subdistrict 3 was upstream of Kolmakoff River.
1965	• Kwegooyuk test fishery (1965-1984; no records available for 1965).
1966	• ADF&G Kuskokwim River tagging study. • Subdistrict 3 was deleted from the regulations due to a lack of landings.
1968	• Goodnews Bay District (W-5) commercial salmon fishery established.
1969	• District 4 tagging study (1969-1970) on chinook and chum salmon. • Kogrukluk River (aka. Holitna River, Ignatti) tower/weir (1969-present).
1970	• Effect of explosive detonation in ice on northern pike.
1971	• Commercial fishing time in the Kuskokwim River reduced from two 24 hour periods per week to two 12 hour period per week. • Chum fishery begins in the Kuskokwim River; season was from 25 June to 31 July, location limited to waters downstream of Napakiak, mesh size restricted to 6 in. or smaller. • Fishing periods established by Emergency Order in August. • Gillnet mesh size in Districts 4 and 5 restricted to 6 inch or smaller.
1974	• Commercial sale of salmon roe from subsistence caught fish (1974-1977)
1976	• Commercial fishing time in the Kuskokwim River was reduced from two 12 hour periods per week to two 6 hour periods per week. • Eek River reconnaissance survey. • Study on genetic variants in chum and chinook salmon.
1977	• Fishing periods to be established by Emergency Order before 26 June and after 31 July. • Limited entry permits issued. • Subsistence fishing closed 24 hours before during and 6 hours after each commercial fishing period. • Hoholitna River reconnaissance survey

-continued-

YEAR	EVENT[a]
1978	• Kasigluk River reconnaissance survey. • Kwethluk River sonar project.
1979	• The portion of District 1 used during the chum salmon season was extended from Napakiak upstream to Bethel. • Kasigluk River sonar project. • High seas salmon fleet moved to 20° west.
1980	• Subsistence fishing closed 24 hours before, during and 6 hours after each commercial fishing period. • Aniak River sonar project.
1981	• Pilot test fish and FanScan projects at Bethel. • Inventory of Kisaralik River and Lake. • Goodnews River counting tower (1981-1990). • Salmon River (Pitka Fork drainage) weir project (1981-1984). • Species identification program results in better differentiation of sockeye and chum salmon.
1982	• Kanektok River sonar project (1982-1986).
1983	• Pilot test fish project at Bethel using drift gillnets. • Provisional escapement goals established for many of the major spawning tributaries in the area. • Management strategy shifts from guideline harvest based to obtaining escapement objective.
1984	• Kwegooyuk test fishery replaced by the Bethel drift test fishery.
1985	• Commercial fishing restricted to mesh sizes less than or equal to 6 inches. • Chum season utilizes entire length of District 1.
1986	• *Migratory timing of coho salmon in the Kuskokwim Area, 1979-1984.* • Kuskokwim River salmon abundance estimate based on calibrated test fish CPUE. • Downstream boundary of District 1 extended to a line from Apokak Slough to Popokamiut.
1987	• Discontinued the directed chinook salmon fishery in the Kuskokwim River. • First fishing period restricted to that portion of District 1 which is downstream of Bethel due to chinook conservation concerns. • Subsistence fishing in all of District 2 and its tributary streams is closed before, during and after commercial periods. • South peninsula sockeye and chum salmon tagging study.
1988	• Review of the estimation of Kuskokwim River annual salmon passage through expansion of the Bethel test fish CPUE. • Kuskokwim River sonar project (1988-1995). • Kuskokwim River subsistence test fisheries (1988-1990). • District 1 upstream boundary extended to Bogus Creek. • District 2 reduced in size; downstream boundary moved upstream to High Bluffs, the upstream boundary moved downstream to Chuathbaluk. • Portion of Kuskokwim River between Districts 1 and 2 closed to subsistence fishing when District 1 subsistence fishing is closed. • Reorganization of District 1 Statistical Areas. • District 4 Salmon Management Plan adopted. • Establishment of the Kuskokwim River Salmon Management Working Group (1988-present). • Eek Test Fishery (1988-1990, 1992 to present).

-continued-

YEAR	EVENT[a]
1989	• USFWS conducted genetic sampling throughout the Kuskokwim Area. • USFWS conducted chinook tagging study in the lower Kuskokwim River. • Record low temperatures recorded in interior Alaska coupled with shallow snow pack threaten survival of salmon eggs/fry from 1988 spawning.
1990	• ADF&G genetic sampling (1990 - present). • Reorganization of District 1 statistical areas. • Upstream boundary of District 1 moved downstream from Bogus Creek to Big Island. • Downstream boundary of District 2 moved upstream to second slough below Kalskag. • District 4 northern boundary is extended north to Weelung Creek.
1991	• USFWS begins operation of weir on Tuluksak River (1991-1994). • Weir replaces counting tower on Goodnews River (1991-present).
1992	• Initiation of the Aniak and Chuathbaluk test fisheries. • Eek test fishery is re-established for the coho season. • USFWS operates Kwethluk River weir (1992) • Ban on high-seas drift gillnet fishing imposed. • Unusual proportion of returning 5 year old chum salmon had a compressed annulus between the second the third winter checks. • Failure of age 4 chum salmon in the Kuskokwim River; Aniak drainage especially hard hit; attributed to cold winter of 1988-89.
1993	• Failure of age 4 and 5 chum salmon in the Kuskokwim River, Yukon River, and the Norton Sound/Kotzebue Area; cause unknown; especially hard hit were the Aniak drainage and the Yukon fall chum; commercial fishing severely restricted, chum sport fishery was closed, and the subsistence salmon fishery was restricted and closed for a period of time (first time ever).
1994	• Working Group commissioned and Dr. Mundy started "Recommendations for Strengthing the Cooperative Management Process of the Kuskokwim River Salmon Management Working Group".
1995	• Bering Sea Fishermen's Association operates a chum salmon radio telemetry project on the Kuskokwim River. • Takotna Community School operates a salmon counting tower on the Takotna River (1995-present). • AVCP and BSFA operate the Lower Kuskokwim test fishery in cooperation with the department; the project is a modification of the Eek test fishery.
1996	• ADF&G genetic sampling for late spawing chum salmon and one mixed stock sample from District W1. • Near record low water levels on the Kuskokwim River during June and early August coupled with record high water temperatres. • Irregular fishing schdule in District W1 during June and July due to limited market interest for chum salmon. • Record early coho run coupled with record high harvest and escapement at Kogrukluk River. • AVCP operates a salmon counting tower on the Kwethluk River. • KNA operates a salmon weir on the George River. • Aniak River sonar is relocated to allow for full channel ensoniffication and configurable sonar tecnology is employed. • Quinhagak IRA begins development of a salmon counting tower on the Kanektok River.

[a] For additional information on specific topics refer to the Region III Report Catalog or historical Area Management Reports for the Kuskokwim Area.

Appendix A.3 Kuskokwim Area escapement index objectives for chinook, sockeye, coho and chum salmon.

		Escapement Objectives[a]			
		Chinook	Sockeye	Coho	Chum
	KUSKOKWIM RIVER:				
1.	Kwethluk River				
	a. 3-step Mt. to Canyon Cr.	1.0	-	-	7.0
	b. Canyon Creek	0.2	-	-	-
2.	Kisaralik River				
	a. Airstrip to Kisaralik L.	1.0	-	-	8.0
	b. Kasigluk R. (upper to lower)	0.1	-	-	4.0
3.	Tuluksak R. (Fog R. to Bear Cr.)	0.4	-	-	5.0
4.	Aniak River				
	a. Buckstock R. to Aniak L.	1.5	-	-	10.0
	b. Salmon River	0.6	-	-	3.0
	c. Aniak Sonar Project[b]	-	-	-	250.0
5.	Holitna River				
	a. Nogamut to Kashegelok	2.0	-	-	12.0
	b. Kogrukluk Weir[c]	10.0	-	25.0	30.0
6.	Salmon River (Pitka Fork)	1.3	-	-	-
	KUSKOKWIM BAY:				
1.	Kanektok River to Kagati Lake	5.8	15.0	25.0	30.5
2.	Goodnews River System				
	a. Main Fork and lakes	1.6	15.0	15.0	17.0
	b. Middle Fork and lakes	0.8	5.0	2.0	4.0
	c. Middle Fork Weir[c]	3.5	25.0	-	15.0

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

b Sonar total escapement estimates.

c Weir total escapement estimates.

Appendix A.4. Kuskokwim Area commercial, subsistence and personal use salmon catches, 1913-1996.

	Commercial Harvest						Subsistence Harvest				Total
Year	Chinook	Sockeye	Chum	Pink	Coho	Subtotal	Chinook	Other[c]	Coho[b]	Subtotal	Harvest
1913	7,800					7,800					7,800
1914		2,667				2,667					2,667
1915											0
1916	949					949					949
1917	7,878					7,878					7,878
1918	3,055					3,055					3,055
1919	4,836					4,836					4,836
1920	34,853					34,853					34,853
1921	9,854					9,854					9,854
1922	8,944	6,120				15,064				180,000	195,064
1923	7,254					7,254					7,254
1924	19,253	900		7,167	7,167	34,487	17,700	203,148		220,848	255,335
1925	1,644	5,800				7,444	10,800	230,850		241,650	249,094
1926										738,576	738,576
1927										286,254	286,254
1928										481,090	481,090
1929										560,196	560,196
1930	7,626	2,448				10,074				538,650	548,724
1931	8,541					8,541				389,367	397,908
1932	9,339					9,339				746,415	755,754
1933							6,290	443,998		450,288	450,288
1934							20,800	597,132		617,932	617,932
1935	6,448				8,296	14,744	22,930	554,040		576,970	591,714
1936	624					624	33,500	549,423		582,923	583,547
1937	480					480		537,111		537,111	537,591
1938	624				828	1,452	10,153	400,242		410,395	411,847
1939	134					134	14,000	125,425		139,425	139,559
1940	247				500	747	8,000	415,523		423,523	424,270
1941	187				674	861	8,000	415,523		423,523	424,384
1942							6,400	325,339		331,739	331,739

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Year	Commercial Harvest						Subsistence Harvest				Total
	Chinook	Sockeye	Chum	Pink	Coho	Subtotal	Chinook	Other[a]	Coho[b]	Subtotal	Harvest
1943							6,400	325,339		331,739	331,739
1944											
1945											0
1946	2,288				674	2,962					2,962
1947	5,356					5,356					5,356
1948											0
1949											0
1950											0
1951	4,210					4,210					4,210
1952											0
1953											0
1954	57					57					57
1955											0
1956											0
1957											0
1958											0
1959	3,760					3,760					3,760
1960	5,969	5,649	0	0	5,498	17,116	18,887	301,753		320,640	337,756
1961	23,246	2,308	18,864	90	5,090	49,598	28,934	179,529		208,463	258,061
1962	20,867	10,313	45,707	4,340	12,432	93,659	13,582	175,304	161,849	350,735	444,394
1963	18,571	0	0	0	15,660	34,231	34,482	170,829	137,649	342,960	377,191
1964	21,230	13,422	707	939	28,992	65,290	29,017	219,208	190,191	438,416	503,706
1965	24,965	1,886	4,242	0	12,191	43,284	24,697	250,878		275,575	318,859
1966	25,823	1,030	2,610	268	22,985	52,716	49,325	175,735		225,060	277,776
1967	29,986	652	8,235	0	58,239	97,112	61,262	214,468		275,730	372,842
1968	43,157	5,884	19,684	75,818	154,275	298,818	35,698	278,008		313,706	612,524
1969	64,777	10,362	50,377	1,251	110,473	237,240	40,617	204,105		244,722	481,962
1970	64,722	12,654	60,566	27,422	62,245	227,609	69,612	246,810	11,868	328,290	555,899
1971	44,936	6,054	99,423	13	10,006	160,432	43,013	116,391	6,899	166,303	326,735
1972	55,598	4,312	97,197	1,952	23,880	182,939	38,176	120,316	1,325	159,817	342,756
1973	51,374	5,224	184,207	634	152,408	393,847	38,451	179,259	23,746	241,456	635,303
1974	30,670	29,003	196,127	60,099	179,579	495,478	26,665	277,170	32,780	336,615	832,093

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	Commercial Harvest						Subsistence Harvest						Total
Year	Chinook	Sockeye	Chum	Pink	Coho	Subtotal	Chinook		Other[c]		Coho[b]	Subtotal	Harvest
1975	28,219	17,686	225,308	910	112,751	384,874	47,569		176,389			223,958	608,832
1976	49,262	14,636	231,877	39,998	112,130	447,903	58,055		223,792		4,312	286,159	734,062
1977	58,256	18,621	298,959	434	263,727	639,997	58,158		203,397		12,193	273,748	913,745
1978	63,194	13,734	282,044	61,968	247,271	668,211	38,145		125,052		12,437	175,634	843,845
1979	53,314	39,463	297,167	574	308,683	699,201	57,053		163,451			220,504	919,705
1980	48,599	42,213	561,483	30,306	327,908	1,010,509	62,047		168,987		47,335	278,369	1,288,878
1981	79,377	105,940	485,653	463	278,541	949,974	64,274		163,554		28,301	256,129	1,206,103
1982	79,816	97,716	326,481	18,259	567,452	1,089,724	61,141		195,691		45,181	302,013	1,391,737
1983	93,676	90,834	306,554	379	248,389	739,832	51,020		149,172		2,834	203,026	942,858
1984	74,016	81,304	488,480	23,902	826,774	1,494,476	60,668		144,651		15,016	220,335	1,714,811
							Chinook	Sockeye	Chum	Pink	Coho		
1985	74,083	121,221	224,680	111	382,096	802,191	45,720	33,632	95,999	1,062	24,524	200,937	1,003,128
1986	44,972	142,029	349,268	16,569	736,910	1,289,748	54,256	20,239	142,930 [c]		29,742	247,167	1,536,915
1987	65,558	170,849	603,274	163	478,594	1,318,438	71,804	25,180	70,709	291	18,085	186,069	1,504,507
1988[de]	74,563	149,949	1,443,953	37,592	623,733	2,329,790	75,107	33,102	153,980		43,866	306,055	2,635,845
1989[d]	66,914	82,365	801,355	819	554,411	1,505,864	86,245	37,210	145,764		58,455	327,674	1,833,538
1990	84,451	203,919	521,023	16,050	443,783	1,269,226	92,127	39,434	130,550		50,528	312,639	1,581,865
1991	48,170	202,441	502,187	522	556,818	1,310,138	90,294	56,402	96,196		56,477	299,369	1,609,507
1992	67,597	192,341	436,506	85,978	772,449	1,554,871	68,567	33,884	99,089		44,330	245,870	1,800,741
1993	26,636	167,235	94,937	71	686,570	975,449	91,506	51,210	61,589		35,168	239,473	1,214,922
1994	27,345	191,169	360,893	84,870	856,100	1,520,377	98,585	39,378	77,213		36,630	251,806	1,772,183
1995	72,352	198,045	707,212	318	555,539	1,533,466	101,026	28,737	69,368		39,553	238,684	1,772,150
1996	22,959	122,260	301,975	1,663	1,099,865	1,548,722	82,353	35,198	90,761		35,154	243,466	1,792,188
10-Year Average 1986-95	57,856	170,034	582,061	48,212 [f]	626,491	1,460,737	8-Year Average 1988-95 87,312	39,395	102,723		44,462	273,893	1,779,215

[a] Primarily chum and coho salmon.

[b] Reported subsistence coho salmon harvest only. Coho salmon subsistence harvest is poorly documented with no Kuskokwim River estimates attempted prior to 1988.

[c] Includes sockeye, pink and chum salmon.

[d] The personal use catch is included with the subsistence catch.

[e] Beginning in 1988, estimates are based on a new formula therefore data since 1988 is not comparable with previous years.

[f] Even years only.

Appendix A.5. Estimated exvessel dollar value of the Kuskokwim Area commercial salmon fishery, 1964-1996.

Year	Gross Value ($) of Catch to Fishermen	Permits Fished[a]	Average Income
1964	83,030		
1965	90,950		
1966	87,466		
1967	138,647		
1968	290,370		
1969	297,233		
1970	362,470		
1971	371,220		
1972	360,727		
1973	827,735		
1974	1,056,042		
1975	899,178		
1976	1,380,229		
1977	3,891,950		
1978	2,337,470		
1979	3,329,155		
1980	2,725,134		
1981	3,613,309		
1982	4,213,954		
1983	2,670,400		
1984	5,809,000	774	7,505
1985	3,248,089	781	4,159
1986	4,746,089	789	6,015
1987	6,392,822	798	8,011
1988	12,514,492	811	15,431
1989	5,194,025	824	6,303
1990	4,865,070	824	5,904
1991	3,961,423	820	4,831
1992	5,295,912	814	6,506
1993	3,962,890	807	4,911
1994	5,201,611	797	6,526
1995	4,209,752	829	5,078
1996	2,900,613	713	4,068
Ten year Average (1986-1995)	5,634,409	811	6,952

a Number of permits that made at least one delivery

Appendix A.6. Commercial fishing effort in the Kuskokwim Area by permit-hour[a], 1960-1996.

	District 1	District 2	District 3	District 4	District 5	Total
1960	5,136	960	648	4,368	Closed	11,112
1961	16,200	1,512	1,512	4,992	Closed	24,216
1962	14,274		0	8,434	Closed	22,708
1963	5,712	1,722	0	5,520	Closed	12,954
1964	6,468	1,140	0		Closed	7,608
1965	13,500	546	0	3,696	Closed	17,742
1966	18,270		Closed		Closed	18,270
1967	88,248	1,932		3,954	Closed	94,134
1968	77,466	720		7,986	4,704	90,876
1969	67,140	1,488		29,952	14,055	112,635
1970	56,646	3,414		22,080	9,756	91,896
1971	18,060	1,842				19,902
1972	47,802					47,802
1973	77,478	3,072		18,372	2,928	101,850
1974	124,569	4,950		18,984	8,148	156,651
1975	181,786	3,648		12,312	5,400	203,146
1976	82,788	3,894		14,784	4,848	106,314
1977	73,944	3,426		17,592	3,780	98,742
1978	71,856	1,892		14,952	3,672	92,372
1979	49,608	984		27,096	8,220	85,908
1980	33,370	714		21,636	9,504	65,224
1981	45,096	1,248		25,656	11,256	83,256
1982	46,108	1,128		22,656	14,556	84,448
1983	47,040	708		20,748	9,456	77,952
1984	62,643	1,050		31,488	14,004	109,185
1985	37,452	462		22,254	8,544	68,712
1986	48,744	606		25,740	10,572	85,662
1987	60,525	576		21,222	10,332	92,655
1988	81,724	912		27,440	14,064	124,140
1989	66,470	816		26,134	12,552	105,972
1990	50,642	1,051		44,520	10,548	106,761
1991	62,672	1,320		29,160	11,532	104,684
1992	54,288	1,164		35,380	15,180	106,012
1993	39,210	774		35,988	13,118	89,090
1994	54,750	702		26,580	15,768	96,800
1995	42,784	602		34,020	14,844	92,250
1996	37,015	242		18,880	6,518	62,655
Ten Year Average (1986-95)	54,161	851		30,618	11,515	97,145

[a] The number of permits that made deliveries times the number of hours in the period.

Appendix A.7. Mean salmon weights and prices paid to commercial permit holders in the Kuskokwim Area, 1967-1996.

Year	Mean Weight - Pounds					Average Price - $/Pound				
	Chinook	Sockeye	Coho	Pink	Chum	Chinook	Sockeye	Coho	Pink	Chum
1967	27.8	7.4	5.9	a	7.0	0.13	0.05	0.09	a	0.04
1968	23.8	6.2	7.2	4.0	7.9	0.16	0.10	0.09	0.05	0.04
1969	19.6	6.2	7.3	3.6	5.8	0.19	0.15	0.10	0.06	0.07
1970	18.9	5.4	7.3	3.3	6.1	0.20	0.21	0.14	0.08	0.08
1971[b]	26.2	6.9	6.1	a	6.4	0.17	0.10	0.13	a	0.08
1972	a	a	a	a	a	0.20	a	0.16	a	0.08
1973	a	a	a	a	a	0.25	a	0.26	a	0.19
1974	a	a	a	a	a	0.46	0.34	0.27	0.23	0.25
1975	a	a	a	a	a	0.54	a	0.31	a	0.26
1976[c]	17.0	6.7	7.8	3.5	7.0	0.64	0.43	0.40	0.25	0.27
1977	22.7	8.3	7.8	3.9	7.3	1.15	0.45	0.65	0.25	0.45
1978	24.2	6.5	7.1	3.9	8.9	0.50	0.49	0.40	0.12	0.32
1979	16.6	6.9	7.9	3.9	7.0	0.66	0.53	0.75	0.11	0.37
1980	14.1	6.7	6.9	3.6	6.4	0.47	0.31	0.64	0.12	0.24
1981	17.8	7.2	6.4	3.5	7.5	0.84	0.61	0.63	0.11	0.23
1982	19.3	7.2	7.3	3.6	7.3	0.82	0.41	0.53	0.05	0.22
1983	18.8	6.8	6.8	3.5	7.4	0.54	0.51	0.39	0.05	0.33
1984	16.4	6.6	7.7	3.2	6.7	0.89	0.52	0.55	0.07	0.28
1985	17.0	7.0	7.5	3.6	7.1	0.71	0.59	0.51	0.05	0.25
1986	17.0	7.2	6.4	3.4	6.8	0.80	0.70	0.60	0.05	0.25
1987	15.2	7.5	7.2	3.7	6.8	1.10	1.30	0.73	0.10	0.27
1988	14.1	7.3	7.2	3.4	6.9	1.30	1.42	1.25	0.15	0.40
1989	16.6	7.2	7.3	3.4	6.8	0.75	1.20	0.55	0.05	0.26
1990	15.1	6.7	6.5	3.2	6.9	0.56	1.05	0.62	0.12	0.26
1991	15.3	6.9	6.5	3.4	6.3	0.56	0.67	0.45	0.12	0.31
1992	13.4	7.0	7.3	3.9	6.8	0.66	0.90	0.45	0.06	0.32
1993	14.3	7.1	6.6	3.4	6.5	0.62	0.70	0.58	0.25	0.40
1994	15.6	6.9	7.6	3.6	6.6	0.51	0.53	0.57	0.08	0.21
1995	17.3	6.9	7.2	3.7	6.9	0.60	0.71	0.41	0.12	0.18
1996	15.7	7.2	8.0	3.8	7.2	0.26	0.40	0.25	0.12	0.11
Ten Year Average (1986-95)	15.4	7.1	7.0	3.5	6.7	0.75	0.92	0.63	0.11	0.28

[a] Information unavailable.
[b] Information was not available for district 5.
[c] Information was not available for district 4.

Appendix A.8. Maximum, mean, and minimum number of permits used in a single period by district, 1962-1996.

	District 1			District 2			District 4			District 5		
Year	Max.	Mean	Min.	Max.	Mean	Min.	Max.	Mean	Min.	Max.	Mean	Min.
1962	190	121	25				32	19	7		Closed	
1963	103	17	1	17	10	2	30	13	1		Closed	
1964	113	30	1	30	4	1	29	15	1		Closed	
1965	164	43	1	5	3	1	31	13	1		Closed	
1966	172	122	61	1	1	1	12	8	1		Closed	
1967	208	144	10	4	2	1	19	8	1		Closed	
1968	262	164	2				78	38	8	17	13	5
1969	274	161	1	11	2	1	119	51	1	28	21	10
1970	320	198	22	11	6	3	75	48	21	25	16	5
1971	355	117	5	20	14	2	48	36	3	11	9	8
1972	341	149	28	12	10	8				12	9	5
1973	372	234	3	18	11	1	70	42	17	17	10	5
1974	444	272	25							40	23	7
1975	483	280	12				106	47	13	30	20	10
1976	495	357	174	55	33	11	99	44	5	35	13	4
1977	487	380	204	83	54	24	172	70	7	21	15	5
1978	509	390	72	24	12	3	123	38	3	24	15	5
1979	549	456	179	33	27	20	126	63	12	27	19	6
1980	482	421	319	37	23	12	101	56	3	35	22	9
1981	541	442	278	151	42	11	106	69	30	38	24	10
1982	499	414	302	47	7	10	107	67	5	30	25	7
1983	547	442	323	34	24	9	134	70	10	62	30	11
1984	542	411	39	33	17	8	165	82	34	47	38	29
1985	530	446	262	15	11	6	191	84	7	47	34	12
1986	600	489	234	27	9	3	216	86	2	52	31	19
1987	607	513	132	22	16	13	253	105	48	75	41	23
1988	640	583	408	21	17	13	202	73	9	68	39	22
1989	679	509	126	22	17	14	140	77	51	65	39	10
1990	653	614	534	18	16	14	218	106	1	58	27	1
1991	662	589	512	19	17	16	227	81	4	50	28	1
1992	653	577	374	21	15	9	187	86	19	91	34	17
1993	654	556	274	17	16	13	219	94	10	80	40	10
1994	606	501	157	17	13	6	171	69	13	88	34	2
1995	617	469	219	16	7	1	239	87	41	68	32	16
1996	541	351	194	6	3	1	120	65	41	40	28	13

Appendix A.9. Historical salmon escapement data from selected Kuskokwim Area projects, 1976-1996.

Year	Operating Period	Chinook	Sockeye	Chum	Pink	Coho
Kogrukluk River Weir						
BEG		**10,000**		**30,000**		**25,000**
1976	06/29 to 07/31	5,579	2,326	8,117	0	[b]
1977	07/14 to 07/27	1,945 [b]	1,637b	19,444	2	[b]
1978	06/28 to 07/31	13,667	1,670	48,125	2	[b]
1979	07/01 to 07/24	11,338	2,628	18,599	1	[b]
1980	07/01 to 07/11	6,572 [b]	3,200 [b]	41,777	1	[b]
1981	06/27 to 10/25	16,655	18,066	57,365	6	11,455
1982	07/09 to 09/14	10,993	17,297	64,077	19	37,796
1983	06/22 to 07/02	2,992 [b]	1,176 [b]	9,407 [b]	0	8,538
1984	06/19 to 09/15	4,928	4,133	41,484	0	27,595
1985	06/29 to 09/07	4,619	4,359	15,005	0	16,441
1986	07/06 to 10/05	5,038	4,224	14,693	0	22,506
1987	08/09 to 09/23	4,063 [b]	[b]	17,422 [b]	0	22,821
1988	07/05 to 09/17	8,505	4,397	39,540	0	13,512
1989	07/07 to 09/14	11,940 [b]	5,811 [b]	39,548	0	[b]
1990	06/28 to 09/07	10,218	8,406	26,765	1	6,132 [b]
1991	07/04 to 09/15	7,850	16,455	24,188	4	9,933
1992	07/01 to 08/21	6,755	7,540	34,105	11	26,057 [b]
1993	07/02 to 09/06	12,332	29,358	31,899	0	20,517 [b]
1994	07/02 to 09/10	15,227	14,192 [b]	46,192 [b]	23	34,695
1995	07/02 to 09/06	20,630	10,996	31,265	2	27,856
1996	06/29 to 09/15	14,199	15,381	48,494	6	50,555
Aniak River Sonar						
BEG				**250,000** [c]		
Non user-configurable, one-bank expanded estimates 1980 - 1995						
1980	06/22 to 07/30	56,469		1,169,470		
	08/16 to 09/12					81,556
1981	06/16 to 08/06	42,060		589,286		
1982	06/21 to 08/01	33,864		442,461		
1983	06/18 to 7/28	4,911		129,367		
1984	06/16 to 07/30			266,976		
1985	06/22 to 07/28			253,051		
1986	06/26 to 07/24			209,080		
1987	06/22 to 07/31			193,013		
1988	06/22 to 07/31			401,511		
1989	06/21 to 07/24			243,922		
1990	06/23 to 08/06			232,260		
1991	06/29 to 07/29			314,166		
1992	06/22 to 07/29			84,269		
1993	06/24 to 07/28			13,870		
1994	06/28 to 07/28			388,163		
1995	06/23 to 07/23			[d]		
User-configurable, two-bank estimates, 1996						
BEG				**250,000** [c]		
1996	06/21 to 07/28			302,106		

- continued -

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Year	Operating Period	Chinook	Sockeye	Chum	Pink	Coho
Kwethluk River						
Weir						
1992	06/18 to 09/12	9,675	1,316	30,596	45,952	45,605
Tower						
1996	06/22 to 07/27	7,859	2,075	27,462	2,899 [b]	180 [b]
Tuluksak River Weir						
1991	06/12 to 09/18	697	34	7,675	391	4,651
1992	06/24 to 09/10	1,083	129	11,183	2,458	7,501
1993	06/17 to 09/10	2,218	88	13,804	210	8,328
1994	06/29 to 09/11	2,922	94	15,707	3,450	8,213
George River Weir						
1996	06/21 to 07/26	7,487	98	17,570	644 [b]	173 [b]
Takotna River Tower						
1995	07/07 to 07/31	[b]	0	1,685 [b]	0	0 [b]
1996	06/15 to 07/26	402	0	2,806	0	0 [b]
Middle Fork Goodnews River Tower/Weir						
BEG		**3,500**	**25,000**	**15,000**		
Counting Tower, 1981 - 1991						
1981	06/13 to 08/15	3,688	49,108	21,827	1,327 [b]	356 [b]
1982	06/23 to 08/03	1,395	56,255	6,767	13,855 [b]	91 [b]
1983	06/11 to 07/28	6,022	25,813	15,548	34 [b]	0 [b]
1984	06/15 to 07/31	3,260	32,053	19,003	13,744 [b]	249 [b]
1985	06/27 to 07/31	2,831	24,131	10,367	144 [b]	282 [b]
1986	06/16 to 07/24	2,092	51,069	14,764	8,133 [b]	163 [b]
1987	06/22 to 07/30	2,272	28,871	17,517	62 [b]	62 [b]
1988	06/23 to 07/30	2,712	15,799	20,799	6,781 [b]	6 [b]
1989	06/29 to 07/31	1,915	21,186	10,380	24b [b]	1,212 [b]
1990	06/19 to 07/24	3,636	31,679	6,410	3,378 [b]	0 [b]
Weir, 1991 - 1996						
1991	06/29 to 08/24	1,952	47,397	27,525	1,694 [b]	1,978 [b]
1992	06/29 to 08/25	1,903	27,268	22,023	23,030 [b]	150 [b]
1993	06/22 to 08/18	2,317	26,044	14,472	253 [b]	1,374 [b]
1994	06/23 to 08/08	3,856	55,751	34,849	38,705 [b]	309 [b]
1995	06/19 to 08/28	4,836	39,009	33,699	330 [b]	5,415 [b]
1996	06/19 to 08/23	2,930	58,264	40,450	14,509 [b]	9,699 [b]
Kanektok River Tower						
1996	7/2-7/13; 7/20-7/25	6,827 [b]	71,637 [b]	70,617 [b]		

[a] Pink salmon can pass freely through the Kogrukluk River weir.

[b] No counts or incomplete count as project was not operated during a significant portion of the species' migration.

[c] Aniak River sonar counts after 1983 represent multiple species, however, chum salmon are assumed to be the dominate species during the operational period.

[d] Reliable escapement estimates are not available from Aniak River sonar for 1995.

Appendix A.10. Kuskokwim Area subsistence chinook salmon harvest by community, 1960 - 1996.

Community	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Kipnuk	248	11	123	75	a						
Kwigillingok	250	35	43	106	339	a	250	957	70		220
Kongiganak	b	b	b	b						385	891
Tuntutuliak	226	2,226	842	2,853	1,826	1,575	3,097	3,462	2,214	2,195	3,558
Eek				c	c	2,921	4,572	2,566	2,038	2,065	1,882
Kasigluk & Eek					1,857	3,123					
Kasigluk	135	1,215	127	1,302	c	c	1,032	2,766	1,485	2,888	3,931
Nunapitchuk	683	2,042	848	1,874	636	490	2,213	1,926	1,750	2,279	4,680
Atmautluak	b	b	b	b	b	b	b	b	b	b	1,205
Napakiak	1,830	2,573	2,191	3,148	2,677	2,872	3,658	3,895	2,468	3,546	4,960
Napaskiak	536	1,258	759	1,569	2,201	1,071	2,710	2,998	1,663	2,227	3,446
Oscarville	1,968	282	75	309	339	688	322	1,127	393	457	542
Bethel	1,923	4,150	1,378	7,019	4,114	3,371	8,046	13,925	6,205	7,472	17,026
Kwethluk	2,692	3,763	2,329	5,050	3,262	2,887	6,551	6,993	2,848	3,187	7,932
Akiachak	1,626	3,052	1,800	2,533	3,488	3,685	4,904	5,543	3,755	2,602	7,022
Akiak	1,865	3,159	906	2,869	2,495	1,345	3,670	3,660	1,822	1,275	3,290
Tuluksak	737	1,486	493	1,295	572	1,021	1,576	1,709	1,048	1,131	1,995
Lower Kalskag	961	571	c	c	710	c	c	c	1,502	2,102	2,146
Upper Kalskag	667	1,049	c	c	1,143	c	c	c	1,619	1,623	734
Kalskags Comb.			805	2,661		1,395	3,379	3,567			
Aniak	1,057	688	185	602	1,104	c	2,072	1,280	517	1,406	2,136
Aniak[d]					642						
Chuathbaluk	64	54	10	30	74	c	139	217	34	180	219
Napaimute	20	16	44	52	134	a	78	60	94	19	22
Crooked Creek	747	518	561	859	1,358	374	1,446	585	77	541	684
Georgetown							12		0	9	2
Red Devil	c	40	c	c	c	c			111	142	232
Sleetmute	c	222	c	c	c	c	303	343	207	267	161
Sleetmute[e]	465	262	144	228	314	79					
Kashegelok[f]							10				
Stony River	435	25	31		299	79	636	303	176	2,187	105
Lime Village										50	15
Mcgrath							300	25			
Takotna											
Nikolai											
Telida											
Quinhagak								1,349	2,756		
Goodnews Bay											
Platinum											
Total	18,887	28,934	13,582	34,482	29,017	24,697	49,325	61,262	35,698	40,617	69,612

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Community	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
Kipnuk[g]											
Kwigillingok[g]	200	10				75	382	75			
Kongiganak	41					122	361				
Tuntutuliak	1,841	3,214	2,859	1,577	3,492	4,807	2,470	1,656	2,268	2,545	4,446
Eek	1,969		1,981	2,356	2,110	3,232	2,675	1,807	2,003	1,557	1,731
Kasigluk	1,645	1,292	1,864	1,411	1,713	1,613	1,324	608	1,142	1,704	3,377
Nunapitchuk	1,978	2,496	2,663	1,165	2,092	2,578	2,622	2,178	2,109	2,612	2,918
Atmautluak	548	864	1,106	382	1,042	1,159	1,015	966	2,242	1,288	1,247
Napakiak	1,868	2,009	1,763	1,224	2,864	3,330	2,702	2,140	2,191	2,582	3,017
Napaskiak	1,916	1,578	2,048	900	2,303	3,566	1,989	2,122	2,085	3,160	2,911
Oscarville	570	196	586	180	891	623	672	349	629	477	495
Bethel	8,731	8,371	8,898	4,631	11,688	13,215	9,408	6,905	11,564	12,591	15,367
Kwethluk	5,564	5,137	3,444	2,694	3,179	4,193	5,563	3,172	6,919	7,627	6,167
Akiachak	4,818	3,872	2,592	1,726	3,534	4,915	5,407	2,951	4,818	5,405	3,094
Akiak	2,688	1,899	1,895	1,292	2,837	3,076	2,880	1,850	3,567	3,355	2,386
Tuluksak	1,280	1,318	1,322	883	1,338	1,411	2,906	1,906	1,489	2,807	2,446
Lower Kalskag	2,355	2,604	1,309	1,586	2,755	4,536	1,750	1,951	2,821	3,917	3,271
Upper Kalskag	601	401	938	463	1,752	1,413	2,813	1,253	1,590	1,889	1,171
Aniak	1,076	2,105	1,030	1,952	1,391	1,490	4,991	1,331	2,634	2,750	3,102
Chuathbaluk	179	261	942	674	594	657	1,507	1,238	2,189	1,507	841
Napaimute	17	20	13	6	16	420	176	144	149	90	45
Crooked Creek	291	183	269	650	238	264	619	488	728	654	512
Georgetown							66			93	
Red Devil	135	182	138	205	623	195	324	153	488	255	298
Sleetmute	181	69	504	269	256	356	684	300	755	220	728
Kashegelok[f]						156	233	92			
Stony River	402	95	287	439	761	620	33	182	171	332	233
Lime Village	2,119				100	33			38		
McGrath									581		
Takotna									65		
Nikolai									60		500
Telida											
Quinhagak							2,012	2,328	1,420	1,940	2,562
Goodnews Bay							574		228	498	1,309
Platinum									110	192	100
Total	43,013	38176	38,451	26,665	47,569	58,055	58,158	38,145	57,053	62,047	64,274

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Community	1982	1983	1984	1985	1986	1987	1988[1]	1989	1990	1991	1992
Kipnuk[g]	60							54	108	80	
Kwigillingok[g]											9
Kongiganak	52			235			585	1,412	1,442	755	904
Tuntutuliak	1,984	2,523	3,519	2,644	2,452	2,522	2,741	3,781	4,044	4,143	3,416
Eek	2,578	2,040		1,436			2,212	1,580	4,913	2,301	2,083
Kasigluk	3,115			2,054			1,367	2,194	3,101	2,955	94
Nunapitchuk	2,577	2,688		2,019	3,410	3,372	2,297	3,170	3,199	3,938	3,575
Atmautluak	1,752			1,559			1,131	1,227	2,569	1,784	1,422
Napakiak	3,500	2,047		1,805		2,760	3,091	3,710	4,158	2,543	3,328
Napaskiak	2,872			2,155		2,907	3,898	4,699	4,972	3,864	4,133
Oscarville	523			916		745	415	1,591	898	1,422	122
Bethel	13,516	8,492	11,066	6,940	11,984	8,107	15,038	24,929	19,670	29,445	17,364
Kwethluk	5,897		6,732	4,937	5,824	8,779	10,976	7,988	9,215	7,511	6,504
Akiachak	4,468		5,588	3,254		4,871	9,563	5,559	7,043	5,657	4,243
Akiak	2,745		3,413	2,975		3,683	3,706	4,811	5,108	3,247	3,207
Tuluksak	2,220	1,671	2,286	2,749		3,712	3,289	3,791	1,834	3,351	2,382
Lower Kalskag	2,594		3,242	1,707	1,666		3,024	3,380	2,426	3,845	2,269
Upper Kalskag	963		657	605	587		859	1,256	1,558	987	1,366
Aniak	2,071	3,174	1,847	1,828	4,624	2,131	4,071	3,406	3,123	3,260	3,925
Chuathbaluk	1,491			1,102			34	403	1,674	791	933
Napaimute	138			53							
Crooked Creek	515			218			618	451	929	947	442
Red Devil	273			176			263	189	273	168	328
Sleetmute	242		154	745			433	420	711	770	801
Stony River	419			167			315	692	498	586	209
Lime Village							341	105	240	60	
McGrath	160	830	730	59			440	522	1,171	880	1038
Takotna							100	62	62	0	0
Nikolai	778	750	795	615			136	716	560	337	605
Telida								1			0
Quinhagak	2,402	2,542	3,109	2,341	2,682	3,663	3,690	3,542	5,942	3,693	3,447
Goodnews Bay	1,185	1,004	597	399	513	640	289	419	351	894	292
Platinum	51	62	32	27	42	176	21	48	188	20	56
Mekoryuk[g]											
Newtok[g]							14	5	1		
Nightmute[g]							17		3	20	
Toksook Bay[g]							81	127	143	25	49
Tununak[g]							52	5		15	
Other											21
Total	61,141	51,020[h]	60,668[h]	45,720	54,255[h]	71,804[h]	75,107	86,245	92,127	90,294	68,567

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Community	1993	1994	1995	1996
Kipnuk[9]	348	150		
Kwigillingok[9]	80	7		15
Kongiganak	781	1,271	843	830
Tuntutuliak	3,716	4,679	4,023	3,996
Eek	2,550	2,917	3,535	2,568
Kasigluk	548	694	392	579
Nunapitchuk	3,749	4,746	4,400	3,234
Atmautluak	1,818	1,819	1,918	1,752
Napakiak	3,972	3,545	3,902	3,784
Napaskiak	5,671	6,356	4,984	4,368
Oscarville	1,475	1,385	1,438	996
Bethel	22,160	24,531	29,863	21,332
Kwethluk	9,070	9,262	9,264	9,183
Akiachak	7,110	8,081	6,571	5,209
Akiak	4,280	4,759	4,118	4,569
Tuluksak	3,755	4,640	4,333	3,073
Lower Kalskag	3,955	3,976	5,321	2,870
Upper Kalskag	1,679	1,340	1,396	1,351
Aniak	4,618	3,413	3,532	3,223
Chuathbaluk	1,447	1,043	2,615	1,152
Crooked Creek	771	968	934	855
Red Devil	449	409	425	337
Sleetmute	1,767	1,327	885	1,230
Stony River	445	359	559	597
Lime Village	41	216	144	48
McGrath	567	1,052	819	1,273
Takotna	0	0		
Nikolai	475	472	979	305
Telida				
Quinhagak	3,368	3,995	2,812	3,164
Goodnews Bay	628	744	902	403
Platinum	80	72	25	12
Mekoryuk[9]		6		
Newtok[9]		2		
Nightmute[9]		8		
Toksook Bay[9]	128	341	94	45
Tununak[9]	5			
Total	91,506	98,585	101,026	82,353

-continued-

a Data collected, combined with unspecified village or villages.
b Village not yet founded.
c Data collected, but reported with another village.
d Aniak, Chuathbaluk and Russian Mission.
e Sleetmute to Red Devil.
f Kashegelok and Holitna.
g Reported catch only.
h Kuskokwim Area total estimate based on a village subsistence survey.
i Beginning in 1988, estimate based on new formula, data not comparable to previous years.

Appendix A.11. Kuskokwim Area subsistence sockeye salmon harvest by community, 1985 - 1996.

Community	1985	1986	1987	1988[c]	1989	1990	1991	1992	1993	1994	1995	1996
Kipnuk[a]					402	175	136		90	132		
Kwigillingok[a]									140	5		10
Kongiganak	130			830	658	423	517	905	705	702	530	722
Tuntutuliak	1,498	288	991	600	1,173	1,954	1,768	1,835	977	3,185	1,134	1,501
Eek	241			336	170	1,177	477	623	395	461	283	478
Kasigluk	1,138			376	235	793	1,421	81	122	275	165	588
Nunapitchuk	1,447	905	1,187	884	1,026	1,097	2,184	2,273	2,503	1,555	882	1,735
Atmautluak	1,308			320	1,143	1,501	881	1,304	1,387	796	1,099	1,416
Napakiak	1,242		1,439	1,067	1,752	1,375	1,176	1,315	1,150	1,627	959	1,083
Napaskiak	1,181		2,199	1,120	721	1,227	2,673	2,428	3,495	1,933	1,605	2,398
Oscarville	942		438	1,752	404	153	711	35	932	324	414	212
Bethel	3,409	7,730	3,810	5,614	7,356	6,404	17,805	7,194	10,540	8,571	8,286	7,310
Kwethluk	5,584	5,423	3,845	5,190	2,494	4,055	3,723	1,829	3,745	3,742	2,466	4,035
Aklachak	3,182		3,532	4,890	2,420	3,120	4,123	3,153	4,467	3,323	2,019	2,607
Akiak	1,368		1,883	1,378	2,492	1,672	1,708	1,458	3,558	1,786	643	1,449
Tuluksak	1,620		1,733	1,493	2,314	1,094	3,595	2,034	2,492	1,426	1,244	1,051
Lower Kalskag	948	783		1,581	769	828	1,062	467	2,357	950	681	1,144
Upper Kalskag	187	1,182		345	338	287	268	333	349	298	55	294
Aniak	2,116	2,652	2,101	1,078	959	1,329	2,069	1,166	1,578	571	1,007	1,290
Chuathbaluk	1,797			44	215	1,178	1,246	471	823	995	472	744
Napaimute	125											
Crooked Creek	1,218			327	436	1,556	998	458	831	512	192	304
Red Devil	205			437	356	445	426	315	662	337	620	977
Sleetmute	1,351			898	776	1,060	1,164	855	1,609	1,158	1,083	1,304
Stony River	585			195	1,084	835	1,912	1,316	1,488	802	1,342	1,218
Lime Village					5,653	2,333	956		2,800	1,760	700	500
McGrath			0	0	0	0	0	0	0	0	0	0
Takotna			0	0	0	0	0	0	0	0	0	0
Nikolai			0	0	0	0	0	0	0	0	0	0
Telida				0	0	0	0	0	0	0	0	0
Quinhagak	106	423	1,067	1,261	633	1,928	1,772	1,264	1082	1,000	587	405
Goodnews Bay	562	860	834	898	710	970	1,132	612	784	701	230	411
Platinum	142	83	121	167	151	153	133	158	51	101	34	7
Mekoryuk[a]				1		50	1		1	87		
Newtok[a]					10	3				20		
Nightmute[a]						10	210			15		
Toksook Bay[a]					277	242	105	1	66	228	5	5
Tununak[a]					83	7	50		30			
Other[a]								1	1			
Total	33,632	20,239[b]	25,180[b]	33,102	37,210	39,434	56,402	33,884	51,210	39,378	28,737	35,198

a Reported harvest only.
b Estimated total based on sampled villages.
c Beginning in 1988, estimate based on new formula, data not comparable to previous years.

Appendix A.12. Kuskokwim Area subsistence coho salmon harvest by community, 1985 - 1996.

Community	1985	1986	1987	1988[c]	1989	1990	1991	1992	1993	1994	1995	1996
Kipnuk[a]					200	460	30		25	185		
Kwigillingok[a]									80			5
Kongiganak	88			1,146	562	413	524	544	502	566	605	421
Tuntutuliak	371	1,692	760	754	508	1,135	729	737	837	441	365	1,311
Eek	406			291	349	1,620	334	500	200	426	347	389
Kasigluk	1,763			906	772	938	1,769	174	228	387	518	368
Nunapitchuk	513	1,084	696	898	469	573	1,119	2,226	316	781	641	1,310
Atmautluak	326			337	971	350	254	518	426	411	566	522
Napakiak	836		959	588	1,757	1,700	597	1,237	590	920	390	600
Napaskiak	415		629	1,503	1,130	922	754	866	783	2,012	580	390
Oscarville	155		40	50	430	43	136			49		19
Bethel	6,094	19,351	8,077	8,291	22,820	19,433	29,062	15,940	13,809	12,271	20,132	13,325
Kwethluk	3,041	3,545	2,537	5,240	3,917	3,926	2,380	2,325	1,816	1,816	1,284	3,195
Akiachak	967		286	7,927	1,890	1,592	2,393	2,147	1,326	1,531	677	850
Akiak	1,270		1,294	1,577	4,959	1,591	2,231	1,137	1,315	1,110	501	972
Tuluksak	1,723		337	1,537	1,483	924	1,903	1,544	412	292	531	1,091
Lower Kalskag	596	2,211		158	981	365	497	469	786	845	718	1,022
Upper Kalskag	105	759		136	688	300	510	931	354	184	167	360
Aniak	1,552	1,051	2,302	1,903	2,640	1,454	1,165	1,831	1,091	1,682	1,304	2,679
Chuathbaluk	393			72	272	813	93	349	366	795	84	440
Napaimute	211											
Crooked Creek	290			89	530	886	277	413	409	581	381	171
Red Devil	846			672	1,591	866	1,132	1,160	1,673	1,077	1,557	1,274
Sleetmute	1,330			1,776	1,009	1,023	1,557	1,132	880	649	1,075	846
Stony River	395			161	611	423	502	670	512	505	1,083	571
Lime Village				1,055	2,025	538	336	300	618	960	246	
McGrath				790	534	2,294	882	2,780	1,989	2,558	2,287	972
Takotna				0	40	0	0	0	0	0		0
Nikolai	550			530	328	73	66	173	267	125	545	64
Telida					60			0				
Quinhagak	67	41	125	4,317	3,787	4,125	3,232	2,958	2,152	2,739	2,625	1,497
Goodnews Bay	210			1,072	830	1,556	1,789	1,062	1,197	452	313	293
Platinum	11	8	43	90	77	90	34	190	29	77	9	59
Mekoryuk[a]					106	52	130	2	53	87		3
Newtok[a]					15	4						
Nightmute[a]					70		20					
Toksook Bay[a]					35	46	1	15	57	116	22	135
Tununak[a]					9				70			
Other[a]							39					
Total	24,524	29,742[b]	18,085[b]	43,866	58,455	50,528	56,477	44,330	35,168	36,630	39,553	35,154

a Reported harvest only.
b Estimated total based on sampled villages.
c Beginning in 1988, estimate based on new formula, data not comparable to previous years.

Appendix A.13. Kuskokwim Area subsistence chum salmon harvest by community, 1985 - 1996.

Community	1985	1986	1987	1988[c]	1989	1990	1991	1992	1993	1994	1995	1996
Kipnuk[a]						540	205		601	214		
Kwigillingok[a]									200	5		30
Kongiganak	671			1,473	1,967	980	1,008	1,524	811	1,340	1,275	1,331
Tuntutuliak	4,346	2,734	5,385	4,700	5,068	6,250	4,755	5,863	2,967	5,232	3,488	5,744
Eek	401			1,323	972	3,090	794	1,313	237	624	815	923
Kasigluk	4,199			3,541	3,058	3,335	3,137	26	374	537	457	1,196
Nunapitchuk	4,346	4,676	4,621	7,331	6,923	5,240	5,810	8,229	4,774	4,587	4,297	5,833
Atmautluak	4,440			4,695	3,014	4,006	2,394	3,183	1,345	1,455	3,466	2,599
Napakiak	3,686		2,784	4,535	7,068	8,389	2,340	4,401	2,281	4,096	3,084	4,249
Napaskiak	5,810		6,832	11,623	13,079	8,166	6,582	6,061	3,622	5,605	4,271	4,886
Oscarville	1,294		1,135	2,461	1,341	925	1,141	29	566	676	1,018	1,552
Bethel	9,260	14,778	7,974	17,442	25,661	18,457	22,966	14,943	9,203	12,410	15,996	16,844
Kwethluk	6,866	9,736	7,636	21,352	10,341	11,102	5,497	7,647	3,450	6,102	6,114	11,870
Akiachak	5,931		4,355	17,749	7,913	8,971	5,994	5,882	3,436	6,286	4,074	4,993
Akiak	6,724		3,837	6,699	13,000	8,136	6,668	5,907	7,549	4,599	1,878	4,640
Tuluksak	6,064		3,466	7,046	9,796	5,712	5,695	4,798	3,834	2,533	2,609	3,095
Lower Kalskag	4,637	2,538		8,232	4,976	4,098	2,815	2,758	3,087	2,758	1,455	3,357
Upper Kalskag	1,855	3,684		3,317	3,427	1,321	2,438	2,843	578	864	1,351	1,521
Aniak	8,804	5,905	5,751	11,628	10,404	8,901	3,564	7,777	2,900	2,612	3,683	8,533
Chuathbaluk	3,782			450	2,051	4,510	1,912	2,502	2,895	1,615	1,807	2,365
Napaimute	414											
Crooked Creek	2,888			768	779	2,884	1,367	848	715	649	358	347
Red Devil	1,021			3,168	1,376	1,466	1,236	1,523	927	1,322	882	787
Sleetmute	3,689			4,873	1,813	1,874	1,862	3,151	681	1,533	1,758	1,215
Stony River	722			3,405	1,352	1,132	602	1,201	775	932	1,375	443
Lime Village				913	2,100	2,500	715		508	2,080	920	500
McGrath				639	1,380	2,703	1,068	2,854	590	1,294	1,531	218
Takotna				200	250	56	0	0	0	0		10
Nikolai	2,909			2,404	1,221	882	396	818	353	308	301	249
Telida					15			0				
Quinhagak	901	808	1,084	1,065	1,568	3,197	1,593	1,833	1,008	1,452	703	988
Goodnews Bay	339	188	371	405	620	193	144	843	188	444	160	214
Platinum	9	3	207	43	164	139	4	85		45	3	5
Mekoryuk[a]				500	2,915	1,067	1,178		808	2,337		
Newtok[a]					20	4						
Nightmute[a]					30	35	60			7		
Toksook Bay[a]					86	224	103	246	296	660	239	124
Tununak[a]					16	65	150		30			
Other[a]							3	1				
Total	95,999	142,930[b]	70,709[b]	153,980	145,764	130,550	96,196	99,089	61,589	77,213	69,368	90,761

a Reported harvest only.
b Estimated total based on sampled villages.
c Beginning in 1988, estimate based on new formula, data not comparable to previous years.

APPENDIX B

Appendix B.1. Kuskokwim River distances[a].

Location	Distance from the Mouth		Distance from Bethel	
	Kilometer	Miles	Kilometer	Miles
Popokamiut (Lower boundary District 1)	-3	-2	-129	-80
Kuskokwim River Mouth 60.80 N, 162.42 W	0	0	-125	-78
Eek Island, Southernmost tip, (Lower boundary District 1)	19	12	-106	-66
Apokak Slough (Lower boundary District 1)	35	22	-90	-56
Eek River	39	24	-87	-54
Kwegooyuk	42	26	-84	-52
Kinak River	48	30	-78	-48
Tuntutuliak Village	56	35	-87	-54
Kialik River	59	37	-66	-41
Fowler Island	83	52	-42	-26
Johnson River	93	58	-32	-20
Napakiak Village	104	65	-21	-13
Napaskiak Village	115	71	-12	-7
Oscarville Village	115	71	-11	-7
Bethel City	125	78	0	0
Gweek River	145	90	20	12
Kwethluk Village	159	99	34	21
Akiachak Village	169	105	43	27
Kasigluk River	173	108	48	30
Kisaralik River	175	109	50	31
Akiak Village	190	118	64	40
Mishevik Slough,	212	132	87	54
Tuluksak Village	218	136	93	58
Nelson Island	220	137	95	59
(District 1 Boundary), Bogus Creek	234	146	109	68
High Bluffs	264	164	139	86
Boundary of District 2	295	183	170	105
Mud Creek Slough	297	185	172	107
Kalskag Village	309	192	184	114
Aniak Village, Aniak River	362	225	237	147
Chuathbaluk Village (Upper boundary District 2)	375	233	250	155
Kolmakof River	395	246	270	168
Napaimiut Village	410	255	285	177

(continued)

Location	Distance from the Mouth		Distance from Bethel	
	Kilometer	Miles	Kilometer	Miles
Holokuk River	415	258	290	180
Oskawalik River	449	279	324	201
Crooked Creek Village	466	290	341	212
Georgetown Village, George River	497	309	372	231
Red Devil Village	526	327	401	249
Sleetmute village	539	335	414	257
Holitna River	540	336	415	258
Stony River Village	585	364	460	286
Stony River	587	365	462	287
Swift River	611	380	486	302
Tatlawisksuk River	616	383	491	305
Devil's Elbow	645	401	520	323
Vinasale	740	460	615	382
McGrath Village	815	507	690	429
Middle Fork	889	553	764	475
Big River	801	560	776	482
Pitka Fork	920	572	795	494
Medra Village	928	577	803	499
South Fork	931	579	806	501
East Fork	943	586	818	508
North Fork	943	586	818	508
Nikolai Village	999	621	874	543
Swift Fork	1,136	706	1,011	628
Telida Village	1,184	736	1,059	658
Highpower Creek	1,200	746	1,075	668
Fish Creek	1,284	798	1,159	720
North Fork Lake	1,334	829	1,209	751
Top of Kuskokwim Drainage	1,498	931	1,373	853

a These distances were taken from the USGS 1:36,300 series of topographic maps. The "mouth" was defined as the point where the "grassland" banks are 24 miles apart. Some locations are not on the mainstem of the Kuskokwim River, as a result their mileages appear to be out of sequence since they are listed in the order of the turn off.

Appendix B.2. Peak aerial survey counts of chinook salmon in indexed Kuskokwim River spawning tributaries, 1975 - 1996[a].

	Lower Kuskokwim				Middle Kuskokwim							Upper Kuskokwim	
Year	Eek	Kwethluk Canyon C.	Kisaralik	Tuluksak	Aniak	Kipchuk (Aniak)	Salmon (Aniak)	Holokuk	Oskawalik	Holitna	Kogrukluk Weir	Cheeneetnuk	Salmon (Pitka)
1975			118			94		17	71	1,114			
1976				139		177		126	204	2,571	5,579	1,197	1,146
1977		2,290		291			562	60	276			1,399	1,978
1978	1,613	1,732	2,417	403			289			2,766	13,667	267	1,127
1979		911						113			11,338		699
1980	2,378			725			1,186	250	123				1,177
1981		1,783	672		9,074		894				16,655		1,474
1982	230				2,645		185	42	120	521	10,993		419
1983	188	471	731	129	1,909		231	33	52	1,069		243	586
1984		273	157	93	1,409					299	4,926	1,177	577
1985	1,118	629		135				135	61		4,619	1,002	625
1986					909		336	100		850	5,038	381	
1987	1,739	975		60		193	516	208	193	813		317	
1988	2,255	766	840	188	945		244	57	80		8,506		501
1989	1,042	1,157	152		1,880	994	631				11,940		446
1990	1,983	1,295	631	166	1,255	537	596	143	113		10,218		
1991	1,312	1,002		342	1,564	885	583				7,850		
1992					2,284	670	335	64	91	1,822	6,755	1,050	2,555
1993					2,687	1,248	1,082	114	103	1,573	12,332	678	1,012
1994		848	1,021		1,848	1,520	1,218				15,227	1,206	1,010
1995			1,243		3,174	1,215	1,442	181	289	2,787	20,630	1,565	1,911
1996					3,496		983	85			14,199		
BEG	1,460[b]	**1,200[c]**	**1,000[c]**	**400[c]**	**1,500[c]**	670[b]	**600[c]**	107[b]	108[b]	**2,000[c]**	**10,000[c]**	1,002[b]	**1,300[c]**

[a] Estimates are from "peak" aerial surveys conducted between 20 and 31 July under fair, good, or excellent viewing conditions.
[b] Median of years 1975 through 1994.
[c] Formally established BEG (Buklis 1993).

Appen. . Historical daily and cumulative CPUE for chinook salmon catches in the Bethel test fishery, 1996.

Date	Daily CPUE												Cumulative CPUE											
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
6/01	0				0	0		0	3	3	3	3	0				0	0		0	3	3	0	3
6/02	0			3	0	2	0	0	4	2	3	10	0			3	0	2	0	0	7	5	3	13
6/03	0	0		0	0	0	0	0	10	3	1	5	0	0		3	0	2	0	0	17	7	3	18
6/04	0	3	0	0	0	1	0	0	3	2	1	17	0	3	0	3	0	3	0	0	20	9	4	35
6/05	0	1	5	2	0	1	1	0	8	11	3	12	0	4	5	5	0	4	1	0	28	20	7	47
6/06	0	1	3	0	0	1	3	2	11	15	2	19	0	6	8	5	0	6	4	2	39	35	9	66
6/07	0	5	5	3	2	3	6	0	5	2	10	19	0	10	13	8	2	8	10	2	45	37	19	84
6/08	0	0	16	22	7	4	2	3	8	5	15	6	0	10	29	30	8	13	11	5	52	42	34	90
6/09	0	1	9	14	9	5	1	6	29	5	2	15	0	12	38	44	17	17	13	11	81	47	36	105
6/10	0	0	20	5	15	8	0	7	16	2	10	20	0	12	59	49	32	25	13	18	97	48	46	125
6/11	0	0	18	21	4	14	3	21	3	0	10	25	0	12	77	71	36	39	16	39	100	48	55	150
6/12	0	0	22	16	9	14	0	22	20	7	17	19	0	12	98	89	45	53	16	61	120	55	73	169
6/13	0	0	13	11	11	6	2	21	14	16	16	33	0	12	112	100	56	58	17	82	134	71	89	202
6/14	0	1	21	3	27	2	2	18	10	52	10	45	0	13	133	103	83	61	19	100	143	123	99	247
6/15	0	9	10	8	19	9	1	11	22	15	3	16	0	22	143	111	102	69	20	111	166	138	102	262
6/16	0	20	11	8 c	7	11	3	21	17	13	3	26	0	42	154	119 c	109	81	23	132	182	151	105	288
6/17	0	14	54	21	21	6	3	24	37	14	11	25 c	0	56	208	140	130	87	26	156	220	164	116	313 c
6/18	0	4	14 c	7	35	13	12	9 c	30	2	24	8	0	59	222 c	147	165	100	38	165 c	250	166	140	322
6/19	0	15	13	13	19 c	26	6	5	29	22	31	11	0	74	235	160	185 c	126	43	170	279	188	171	333
6/20	1 c	3	18	25 c	16	9 c	15 c	9	30	13	8	15 c	1 c	77	253	185 c	201	135 c	59 c	179	309	201	179	348 c
6/21	7	17	23	16	14	12	6	9	27	20	29	22	8	94	277	201	215	146	64	188	336	221	208	370
6/22	0	15	30	13	17	19	4	0 c	31	29	11 c	6	8	109	306	214	231	165	68	188 c	367	251	219 c	376
6/23	3	14	26	16	23 c	9	6	6	13	12	22	10	11	123	333	231	255 c	174	74	194	380	263	241	386
6/24	0 c	13	9 c	21 c	21	24	6 c	14	21	3 c	25	13 c	11 c	136	342 c	252 c	276	198	80 c	208	401	266 c	266	399 c
6/25	4	1	38	8	26	34 c	7	12 c	8 c	10	22	7	15	138	379	260	302	232 c	87	220 c	409 c	276	288	406
6/26	0	5 c	20	10	48 c	31	4	11	2	2	35 c	6	15	143 c	400	270	350 c	263	91	230	410	278	323 c	412
6/27	3 c	8	25	14	50	13	2	9	5	11	12	3	18 c	151	425	284	401	276	93	239	416	289	335	415
6/28	8	0	15	5 c	11	25	7	13	5	3	5	9	26	151	440	289 c	412	301	99	252	420	292	340	423
6/29	9	3	18	3	3	21 c	16	11 c	7	15	19 c	3	35	154	458	292	415	322 c	116	263 c	427	307	359 c	426
6/30	4	3 c	12 c	3	22 c	0	9	6	12	7	15	4	38	156 c	471 c	295	437 c	322	125	268	440	314	374	430
7/01	12 c	7	15	12	11	2	9 c	11	3	5	13	0	51 c	163	486	307	448	324	133 c	279	443	318	387	430
7/02	1	6	9	1 c	3	9	8	6	4	3	3	2 c	52	169	495	308 c	451	333	141	285	446	322	390	432 c
7/03	9	7 c	3 c	5	9 c	17	6	7	3	5	9 c	0	60	176 c	498 c	313	461 c	350	147	293	450	327	399 c	432
7/04	6 c	3	8	5	7	20	6	10	3	3	9	2	67 c	179	506	318	468	370	153	303	453	330	408	434
7/05	9	3	7	8 c	10 c	5 c	1	3	0	5	7	4 c	76	182	513	326 c	477 c	375 c	154	306	453	334	415	438 c
7/06	8	1	9	0	2	6	2 c	0 c	0	5	0 c	4	85	183	522	326	479	381	156 c	306 c	453	339	415 c	442
7/07	3	1 c	15 c	0	9	8	3	0	2	11	3	2	87	184 c	537 c	326	488	388	159	306	455	350	418	444
7/08	5	4	0	0 c	4 c	14	2	3	2	2	5	2 c	93	189	537	326 c	492 c	403	160	309	457	352	423	445 c
7/09	5	3	1	0	5	5 c	0	0	4	3	6	2	98	191	538	326	496	408 c	160	309	461	355	429	447
7/10	1	0 c	3	0	4	0	2	3	2	0	0 c	3	99	191 c	541	326	500	408	162	313	464	355	429 c	450
7/11	2	2	2 c	0 c	0 c	0	0	4	2	0	2	2	102	193	543 c	326 c	500 c	408	162	317	466	355	431	452
7/12	1	0	2	0	1	4	0	4	2	0	0	0 c	103	193	545	326	501	411	162	321	468	355	431	452 c
7/13	1	0	2	0	0	2	2 c	4	0	0	0	2	105	193	548	326	501	414	163 c	325	468	355	431	453
7/14	0	1	1	8 c	0 c	2 c	1	0	0	0 c	0 c	0	105	194	549	334 c	501 c	416 c	165	325	468	355 c	431 c	453
7/15	2	0	0 c	0	0	2	1	0	0	0	0	0	106	194	549 c	334	501	418	166	325	468	355	431	453
7/16	0	0	0	6	0	2	2	4	0	0	0	0 c	106	194	549	341	501	420	168	329	468	355	431	453 c
7/17	1	0	3	6	1	2	0	5	2	0	0	0	107	194	551	347	503	422	168	335	470	355	431	453
7/18	0	0	0	2 c	2 c	0	2 c	6	0	2	0 c	0	107	194	551	349 c	504 c	422	170 c	341	470	357	431 c	453

- continued -

Date	Daily CPUE												Cumulative CPUE											
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
7/19	0	0	14	0	1	0	2	3	2	2 c	0	0 c	107	194	566	349	505	422	172	344	473	359 c	431	453 c
7/20	0	0	1 c	0	5	0	0	0	0	0	2	0	107	194	567 c	349	510	422	172	344	473	359	433	453
7/21	0	2	2	0 c	1	0	0	0	0	0	0 c	0	107	196	569	349 c	511	422	172	344	473	359	433 c	453
7/22	0	2	0	0	6	4	0 c	0	0	0	0	0 c	107	198	569	349	516	425	172 c	344	473	359	433	453 c
7/23	0	0	3	0	0	0	0	0	0	0 c	0	0	107	198	572	349	518	425	172	344	473	359 c	433	453
7/24	0	3	0	1	0	2	0	0	0	0	0	0	107	201	572	350	518	427	172	344	473	359	433	453
7/25	0	0	0	0 c	0	0	0 c	0	0	0	0	2 c	107	201	572	350 c	518	427	172 c	344	473	359	433	455 c
7/26	0	0	0	2	0	4	0	0	0	0 c	0	2	107	201	572	352	518	431	172	344	473	359 c	433	456
7/27	2	0	4	2	0 c	0	0	0	0	0	4	0	109	201	577	354	518 c	431	172	344	473	359	438	456
7/28	0	0	0	0 c	0	2	0	0	0	0	0	0	109	201	577	354 c	518	433	172	344	473	359	438	456
7/29	2	0	0	0	0	4	0 c	0	0	0 c	0	0 c	111	201	577	354	518	438	172 c	344	473	359 c	438	456 c
7/30	0	0	0	4	0	0	0	0	0	0	2	0	111	201	577	358	518	438	172	344	473	359	440	456
7/31	0	0 c	0	0	0	0	0	0	0 c	0	0	2 c	111	201 c	577	358	518	438	172	344	473 c	359	440	458 c
8/01	0	0	0	0 c	0	0 c	0 c	0	0	0	0	0	111	201	577	358 c	518	438 c	172 c	344	473	359	440	458
8/02	0 c	0	0	0	1	0	0	0	0	0	0	0	111 c	201	577	358	519	438	172	344	473	359	440	458
8/03	0	0	1	0	0 c	0	0	0 c	0	0	0	0 c	111	201	578	358	519 c	438	172	344 c	473	359	440	458 c
8/04	0	0 c	0	0 c	0	0	0	0	0 c	0 c	0 c	0	111	201 c	578	358 c	519	438	172	344	473 c	359 c	440 c	458
8/05	0 c	0	0	0	0	0	0 c	0	0	0	0	0	111 c	201	578	358	519	438	172 c	344	473	359	440	458
8/06	0	0	0 c	0	0	0	2 c	0	0 c	0 c	0	0	111	201	578 c	358	519	439 c	172	344 c	473 c	359	440	458
8/07	0	0 c	2	0	0 c	0	0	2	0	0	0	0 c	111	201 c	580	358	519 c	439	172	347	473	359	440	458 c
8/08	2 c	0	0	0 c	0	0	0 c	0	0	0	0 c	0	113 c	201	580	358 c	519	439	172 c	347	473	359	440 c	458
8/09	0	0	0	0	1 c	0	0	0	0 c	0 c	0	0	113	201	580	358	520	439	172	347	473 c	359 c	440	458
8/10	0	0	0	0 c	0	2 c	0	0	0	0	0	0 c	113	201	580	358 c	520	441 c	172	347	473	359	440	458 c
8/11	0	0 c	2	3	0	0	0	0 c	0	0	0	0	113	201 c	582	361	520	441	172	347 c	473	359	440	458
8/12	0 c	0	0	0 c	0 c	0 c	0	0 c	0	0 c	0 c	0	113 c	201	582	361 c	520 c	441	172 c	347	473	359 c	440 c	458
8/13	0	0 c	0 c	0	2	0 c	0	0	0	0	0	0 c	113	201 c	582 c	361	522	441 c	172	347	473	359	440	458 c
8/14	0	0	0	0	0	0	0 c	0 c	0 c	0	0	0	113	201	582	361	522	441	172 c	347 c	473 c	359	440	458
8/15	0 c	0 c	0	0 c	0 c	2	0	0	0	0 c	0	0	113 c	201 c	582	361 c	522 c	443	172	347	473	359 c	440	458
8/16	0	0	0	0	0	0 c	0	0	0	0	0 c	0 c	113	201	582	361	522	443 c	172	347	473	359	440 c	458 c
8/17	0	0	0 c	0	0	0	0	0	0 c	0 c	0	0	113	201	582 c	361	522	443	172	347 c	473 c	359	440	458
8/18	0	0 c	0	0 c	0 c	0	0	0	0	0 c	0	0	113	201 c	582	361 c	522 c	443	172	347	473	359 c	440	458
8/19	0 c	0	0 c	0	0	0	0	0 c	2	0	0	0	113 c	201	582 c	361	522	443	172 c	349	473	359	440 c	458
8/20	1	0	0	0 c	2	0 c	0	0	0 c	0	0	0 c	114	201	582	361 c	523	443 c	172	349 c	473	359	440	458 c
8/21	0	0 c	0 c	0	0	0	0	0	0	0 c	0	0	114	201 c	582 c	361	523	443	172	349	473 c	359	440	458
8/22	0 c	0	0	0	0	0	0	0	0	0	0 c	0	114 c	201	582	361	523	443	172	349	473	359 c	440 c	458
8/23	0	0	0	0	0 c	0	0	0	0	0	0	0 c	114	201	582	361	523 c	443	172	349	473	359	440	458 c
8/24	0	0	0 c	0	0	0	0	0	0 c	0	2	0	114	201	582 c	361	523	443	172	349 c	473	362	440	458
8/25	0	0 c	0	0	0	0	0	0	0	0 c	0 c	0	114	201 c	582	361	523	443	172	349	473 c	362 c	440	458
8/26	0 c	0	0	0	0	0 c	2	0 c	0	0	0	0 c	114 c	201	582	361	523 c	445	172 c	349	473	362	440 c	458
8/27	0	0	0 c	0 c	0	0 c	0	0 c	0	0 c	0	0 c	114	201	582 c	361 c	523	445 c	172	349 c	473	362 c	440	458
8/28	0	0 c	0	0	0	0	0	0	0	0	0 c	0	114	201 c	582	361	523	445	172	349	473 c	362	440	458
8/29	0 c		0	0	0 c	0	0	0	0	0	0	0 c	114 c		582	361	523 c	445	172	349	473	362	440 c	
8/30	0		0		0	0	0	0	0	0 c												c		
8/31			0 c	c	0	0	0	0 c	0	0					c	c			c					
9/01		c	0		c				c				c	c			c				c		c	

"c" indicates days when commercial fishing periods occured in District 1

Appendix B.4. Historical daily percent passage of chinook salmon in the Bethel test fishery, 1985 - 1996.

Date	Percent Passage by Year												
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	Mean 85-96
6/01	0	0	0	0	0	0	0	0	1	1	0	0	0
6/02	0	0	0	1	0	0	0	0	1	1	1	0	0
6/03	0	0	0	1	0	0	0	0	4	2	1	1	1
6/04	0	1	0	1	0	1	0	0	4	2	1	1	1
6/05	0	2	1	1	0	1	1	0	6	6	2	2	2
6/06	0	3	1	1	0	1	2	0	8	10	2	2	3
6/07	0	5	2	2	0	2	6	0	9	10	4	3	4
6/08	0	5	5	8	2	3	7	1	11	12	8	4	5
6/09	0	6	7	12	3	4	7	3	17	13	8	4	7
6/10	0	6	10	14	6	6	7	5	20	13	10	8	9
6/11	0	6	13	20	7	9	9	11	21	13	13	8	11
6/12	0	6	17	25	9	12	9	17	25	15	17	14	14
6/13	0	6	19	28	11	13	10	23	28	20	20	16	16
6/14	0	6	23	29	16	14	11	29	30	34	22	17	19
6/15	0	11	25	31	20	16	12	32	35	38	23	19	22
6/16	0	21	26	33	21	18	13	38	39	42	24	24	25
6/17	0	28	36	39	25	20	15	45	46	45	26	31	30
6/18	0	30	38	41	32	23	22	47	53	46	32	37	33
6/19	0	37	40	44	35	28	25	49	59	52	39	47	38
6/20	1	38	44	51	38	30	34	51	65	56	41	55	42
6/21	7	47	48	56	41	33	37	54	71	61	47	65	47
6/22	7	54	53	59	44	37	40	54	78	69	50	72	51
6/23	9	61	57	64	49	39	43	56	80	73	55	77	55
6/24	9	68	59	70	53	45	46	60	85	73	60	78	59
6/25	13	68	65	72	58	52	51	63	86	76	65	82	63
6/26	13	71	69	75	67	59	53	66	87	77	74	85	66
6/27	15	75	73	79	77	62	54	69	88	80	76	88	70
6/28	23	75	76	80	79	68	58	72	89	81	77	88	72
6/29	30	76	79	81	79	73	67	75	90	85	82	88	75
6/30	34	78	81	82	83	73	72	77	93	87	85	89	78
7/01	44	81	83	85	86	73	77	80	94	88	88	89	81
7/02	45	84	85	85	86	75	82	82	94	89	89	89	82
7/03	53	87	86	87	88	79	86	84	95	90	91	90	85
7/04	59	89	87	88	89	83	89	87	96	91	93	91	87
7/05	67	90	88	90	91	85	90	88	96	92	94	91	89
7/06	74	91	90	90	92	86	91	88	96	94	94	93	90
7/07	77	92	92	90	93	88	92	88	96	97	95	94	91
7/08	81	94	92	90	94	91	93	89	97	97	96	94	92
7/09	86	95	92	90	95	92	93	89	98	98	98	94	93
7/10	87	95	93	90	96	92	94	90	98	98	98	95	94
7/11	89	96	93	90	96	92	94	91	99	98	98	97	94
7/12	90	96	94	90	96	93	94	92	99	98	98	97	95
7/13	92	96	94	90	96	93	95	93	99	98	98	97	95
7/14	92	97	94	92	96	94	96	93	99	98	98	97	96
7/15	93	97	94	92	96	94	97	93	99	98	98	97	96

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Appendix B.4. (page 2 of 2)

Date	Percent Passage by Year												
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	Mean 85-96
7/16	93	97	94	95	96	95	98	95	99	98	98	97	96
7/17	94	97	95	96	96	95	98	96	100	98	98	98	97
7/18	94	97	95	97	96	95	99	98	100	99	98	98	97
7/19	94	97	97	97	97	95	100	99	100	99	98	98	98
7/20	94	97	97	97	98	95	100	99	100	99	99	98	98
7/21	94	98	98	97	98	95	100	99	100	99	99	99	98
7/22	94	99	98	97	99	96	100	99	100	99	99	99	98
7/23	94	99	98	97	99	96	100	99	100	99	99	99	98
7/24	94	100	98	97	99	96	100	99	100	99	99	99	98
7/25	94	100	98	97	99	96	100	99	100	99	99	99	98
7/26	94	100	98	98	99	97	100	99	100	99	99	99	99
7/27	96	100	99	98	99	97	100	99	100	99	99	99	99
7/28	96	100	99	98	99	98	100	99	100	99	99	99	99
7/29	97	100	99	98	99	99	100	99	100	99	99	99	99
7/30	97	100	99	99	99	99	100	99	100	99	100	99	99
7/31	97	100	99	99	99	99	100	99	100	99	100	99	99
8/01	97	100	99	99	99	99	100	99	100	99	100	99	99
8/02	97	100	99	99	99	99	100	99	100	99	100	99	99
8/03	97	100	99	99	99	99	100	99	100	99	100	99	99
8/04	97	100	99	99	99	99	100	99	100	99	100	99	99
8/05	97	100	99	99	99	99	100	99	100	99	100	99	99
8/06	97	100	99	99	99	99	100	99	100	99	100	99	99
8/07	97	100	100	99	99	99	100	99	100	99	100	99	99
8/08	99	100	100	99	99	99	100	99	100	99	100	99	100
8/09	99	100	100	99	99	99	100	99	100	99	100	99	100
8/10	99	100	100	99	99	100	100	99	100	99	100	99	100
8/11	99	100	100	100	99	100	100	99	100	99	100	99	100
8/12	99	100	100	100	99	100	100	99	100	99	100	100	100
8/13	99	100	100	100	100	100	100	99	100	99	100	100	100
8/14	99	100	100	100	100	100	100	99	100	99	100	100	100
8/15	99	100	100	100	100	100	100	99	100	99	100	100	100
8/16	99	100	100	100	100	100	100	99	100	99	100	100	100
8/17	99	100	100	100	100	100	100	99	100	99	100	100	100
8/18	99	100	100	100	100	100	100	99	100	99	100	100	100
8/19	99	100	100	100	100	100	100	100	100	99	100	100	100
8/20	100	100	100	100	100	100	100	100	100	99	100	100	100
8/21	100	100	100	100	100	100	100	100	100	99	100	100	100
8/22	100	100	100	100	100	100	100	100	100	99	100	100	100
8/23	100	100	100	100	100	100	100	100	100	99	100	100	100
8/24	100	100	100	100	100	100	100	100	100	100	100	100	100
8/25	100	100	100	100	100	100	100	100	100	100	100	100	100
8/26	100	100	100	100	100	100	100	100	100	100	100	100	100
8/27	100	100	100	100	100	100	100	100	100	100	100	100	100
8/28	100	100	100	100	100	100	100	100	100	100	100	100	100
8/29	100	100	100	100	100	100	100	100	100	100	100	100	100

Appendix B... Historical daily and cumulative CPUE for sockeye salmon catches in the Bethel test fishery, 19.. 1996.

Date	Daily CPUE												Cumulative CPUE											
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
6/01	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0
6/02	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6/03	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6/04	0	0	6	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0
6/05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0
6/06	0	0	3	0	3	0	0	0	0	0	0	3	0	0	9	0	3	0	0	0	0	0	0	3
6/07	0	6	9	0	0	0	0	0	0	0	0	0	0	6	18	0	3	0	0	0	0	0	0	3
6/08	0	8	17	12	0	0	0	0	3	0	0	3	0	14	35	12	3	0	0	0	3	0	0	6
6/09	0	13	13	14	3	0	0	0	3	0	0	9	0	27	48	27	6	0	0	0	6	0	0	15
6/10	0	3	16	12	3	0	0	0	0	0	0	40	0	30	64	38	9	0	0	0	6	0	0	55
6/11	0	21	16	43	20	8	0	0	7	0	0	50	0	50	80	82	29	8	0	0	14	0	0	105
6/12	0	6	112	62	12	3	0	0	6	0	3	20	0	56	191	143	40	11	0	0	20	0	3	125
6/13	0	11	49	47	11	0	3	9	31	0	3	43	0	68	240	191	51	11	3	9	50	0	6	167
6/14	0	6	9	14	27	16	3	13	7	3	7	67	0	73	249	205	78	27	6	22	57	3	13	234
6/15	0	48	42	9	24	14	3	13	3	3	13	53	0	121	290	214	102	41	9	35	60	6	26	287
6/16	0	102	168	7 c	15	20	0	14	23	0	16	68	0	223	458	221 c	117	60	9	49	83	6	42	355
6/17	0	49	252	26	15	63	12	48	66	10	3	22 c	0	273	710	247	132	123	21	97	149	16	45	377 c
6/18	3	79	69 c	48	46	16	51	45 c	41	0	19	33	3	352	779 c	296	178	139	71	142 c	190	16	64	411
6/19	13	119	17	98	28 c	38	11	9	16	55	28	107	16	471	796	394	207 c	177	83	151	207	71	92	518
6/20	0 c	34	47	26 c	19	31 c	39 c	15	63	10	6	103 c	16 c	505	843	419 c	226	207 c	122 c	167	269	80	98	621 c
6/21	12	145	76	135	53	15	9	28	136	76	66	136	28	650	919	554	278	222	130	194	406	156	164	757
6/22	11	169	166	135	58	14	43	36 c	46	29	49 c	29	40	819	1,085	690	336	236	173	230 c	451	185	213 c	785
6/23	97	63	355	117	36 c	77	17	39	54	73	22	88	137	882	1,440	807	372 c	313	190	269	506	258	235	873
6/24	0 c	33	142 c	63 c	40	60	6 c	67	90	109 c	31	124 c	137 c	915	1,582 c	869 c	412	374	196 c	336	596	368 c	266	997 c
6/25	135	226	49	29	83	91 c	9	96 c	110 c	36	134	126	272	1,141	1,631	898	495	464 c	204	432 c	705 c	404	400	1,123
6/26	128	198 c	62	115	26 c	25	6	19	23	40	74 c	122	400	1,339 c	1,693	1,013	521 c	489	210	451	728	443	475 c	1,245
6/27	126 c	202	34	69	53	43	21	49	21	26	28	95	526 c	1,541	1,727	1,082	574	532	231	499	749	469	502	1,341
6/28	117	138	41	42 c	40	90	39	141	25	23	131	65	643	1,679	1,768	1,124 c	614	622	270	640	774	492	633	1,405
6/29	256	20	37	9	35	104 c	25	108 c	62	189	61 c	77	899	1,699	1,805	1,133	648	726 c	295	748 c	836	681	694 c	1,482
6/30	150	221 c	164 c	45	40 c	6	20	71	428	20	64	20	1,049	1,920 c	1,969 c	1,178	688 c	732	315	819	1,264	701	758	1,502
7/01	190 c	15	241	91	13	24	28 c	35	117	13	88	11	1,239 c	1,935	2,211	1,269	702	756	343 c	854	1,380	714	846	1,513
7/02	54	98	63	28 c	11	24	35	36	55	29	69	17 c	1,293	2,032	2,273	1,297 c	713	780	378	890	1,435	742	915	1,530 c
7/03	68	85 c	36 c	32	22 c	65	62	78	14	190	108 c	62	1,361	2,117 c	2,309 c	1,329	736 c	845	440	967	1,449	932	1,023 c	1,592
7/04	33 c	32	124	54	1	96	36	22	57	93	66	34	1,394 c	2,149	2,433	1,383	737	941	476	989	1,505	1,025	1,089	1,626
7/05	45	42	166	45 c	5 c	22 c	38	6	10	73	128	11 c	1,439	2,191	2,599	1,428 c	742 c	963 c	514	995	1,515	1,097	1,217	1,637 c
7/06	56	33	12	17	3	3	7 c	12 c	32	160	32 c	9	1,495	2,224	2,611	1,445	745	966	521 c	1,008 c	1,546	1,257	1,249 c	1,646
7/07	58	74 c	44 c	11	13	23	7	0	20	35	45	23	1,553	2,298 c	2,655 c	1,456	759	988	528	1,008	1,566	1,292	1,294	1,669
7/08	3	21	6	13 c	15 c	38	0	13	58	44	30	12 c	1,556	2,319	2,662	1,469 c	774 c	1,027	528	1,020	1,625	1,336	1,324	1,681 c
7/09	23	11	30	10	3	29 c	27	3	6	86	13	46	1,579	2,330	2,691	1,478	777	1,055 c	555	1,024	1,631	1,422	1,337	1,726
7/10	6	2 c	30	5	0	14	6	4	4	29	0 c	11	1,584	2,332 c	2,722	1,483	777	1,069	561	1,028	1,635	1,451	1,337 c	1,738
7/11	12	9	4 c	4 c	2 c	6	3	7	4	6	7	6	1,597	2,341	2,726 c	1,488 c	779 c	1,076	563	1,034	1,639	1,457	1,343	1,743
7/12	6	23	3	0	5	4	3	6	0	4	2	8 c	1,603	2,365	2,729	1,488	784	1,080	566	1,040	1,639	1,461	1,346	1,751 c
7/13	5	17	7	0	4	8	3 c	19	21	0	4	11	1,607	2,382	2,736	1,488	788	1,088	569 c	1,059	1,660	1,461	1,350	1,763
7/14	2	13	5	3 c	0 c	6 c	3	23	30	2 c	2 c	10	1,609	2,395	2,741	1,491 c	788 c	1,093 c	572	1,082	1,690	1,463 c	1,352 c	1,772
7/15	0	2	3 c	2	0	8	3	4	9	0	0	2	1,609	2,397	2,744 c	1,492	788	1,102	575	1,086	1,698	1,463	1,352	1,774
7/16	9	8	0	0	8	4	0	10	2	0	0	9 c	1,619	2,404	2,744	1,492	795	1,106	575	1,097	1,700	1,463	1,352	1,783 c
7/17	4	6	2	3	1	0	2	4	0	2	0	2	1,622	2,411	2,746	1,496	797	1,106	577	1,101	1,700	1,465	1,352	1,784
7/18	4	3	0	2 c	1 c	0	0 c	6	0	2	0 c	0	1,626	2,414	2,746	1,498 c	798 c	1,106	577 c	1,107	1,700	1,468	1,352 c	1,784

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Appendix B.5. (page 2 of 2)

Date	Daily CPUE												Cumulative CPUE											
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
7/19	3	4	6	0	1	2	0	0	0	0 c	0	0 c	1,629	2,416	2,752	1,498	799	1,108	577	1,107	1,700	1,468 c	1,352	1,784 c
7/20	5	4	3 c	0	0	0	0	0	0	0	4	2	1,635	2,421	2,755 c	1,498	799	1,108	577	1,107	1,700	1,468	1,357	1,786
7/21	5	7	0	0 c	0	0	0	0	2	1	0 c	0	1,639	2,428	2,755	1,498 c	799	1,108	577	1,107	1,703	1,469	1,357 c	1,786
7/22	8	3	0	1	0	0	2 c	0	2	2	0	4 c	1,648	2,431	2,755	1,499	799	1,108	579 c	1,107	1,705	1,471	1,357	1,790 c
7/23	3	3	0	0	0	0	2	0	0	0 c	2	0	1,651	2,434	2,755	1,499	799	1,108	581	1,107	1,705	1,471 c	1,359	1,790
7/24	0	0	0	1	0	0	0	0	0	2	0	0	1,651	2,434	2,755	1,500	799	1,108	581	1,107	1,705	1,473	1,359	1,790
7/25	0	0	0	0 c	0	0	0 c	0	0	0	0	2 c	1,651	2,434	2,755	1,500 c	799	1,108	581 c	1,107	1,705	1,473	1,359	1,792 c
7/26	2	0	0	0	0	0	0	0	0	0 c	0	2	1,653	2,434	2,755	1,500	799	1,108	581	1,107	1,705	1,473 c	1,359	1,794
7/27	0	1	0	0	0 c	0	0	0	0	0	0	0	1,653	2,435	2,755	1,500	799 c	1,108	581	1,107	1,705	1,473	1,359	1,794
7/28	0	0	0	0 c	0	2	0	0	0	0	2	0	1,653	2,435	2,755	1,500 c	799	1,109	581	1,107	1,705	1,473	1,361	1,794
7/29	0	2	0	0	0	0	0 c	0	0	0 c	0	0 c	1,653	2,437	2,755	1,500	799	1,109	581 c	1,107	1,705	1,473 c	1,361	1,794 c
7/30	0	2	0	0	0	1	0	0	0	0	0	0	1,653	2,439	2,755	1,500	799	1,111	581	1,107	1,705	1,473	1,361	1,794
7/31	0	0 c	0	1	0	2	0	0	0 c	0	0	0 c	1,653	2,439 c	2,755	1,501	799	1,113	581	1,107	1,705 c	1,473	1,361	1,794 c
8/01	0	1	0	0 c	0	0 c	0 c	0 c	0	0	2	0	1,653	2,441	2,755	1,501 c	799	1,113 c	581 c	1,107	1,705	1,473	1,363	1,794
8/02	0 c	0	2	0	0	0	0	0	0	0	0	0	1,653 c	2,441	2,757	1,501	799	1,113	581	1,107	1,705	1,473	1,363	1,794
8/03	2	0	2	0	0 c	0	0	0 c	0	0	2	0 c	1,654	2,441	2,759	1,501	799 c	1,113	581	1,107 c	1,705	1,473	1,365	1,794 c
8/04	0	0 c	0	0 c	0	0	0	0	0	0 c	0 c	0	1,654	2,441 c	2,759	1,501 c	799	1,113	581	1,107	1,705 c	1,473 c	1,365 c	1,794
8/05	0 c	0	0	0	0	0	0	0 c	0	0	0	0	1,654 c	2,441	2,759	1,501	799	1,113	581 c	1,107	1,705	1,473	1,365	1,794
8/06	0	1	0 c	0	0	2 c	0	0 c	0 c	0 c	0	0	1,654	2,442	2,759 c	1,501	799	1,114 c	581	1,107 c	1,705 c	1,473	1,365	1,794
8/07	0	0 c	0	0	0 c	0	0	0	0	0	2	0 c	1,654	2,442 c	2,759	1,501	799 c	1,114	581	1,107	1,705	1,473	1,367	1,794 c
8/08	0 c	0	0	0 c	0	0	0 c	0	0	0	0 c	0	1,654 c	2,442	2,759	1,501 c	799	1,114	581 c	1,107	1,705	1,473	1,367 c	1,794
8/09	0	0	0	0	0 c	0	0	0	0 c	0 c	0	0	1,654	2,442	2,759	1,501	799 c	1,114	581	1,107	1,705 c	1,473 c	1,367	1,794
8/10	0	3	0	0 c	0	0 c	0	0	0	2	0	0 c	1,654	2,444	2,759	1,501 c	799	1,114 c	581	1,107	1,705	1,475	1,367	1,794 c
8/11	0	0 c	0	0	0	0	0	0	0 c	0	0	0	1,654	2,444 c	2,759	1,501	799	1,114	581	1,107 c	1,705	1,475	1,367	1,794
8/12	0 c	0	2	0 c	0 c	0	0 c	0 c	2	0	0 c	0 c	1,654 c	2,444	2,761	1,501 c	799 c	1,114	581 c	1,109	1,705	1,475 c	1,367 c	1,794
8/13	0	0 c	0 c	0	0	0 c	0	0	0	0	0	0 c	1,654	2,444 c	2,761 c	1,501	799	1,114 c	581	1,109	1,705	1,475	1,367	1,794 c
8/14	0	0	0	0	0	0	0	0 c	0 c	0 c	0	0	1,654	2,444	2,761	1,501	799	1,114	581 c	1,109 c	1,705 c	1,475	1,367	1,794
8/15	0 c	0 c	0	0 c	0 c	0	0	0	0	0	0 c	0	1,654 c	2,444 c	2,761	1,501 c	799 c	1,114	581	1,109	1,705	1,475 c	1,367	1,794
8/16	0	0	0	0	0	0	0 c	0	0	0	0 c	0 c	1,654	2,444	2,761	1,501	799	1,114 c	581	1,109	1,705	1,475	1,367 c	1,794 c
8/17	0	0	0 c	0	0	0	0	0	0 c	0 c	0	0	1,654	2,444	2,761 c	1,501	799	1,114	581	1,109 c	1,705 c	1,475	1,367	1,794
8/18	0	0 c	0	0 c	0 c	0	0	0	0	0	0	0	1,654	2,444 c	2,761	1,501 c	799 c	1,114	581	1,109	1,705	1,475 c	1,367	1,794
8/19	0 c	0	0 c	0	0	0	0 c	0	0	0	0 c	0	1,654 c	2,444	2,761 c	1,501	799	1,114	581 c	1,109	1,705	1,475	1,367 c	1,794
8/20	0	0	0	0 c	0	0 c	0	0 c	0	0 c	0	0 c	1,654	2,444	2,761	1,501 c	799	1,114 c	581	1,109 c	1,705	1,475	1,367	1,794 c
8/21	0	0 c	0 c	0	0	0	0	0	0	0 c	0	0	1,654	2,444 c	2,761 c	1,501	799	1,114	581	1,109	1,705 c	1,475	1,367	1,794
8/22	0 c	0	0	0	0	0	0	0	0	0	0 c	0	1,654 c	2,444	2,761	1,501	799	1,114	581	1,109	1,705	1,475 c	1,367 c	1,794
8/23	0	0	0	0	0 c	0	0	0	0	0	0	0 c	1,654	2,444	2,761	1,501	799 c	1,114	581	1,109	1,705	1,475	1,367	1,794 c
8/24	0	1	1 c	0	0	0	0	0 c	0	0	0	0	1,654	2,445	2,762 c	1,501	799	1,114	581	1,109 c	1,705	1,475	1,367	1,794
8/25	0	0 c	0	0	0	0	0	0	0	0 c	0 c	0	1,654	2,445 c	2,762	1,501	799	1,114	581	1,109	1,705 c	1,475 c	1,367	1,794
8/26	0 c	0	0	0	0 c	0	0 c	0	0	0	0 c	0	1,654 c	2,445	2,762	1,501	799 c	1,114	581 c	1,109	1,705	1,475	1,367 c	1,794
8/27	0	0	0 c	0 c	0	0 c	0	0 c	0	0 c	0	0	1,654	2,445	2,762 c	1,501 c	799	1,114 c	581	1,109 c	1,705	1,475 c	1,367	1,794
8/28	0	0 c	0	0	0	0	0	0	0	0 c	0	0	1,654	2,445 c	2,762	1,501	799	1,114	581	1,109	1,705 c	1,475	1,367	1,794
8/29	0 c		0	0	0 c	0	0	0	0	0	0 c		1,654 c		2,762	1,501	799 c	1,114	581	1,109	1,705	1,475	1,367 c	
8/30	0		0		0	0	0	0	0	0 c			1,654		2,762		799	1,114	581	1,109	1,705	1,475 c		
8/31			1/0 c	c	0	0	0	0 c	0	0					2,762 c	c	799	1,114	581	1,109 c	1,705	1,475		
9/01		c	1/0	c					c		c				c	2,762	c				c		c	

"c" indicates days when commercial fishing periods occured in District 1

Appendix B.6. Historical daily percent passage of sockeye salmon in the Bethel test fishery, 1985 - 1996.

Date	Percent Passage by Year												
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	Mean 85-96
6/01	0	0	0	0	0	0	0	0	0	0	0	0	0
6/02	0	0	0	0	0	0	0	0	0	0	0	0	0
6/03	0	0	0	0	0	0	0	0	0	0	0	0	0
6/04	0	0	0	0	0	0	0	0	0	0	0	0	0
6/05	0	0	0	0	0	0	0	0	0	0	0	0	0
6/06	0	0	0	0	0	0	0	0	0	0	0	0	0
6/07	0	0	1	0	0	0	0	0	0	0	0	0	0
6/08	0	1	1	1	0	0	0	0	0	0	0	0	0
6/09	0	1	2	2	1	0	0	0	0	0	0	0	1
6/10	0	1	2	3	1	0	0	0	0	0	0	0	1
6/11	0	2	3	5	4	1	0	0	1	0	0	1	1
6/12	0	2	7	10	5	1	0	0	1	0	0	1	2
6/13	0	3	9	13	6	1	0	1	3	0	0	1	3
6/14	0	3	9	14	10	2	1	2	3	0	1	2	4
6/15	0	5	11	14	13	4	1	3	4	0	2	3	5
6/16	0	9	17	15	15	5	1	4	5	0	3	7	7
6/17	0	11	26	16	17	11	4	9	9	1	3	8	9
6/18	0	14	28	20	22	12	12	13	11	1	5	12	13
6/19	1	19	29	26	26	16	14	14	12	5	7	14	15
6/20	1	21	31	28	28	19	21	15	16	5	7	18	17
6/21	2	27	33	37	35	20	22	18	24	11	12	30	22
6/22	2	33	39	46	42	21	30	21	26	13	16	41	28
6/23	8	36	52	54	47	28	33	24	30	18	17	42	32
6/24	8	37	57	58	52	34	34	30	35	25	19	43	36
6/25	16	47	59	60	62	42	35	39	41	27	29	49	42
6/26	24	55	61	68	65	44	36	41	43	30	35	53	46
6/27	32	63	63	72	72	48	40	45	44	32	37	57	50
6/28	39	69	64	75	77	56	46	58	45	33	46	57	55
6/29	54	69	65	76	81	65	51	67	49	46	51	70	62
6/30	63	79	71	78	86	66	54	74	74	47	55	73	68
7/01	75	79	80	85	88	68	59	77	81	48	62	76	73
7/02	78	83	82	86	89	70	65	80	84	50	67	79	76
7/03	82	87	84	89	92	76	76	87	85	63	75	80	81
7/04	84	88	88	92	92	84	82	89	88	69	80	81	85
7/05	87	90	94	95	93	86	89	90	89	74	89	83	88
7/06	90	91	95	96	93	87	90	91	91	85	91	84	90
7/07	94	94	96	97	95	89	91	91	92	88	95	88	92
7/08	94	95	96	98	97	92	91	92	95	91	97	91	94
7/09	95	95	97	99	97	95	96	92	96	96	98	92	96
7/10	96	95	99	99	97	96	97	93	96	98	98	94	96
7/11	97	96	99	99	98	97	97	93	96	99	98	96	97
7/12	97	97	99	99	98	97	98	94	96	99	98	96	97
7/13	97	97	99	99	99	98	98	95	97	99	99	96	98
7/14	97	98	99	99	99	98	99	98	99	99	99	96	98
7/15	97	98	99	99	99	99	99	98	100	99	99	97	99

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Appendix B.6. (page 2 of 2)

Date	Percent Passage by Year												
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	Mean 85-96
7/16	98	98	99	99	100	99	99	99	100	99	99	97	99
7/17	98	99	99	100	100	99	99	99	100	99	99	97	99
7/18	98	99	99	100	100	99	99	100	100	99	99	97	99
7/19	98	99	100	100	100	99	99	100	100	99	99	98	99
7/20	99	99	100	100	100	99	99	100	100	99	99	98	99
7/21	99	99	100	100	100	99	99	100	100	100	99	99	99
7/22	100	99	100	100	100	99	100	100	100	100	99	99	100
7/23	100	100	100	100	100	99	100	100	100	100	99	99	100
7/24	100	100	100	100	100	99	100	100	100	100	99	99	100
7/25	100	100	100	100	100	99	100	100	100	100	99	99	100
7/26	100	100	100	100	100	99	100	100	100	100	99	99	100
7/27	100	100	100	100	100	99	100	100	100	100	99	99	100
7/28	100	100	100	100	100	100	100	100	100	100	100	99	100
7/29	100	100	100	100	100	100	100	100	100	100	100	99	100
7/30	100	100	100	100	100	100	100	100	100	100	100	100	100
7/31	100	100	100	100	100	100	100	100	100	100	100	100	100
8/01	100	100	100	100	100	100	100	100	100	100	100	100	100
8/02	100	100	100	100	100	100	100	100	100	100	100	100	100
8/03	100	100	100	100	100	100	100	100	100	100	100	100	100
8/04	100	100	100	100	100	100	100	100	100	100	100	100	100
8/05	100	100	100	100	100	100	100	100	100	100	100	100	100
8/06	100	100	100	100	100	100	100	100	100	100	100	100	100
8/07	100	100	100	100	100	100	100	100	100	100	100	100	100
8/08	100	100	100	100	100	100	100	100	100	100	100	100	100
8/09	100	100	100	100	100	100	100	100	100	100	100	100	100
8/10	100	100	100	100	100	100	100	100	100	100	100	100	100
8/11	100	100	100	100	100	100	100	100	100	100	100	100	100
8/12	100	100	100	100	100	100	100	100	100	100	100	100	100
8/13	100	100	100	100	100	100	100	100	100	100	100	100	100
8/14	100	100	100	100	100	100	100	100	100	100	100	100	100
8/15	100	100	100	100	100	100	100	100	100	100	100	100	100
8/16	100	100	100	100	100	100	100	100	100	100	100	100	100
8/17	100	100	100	100	100	100	100	100	100	100	100	100	100
8/18	100	100	100	100	100	100	100	100	100	100	100	100	100
8/19	100	100	100	100	100	100	100	100	100	100	100	100	100
8/20	100	100	100	100	100	100	100	100	100	100	100	100	100
8/21	100	100	100	100	100	100	100	100	100	100	100	100	100
8/22	100	100	100	100	100	100	100	100	100	100	100	100	100
8/23	100	100	100	100	100	100	100	100	100	100	100	100	100
8/24	100	100	100	100	100	100	100	100	100	100	100	100	100
8/25	100	100	100	100	100	100	100	100	100	100	100	100	100
8/26	100	100	100	100	100	100	100	100	100	100	100	100	100
8/27	100	100	100	100	100	100	100	100	100	100	100	100	100
8/28	100	100	100	100	100	100	100	100	100	100	100	100	100
8/29	100	100	100	100	100	100	100	100	100	100	100	100	100

Appendix B.7. Historical daily and cumulative CPUE for chum salmon catches in the Bethel test fishery, 1985 - 1996.

Date	Daily												Cumulative											
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
6/01	0	0	0	0	3	0		0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0
6/02	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	3	0	0	0	0	10	0	0
6/03	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	3	0	0	0	0	18	0	0
6/04	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	3	0	0	0	0	21	0	0
6/05	0	6	3	9	3	0	0	0	0	0	0	15	0	6	3	9	6	0	0	0	0	21	0	15
6/06	0	10	12	0	0	3	0	7	3	7	0	29	0	16	16	9	6	3	0	7	3	28	0	45
6/07	0	0	6	3	6	0	0	3	0	3	0	12	0	16	22	12	11	3	0	10	3	31	0	56
6/08	0	8	9	11	10	0	0	3	0	0	0	23	0	24	30	23	22	3	0	13	3	31	0	80
6/09	0	28	15	38	9	0	0	3	0	10	0	35	0	53	45	61	30	3	0	16	3	41	0	115
6/10	0	6	6	29	12	0	0	6	6	0	0	54	0	59	52	90	42	3	0	22	9	41	0	169
6/11	0	9	21	63	3	0	0	12	8	3	6	67	0	68	72	153	45	3	0	34	17	44	6	237
6/12	0	9	13	91	17	3	3	9	0	13	0	65	0	77	86	244	62	6	3	43	17	57	6	301
6/13	3	0	19	87	20	0	0	44	9	28	3	175	3	77	105	331	82	6	3	87	27	86	10	476
6/14	0	9	3	19	7	13	6	21	7	56	6	321	3	86	108	350	90	18	9	108	33	142	16	797
6/15	3	38	10	45	36	0	0	105	13	143	26	204	5	124	117	395	126	18	9	212	46	285	42	1,001
6/16	3	46	42	26 c	24	3	0	116	3	59	48	168	8	170	159	421 c	150	21	9	328	49	343	90	1,170
6/17	8	121	122	56	4	22	0	55	10	52	51	171 c	16	290	281	477	154	43	9	383	59	395	141	1,340
6/18	8	108	41 c	195	49	20	0	43 c	35	20	63	187	25	398	322 c	671	203	63	9	426 c	93	416	204	1,527
6/19	65	151	6	160	68 c	28	0	0	0	263	36	594	90	549	328	832	271 c	91	9	426	93	678	240	2,121
6/20	115 c	64	60	50 c	44	9 c	25 c	33	11	26	80	742 c	205 c	613	388	881 c	315	100 c	34 c	460	105	705	320	2,864 c
6/21	3	87	24	143	76	30	3	58	44	278	153	820	207	700	412	1,025	391	130	37	518	149	983	473	3,684
6/22	25	104	200	251	56	22	9	49 c	95	125	94 c	357	232	804	613	1,276	446	152	46	567 c	244	1,107	567	c 4,041
6/23	28	203	103	246	79 c	53	14	53	65	190	111	498	260	1,007	715	1,522	525 c	205	60	620	310	1,297	678	4,539
6/24	3 c	112	48 c	86 c	167	77	6 c	29	126	112 c	51	665 c	263 c	1,119	763 c	1,608 c	692	282	66 c	649	436	1,408 c	729	5,204
6/25	52	460	66	16	208	32 c	9	39 c	107 c	10	219	513	315	1,579	829	1,624	900	314 c	74	688 c	543	c 1,419	948	5,717 c
6/26	65	177 c	100	63	111 c	49	32	43	0	17	157 c	325	380	1,756 c	928	1,687	1,011 c	363	106	732	543	1,435	1,105	c 6,042
6/27	58 c	109	87	306	134	168	58	212	7	16	25	90	438 c	1,865	1,015	1,993	1,145	531	163	943	550	1,451	1,130	6,132
6/28	24	35	105	109 c	78	72	50	107	13	7	59	80	463	1,901	1,120	2,101 c	1,223	603	213	1,050	563	1,458	1,190	6,211
6/29	180	6	268	108	122	87 c	64	130 c	30	111	146 c	93	643	1,907	1,389	2,210	1,345	690 c	277	1,180 c	594	1,569	1,335	c 6,305 c
6/30	177	105 c	246 c	88	106 c	32	8	136	153	7	111	63	820	2,012 c	1,635 c	2,298	1,452 c	722	285	1,316	746	1,575	1,447	6,368
7/01	77 c	3	152	382	115	67	30 c	124	120	10	164	92	896 c	2,015	1,787	2,680	1,567	789	315 c	1,440	866	1,585	1,610	6,459
7/02	31	70	120	188 c	66	28	91	43	19	19	144	114 c	928	2,085	1,906	2,868 c	1,633	817	406	1,483	885	1,604	1,755	6,573
7/03	24	193 c	34 c	437	78 c	200	22	267	125	192	291 c	67	952	2,277 c	1,941 c	3,306	1,711 c	1,017	427	1,750	1,010	1,796	2,045	c 6,641
7/04	5 c	123	62	469	57	214	33	322	82	141	168	112	957 c	2,401	2,003	3,775	1,768	1,231	461	2,072	1,092	1,937	2,213	6,753
7/05	40	309	177	192 c	182 c	188 c	6	189	78	88	214	149 c	997	2,709	2,180	3,966 c	1,950 c	1,419 c	466	2,261	1,170	2,025	2,427	6,902 c
7/06	25	140	389	120	59	26	12 c	105 c	39	383	58 c	128	1,022	2,850	2,569	4,086	2,009	1,445	478	c 2,366	c 1,209	2,408	2,485	c 7,029
7/07	93	62 c	463 c	27	117	173	12	13	24	245	274	41	1,115	2,912 c	3,032 c	4,114	2,126	1,618	490	2,379	1,233	2,653	2,759	7,070
7/08	3	68	38	34 c	65 c	136	9	139	71	732	271	23 c	1,118	2,979	3,070	4,148 c	2,190 c	1,754	499	2,518	1,304	3,385	3,029	7,093
7/09	5	246	272	92	57	61 c	60	48	31	394	219	32	1,123	3,225	3,342	4,240	2,247	1,815 c	559	2,567	1,335	3,779	3,248	7,125 c
7/10	0	34 c	208	148	66	81	46	46	28	253	27 c	133	1,123	3,260 c	3,550	4,388	2,314	1,896	605	2,613	1,363	4,031	3,275	c 7,258
7/11	0	87	63 c	83 c	3 c	78	26	48	37	69	98	31	1,123	3,347	3,612 c	4,471 c	2,317 c	1,975	631	2,661	1,400	4,100	3,373	7,289
7/12	3	163	53	65	7	74	43	59	62	33	73	37 c	1,126	3,510	3,665	4,536	2,324	2,048	674	2,719	1,461	4,133	3,446	7,326
7/13	10	134	87	63	55	23	21 c	51	270	108	49	82	1,137	3,644	3,752	4,599	2,379	2,071	695	c 2,770	1,731	4,241	3,495	7,408
7/14	0	25	255	38 c	35 c	33 c	28	49	67	57 c	66 c	52	1,137	3,669	4,007	4,637 c	2,414 c	2,104 c	723	2,820	1,798	4,298	c 3,561	c 7,459 c
7/15	0	10	61 c	69	11	24	20	27	140	38	30	121	1,137	3,679	4,068 c	4,706	2,424	2,128	743	2,846	1,938	4,336	3,591	7,581
7/16	6	16	33	82	20	37	12	21	88	32	17	113 c	1,142	3,696	4,101	4,788	2,445	2,165	755	2,867	2,026	4,368	3,608	7,694
7/17	32	43	107	64	17	24	16	23	75	15	15	81	1,174	3,739	4,208	4,852	2,462	2,190	770	2,890	2,101	4,383	3,623	7,775
7/18	9	43	125	57 c	23 c	59	51 c	25	53	48	21 c	42	1,183	3,782	4,333	4,909 c	2,485 c	2,249	821	c 2,915	2,154	4,431	3,645	c 7,817

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Appendix B.7. (page 2 of 2)

Date	Daily												Cumulative											
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
7/19	19	50	202	16	16	66	16	29	94	26 c	8	96 c	1,202	3,831	4,535	4,925	2,501	2,315	837	2,944	2,248	4,457 c	3,653	7,913
7/20	7	36	170 c	29	29	73	16	4	52	9	38	52	1,209	3,867	4,706 c	4,954	2,530	2,388	853	2,948	2,299	4,465	3,690	7,965
7/21	5	52	23	36 c	13	57	40	3	51	0	35 c	57	1,214	3,919	4,729	4,990 c	2,543	2,445	894	2,952	2,350	4,465	3,725 c	8,022
7/22	12	34	12	10	7	40	57 c	0	134	82	42	68 c	1,225	3,953	4,740	4,999	2,551	2,485	951	c 2,952	2,484	4,547	3,767	8,090
7/23	6	26	8	6	13	35	33	23	28	38 c	43	19	1,231	3,979	4,748	5,005	2,564	2,520	983	2,975	2,512	4,585 c	3,810	8,109
7/24	2	29	28	24	0	24	12	6	9	55	27	42	1,233	4,008	4,776	5,030	2,564	2,544	995	2,981	2,521	4,641	3,837	8,151
7/25	9	11	41	15 c	4	8	56 c	10	0	26	16	25 c	1,243	4,019	4,817	5,045 c	2,568	2,552	1,051	c 2,991	2,521	4,666	3,853	8,176
7/26	6	2	20	13	0	2	8	7	2	9 c	27	24	1,249	4,021	4,837	5,058	2,568	2,554	1,059	2,999	2,523	4,675 c	3,879	8,200
7/27	2	3	4	18	0 c	18	49	8	7	9	17	19	1,251	4,023	4,841	5,076	2,568 c	2,572	1,108	3,006	2,530	4,684	3,897	8,219
7/28	4	7	6	10 c	0	35	18	9	4	18	24	6	1,255	4,031	4,847	5,085 c	2,568	2,607	1,126	3,015	2,534	4,702	3,920	8,224
7/29	10	11	5	13	1	36	36 c	4	5	11 c	9	8 c	1,265	4,042	4,852	5,098	2,570	2,643	1,162	c 3,019	2,539	4,712 c	3,929	8,232
7/30	4	5	2	23	0	9	14	6	2	5	2	11	1,269	4,047	4,854	5,120	2,570	2,651	1,175	3,025	2,541	4,719	3,931	8,243
7/31	1	0 c	1	6	14	2	24	0	6 c	14	10	2 c	1,270	4,047 c	4,856	5,126	2,584	2,653	1,199	3,025	2,547 c	4,732	3,942	8,244
8/01	0	5	4	5 c	6	6 c	8 c	0	5	16	8	4	1,270	4,051	4,860	5,131 c	2,590	2,659 c	1,207 c	3,025	2,552	4,748	3,950	8,248 c
8/02	1 c	0	3	4	8	6	6	15	7	10	2	5	1,271 c	4,051	4,863	5,135	2,598	2,665	1,213	3,040	2,558	4,759	3,952	8,253
8/03	2	4	9	6	4 c	6	12	2 c	2	2	12	0 c	1,272	4,055	4,872	5,142	2,602 c	2,671	1,224	3,042 c	2,561	4,761	3,964	8,253
8/04	8	0 c	11	3 c	1	2	10	0	11 c	2 c	6 c	0	1,281	4,055 c	4,884	5,145 c	2,603	2,672	1,234	3,042	2,571 c	4,763 c	3,970 c	8,253
8/05	0 c	0	3	3	0	1	0 c	0	9	2	2	0	1,281 c	4,055	4,887	5,148	2,603	2,673	1,234	c 3,042	2,581	4,765	3,972	8,253
8/06	4	3	4 c	7	3	23 c	2	4 c	2 c	0	4	0	1,285	4,058	4,891	c 5,155	2,606	2,697 c	1,236	3,046 c	2,583 c	4,765	3,977	8,253 c
8/07	6	1 c	0	19	2 c	8	2	0	0	4	4	0 c	1,290	4,059	c 4,891	5,174	2,608 c	2,703	1,238	3,046	2,583	4,769	3,981	8,253
8/08	0 c	0	0	3 c	0	0	5 c	0	0	9	0 c	0	1,290 c	4,059	4,891	5,177 c	2,608	2,703	1,243	c 3,046	2,583	4,778	3,981 c	8,253
8/09	0	2	2	3	2 c	4	2	4	0 c	7 c	0	0	1,290	4,062	4,893	5,180	2,610 c	2,707	1,245	3,050	2,583 c	4,785 c	3,981	8,253
8/10	36	0	2	4 c	0	2 c	3	0	0	2	0	2 c	1,326	4,062	4,895	5,184 c	2,610	2,708 c	1,248	3,050	2,583	4,787	3,981	8,255 c
8/11	1	0 c	0	3	0	2	4	2 c	0	4	2	0	1,327	4,062 c	4,895	5,187	2,610	2,710	1,252	3,052 c	2,583	4,791	3,983	8,255
8/12	0 c	0	0	2 c	0 c	4	3 c	6	0	2 c	0 c	0	1,327 c	4,062	4,895	5,189 c	2,610 c	2,714	1,255 c	3,058	2,583	4,793 c	3,983 c	8,255
8/13	0	0 c	0 c	0	0	0 c	2	0	0	0	0	0 c	1,327	4,062 c	4,895 c	5,189	2,610	2,714 c	1,257	3,058	2,583	4,793	3,983	8,255 c
8/14	0	2	0	0	0	0	0 c	0 c	0	0 c	2	0	1,327	4,063	4,895	5,189	2,610	2,714	1,257	c 3,058	c 2,583	c 4,793	3,985	8,255
8/15	0 c	2 c	4	0 c	0 c	2	2	0	0	0 c	0	0	1,327 c	4,066 c	4,899	5,189 c	2,610 c	2,716	1,258	3,058	2,583	4,793 c	3,985	8,255
8/16	0	0	1	0	0	2 c	0	0	0	2	0 c	0 c	1,327	4,066	4,900	5,189	2,610	2,718 c	1,258	3,058	2,583	4,795	3,985 c	8,255 c
8/17	0	0	0 c	0	0	0	2	0 c	0 c	0	0	0	1,327	4,066	4,900 c	5,189	2,610	2,718	1,260	3,058 c	2,583 c	4,795	3,985	8,255
8/18	0	0 c	0	0 c	0 c	0	2	0	0	2 c	0	0	1,327	4,066 c	4,900	5,189 c	2,610 c	2,718	1,262	3,058	2,583	4,797 c	3,985	8,255
8/19	0 c	0	0 c	0	0	0	0 c	0	2	0	0 c	0	1,327 c	4,066	4,900 c	5,189	2,610	2,718	1,262	c 3,058	2,585	4,797	3,985 c	8,255
8/20	0	0	0	0 c	0	0 c	0	0 c	0	0	0	0 c	1,327	4,066	4,900	5,189 c	2,610	2,718 c	1,262	3,058 c	2,585	4,797	3,985	8,255 c
8/21	0	0 c	0 c	0	0	0	0	0	0	0 c	0	0	1,327	4,066 c	4,900 c	5,189	2,610	2,718	1,262	3,058	2,585 c	4,797	3,985	8,255
8/22	0 c	0	0	0	0	0	2	0	0	0	0 c	2 c	1,327 c	4,068	4,900	5,189	2,610	2,720	1,262	3,058	2,585	4,797 c	3,987 c	8,255
8/23	0	0	0	0	0 c	0	0	0	0	0	0	0 c	1,327	4,066	4,900	5,189	2,610 c	2,720	1,262	3,058	2,585	4,797	3,987	8,255
8/24	0	0	0 c	0	0	0	0	0	0 c	0	0	0	1,327	4,066	4,900 c	5,189	2,610	2,720	1,262	3,058 c	2,585	4,797	3,987	8,255
8/25	0	0 c	0	0	0	0	0	0	0 c	0 c	0	0	1,327	4,066 c	4,900	5,189	2,610	2,720	1,262	3,058	2,585 c	4,797 c	3,987	8,255
8/26	0 c	0	0	0	0 c	0	0 c	0	0	0	0 c	0	1,327 c	4,066	4,900	5,189	2,610 c	2,720	1,262 c	3,058	2,585	4,797	3,987 c	8,255
8/27	0	0	0 c	0 c	0	2 c	0	0 c	0	0 c	0	0	1,327	4,066	4,900 c	5,189 c	2,610	2,722 c	1,262	3,058 c	2,585	4,797 c	3,987	8,255 c
8/28	0	0 c	0	0	0	0	0	0	0 c	0	0	0	1,327	4,066 c	4,900	5,189	2,610	2,722	1,262	3,058	2,585 c	4,797	3,987	8,255
8/29	0 c		0	0	0 c	0	0	0	2	0	0 c		1,327 c		4,900	5,189	2,610 c	2,722	1,262	3,058	2,587	4,797	3,987 c	
8/30	0		0		0	0	0	0	0	0 c			1,327		4,900		2,610	2,722	1,262	3,058	2,587	4,797 c		
8/31			0 c	c	0	0	0	0 c	0						4,900 c		c 2,610	2,722	1,262	3,058	c 2,587			
9/01		c	0		c				c		c				c 4,900		c					c		c

"c" indicates days when commercial fishing periods occured in District 1.

Appendix B.8. Historical daily percent passage of chum salmon in the Bethel test fishery, 1985 - 1996.

Date	Percent Passage by Year												
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	Mean 85-96
6/01	0	0	0	0	0	0	0	0	0	0	0	0	0
6/02	0	0	0	0	0	0	0	0	0	0	0	0	0
6/03	0	0	0	0	0	0	0	0	0	0	0	0	0
6/04	0	0	0	0	0	0	0	0	0	0	0	0	0
6/05	0	0	0	0	0	0	0	0	0	0	0	0	0
6/06	0	0	0	0	0	0	0	0	0	1	0	1	0
6/07	0	0	0	0	0	0	0	0	0	1	0	1	0
6/08	0	1	1	0	1	0	0	0	0	1	0	1	0
6/09	0	1	1	1	1	0	0	1	0	1	0	1	1
6/10	0	1	1	2	2	0	0	1	0	1	0	2	1
6/11	0	2	1	3	2	0	0	1	1	1	0	3	1
6/12	0	2	2	5	2	0	0	1	1	1	0	4	2
6/13	0	2	2	6	3	0	0	3	1	2	0	6	2
6/14	0	2	2	7	3	1	1	4	1	3	0	10	3
6/15	0	3	2	8	5	1	1	7	2	6	1	12	4
6/16	1	4	3	8	6	1	1	11	2	7	2	14	5
6/17	1	7	6	9	6	2	1	13	2	8	4	16	6
6/18	2	10	7	13	8	2	1	14	4	9	5	18	8
6/19	7	14	7	16	10	3	1	14	4	14	6	26	10
6/20	15	15	8	17	12	4	3	15	4	15	8	35	13
6/21	16	17	8	20	15	5	3	17	6	20	12	45	15
6/22	17	20	13	25	17	6	4	19	9	23	14	49	18
6/23	20	25	15	29	20	8	5	20	12	27	17	55	21
6/24	20	28	16	31	27	10	5	21	17	29	18	63	24
6/25	24	39	17	31	34	12	6	23	21	30	24	69	27
6/26	29	43	19	33	39	13	8	24	21	30	28	73	30
6/27	33	46	21	38	44	20	13	31	21	30	28	74	33
6/28	35	47	23	40	47	22	17	34	22	30	30	75	35
6/29	48	47	28	43	52	25	22	39	23	33	33	76	39
6/30	62	49	33	44	56	27	23	43	29	33	36	77	43
7/01	68	50	36	52	60	29	25	47	33	33	40	78	46
7/02	70	51	39	55	63	30	32	48	34	33	44	80	48
7/03	72	56	40	64	66	37	34	57	39	37	51	80	53
7/04	72	59	41	73	68	45	36	68	42	40	56	82	57
7/05	75	67	44	76	75	52	37	74	45	42	61	84	61
7/06	77	70	52	79	77	53	38	77	47	50	62	85	64
7/07	84	72	62	79	81	59	39	78	48	55	69	86	68
7/08	84	73	63	80	84	64	40	82	50	71	76	86	71
7/09	85	79	68	82	86	67	44	84	52	79	81	86	74
7/10	85	80	72	85	89	70	48	85	53	84	82	88	77
7/11	85	82	74	86	89	73	50	87	54	85	85	88	78
7/12	85	86	75	87	89	75	53	89	57	86	86	89	80
7/13	86	90	77	89	91	76	55	91	67	88	88	90	82
7/14	86	90	82	89	92	77	57	92	70	90	89	90	84
7/15	86	90	83	91	93	78	59	93	75	90	90	92	85

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Appendix B.8. (page 2 of 2)

Date	Percent Passage by Year												
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	Mean 85-96
7/16	86	91	84	92	94	80	60	94	78	91	90	93	86
7/17	88	92	86	94	94	81	61	95	81	91	91	94	87
7/18	89	93	88	95	95	83	65	95	83	92	91	95	89
7/19	91	94	93	95	96	85	66	96	87	93	92	96	90
7/20	91	95	96	95	97	88	68	96	89	93	93	96	91
7/21	91	96	97	96	97	90	71	97	91	93	93	97	92
7/22	92	97	97	96	98	91	75	97	96	95	94	98	94
7/23	93	98	97	96	98	93	78	97	97	96	96	98	95
7/24	93	99	97	97	98	94	79	97	98	97	96	99	95
7/25	94	99	98	97	98	94	83	98	98	97	97	99	96
7/26	94	99	99	97	98	94	84	98	98	97	97	99	96
7/27	94	99	99	98	98	95	88	98	98	98	98	100	97
7/28	95	99	99	98	98	96	89	99	98	98	98	100	97
7/29	95	99	99	98	98	97	92	99	98	98	99	100	98
7/30	96	100	99	99	98	97	93	99	98	98	99	100	98
7/31	96	100	99	99	99	98	95	99	99	99	99	100	98
8/01	96	100	99	99	99	98	96	99	99	99	99	100	98
8/02	96	100	99	99	100	98	96	99	99	99	99	100	99
8/03	96	100	99	99	100	98	97	99	99	99	99	100	99
8/04	96	100	100	99	100	98	98	99	99	99	100	100	99
8/05	96	100	100	99	100	98	98	99	100	99	100	100	99
8/06	97	100	100	99	100	99	98	100	100	99	100	100	99
8/07	97	100	100	100	100	99	98	100	100	99	100	100	99
8/08	97	100	100	100	100	99	98	100	100	100	100	100	99
8/09	97	100	100	100	100	100	99	100	100	100	100	100	100
8/10	100	100	100	100	100	100	99	100	100	100	100	100	100
8/11	100	100	100	100	100	100	99	100	100	100	100	100	100
8/12	100	100	100	100	100	100	99	100	100	100	100	100	100
8/13	100	100	100	100	100	100	100	100	100	100	100	100	100
8/14	100	100	100	100	100	100	100	100	100	100	100	100	100
8/15	100	100	100	100	100	100	100	100	100	100	100	100	100
8/16	100	100	100	100	100	100	100	100	100	100	100	100	100
8/17	100	100	100	100	100	100	100	100	100	100	100	100	100
8/18	100	100	100	100	100	100	100	100	100	100	100	100	100
8/19	100	100	100	100	100	100	100	100	100	100	100	100	100
8/20	100	100	100	100	100	100	100	100	100	100	100	100	100
8/21	100	100	100	100	100	100	100	100	100	100	100	100	100
8/22	100	100	100	100	100	100	100	100	100	100	100	100	100
8/23	100	100	100	100	100	100	100	100	100	100	100	100	100
8/24	100	100	100	100	100	100	100	100	100	100	100	100	100
8/25	100	100	100	100	100	100	100	100	100	100	100	100	100
8/26	100	100	100	100	100	100	100	100	100	100	100	100	100
8/27	100	100	100	100	100	100	100	100	100	100	100	100	100
8/28	100	100	100	100	100	100	100	100	100	100	100	100	100
8/29	100	100	100	100	100	100	100	100	100	100	100	100	100

Appendix B.9. Historical daily and cumulative CPUE for coho salmon catches in the Bethel test fishery, 1985 - 1996.

Date	Daily CPUE												Cumulative CPUE											
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
7/15	0	2	0 c	0	2	0	0	0	0	2	0	8	0	2	0 c	2	6	0	0	8	7	5	0	34
7/16	0	2	0	0	0	0	0	2	0	2	0	17 c	0	4	0	2	6	0	0	10	7	8	0	52 c
7/17	2	2	0	4	2	0	0	1	0	0	0	35	2	6	0	6	8	0	0	11	7	8	0	86
7/18	0	2	0	0 c	4 c	0	0 c	7	0	2	0 c	17	2	8	0	6 c	12 c	0	0 c	18	7	10	0 c	104
7/19	2	4	0	0	0	4	2	9	9	9 c	0	122 c	3	11	0	6	12	4	2	27	16	18 c	0	226 c
7/20	4	4	0 c	4	10	13	6	5	2	0	4	108	7	15	0 c	10	22	17	8	31	18	18	4	334
7/21	5	10	0	2 c	7	10	7	3	5	0	0 c	194	12	25	0	12 c	30	27	15	34	23	18	4 c	528
7/22	20	8	7	4	16	7	4 c	7	24	22	0	120 c	33	33	7	16	46	34	19 c	40	47	40	4	647 c
7/23	0	21	2	0	6	3	6	2	28	6 c	6	97	33	54	9	16	51	37	25	43	75	46 c	11	745
7/24	2	54	0	12	6	8	4	4	9	48	2	240	35	107	9	28	57	45	29	47	84	95	13	984
7/25	24	29	0	16 c	4	2	7 c	9	6	38	18	675 c	59	136	9	44 c	61	47	36 c	55	90	133	31	1,660 c
7/26	21	26	0	8	0	2	2	11	4	11 c	8	615	80	163	9	53	61	49	38	66	95	144 c	39	2,275
7/27	8	74	2	44	2 c	10	23	10	20	13	11	256	88	236	11	97	63 c	59	61	76	114	157	50	2,531
7/28	15	20	2	72 c	9	43	34	11	71	27	15	170	103	256	14	169 c	72	102	95	86	185	184	65	2,701
7/29	40	64	12	28	8	35	42 c	23	67	26 c	4	517 c	143	320	25	197	80	136	137 c	110	252	210 c	69	3,219 c
7/30	14	54	5	43	37	12	71	25	69	66	22	598	157	374	30	239	117	148	208	135	322	276	91	3,817
7/31	29	31 c	5	75	343	10	64	13	73 c	101	25	482 c	186	405 c	35	314	460	158	271	148	395 c	377	116	4,298 c
8/01	50 c	323	13	43 c	218	26 c	42 c	32	73	75	36	186	237 c	727	47	358 c	678	184 c	314 c	179	468	452	151	4,484
8/02	37	101	40	32	447	22	24	17	148	33	30	322	274	828	87	390	1,125	205	337	196	616	486	181	4,806
8/03	69	404	93	79	78 c	21	118	50 c	302	21	337	38 c	343	1,233	180	468	1,203 c	226	455	246 c	917	507	517	4,844 c
8/04	60	419 c	69	42 c	24	54	124	11	538 c	13 c	150 c	35	402	1,652 c	249	511 c	1,227	280	679	257	1,455 c	520 c	668 c	4,879
8/05	47 c	253	27	45	159	65	10 c	11	127	2	102	79	450 c	1,905	276	556	1,386	345	589 c	268	1,582	522	769	4,958
8/06	92	249	42 c	300	348	78 c	32	57 c	318 c	24	131	26	542	2,154	318 c	856	1,734	423 c	621	325 c	1,900 c	545	900	4,984
8/07	182	210 c	103	370	195 c	50	20	56	102	178	145	27 c	724	2,363 c	421	1,226	1,929 c	473	641	381	2,002	723	1,045	5,011 c
8/08	86 c	86	53	183 c	54	73	64 c	115	73	230	32 c	25	809 c	2,450	475	1,409 c	1,983	546	705 c	496	2,075	953	1,077 c	5,037
8/09	114	180	34	41	185 c	118	43	250	34 c	156 c	109	120	924	2,630	509	1,450	2,168 c	664	748	746	2,108 c	1,110 c	1,186	5,157
8/10	124	297	43	106 c	33	58 c	42	675	11	190	69	94 c	1,047	2,927	551	1,556 c	2,202	722 c	790	1,421	2,120	1,300	1,255	5,251 c
8/11	218	87 c	35	257	111	64	35	420 c	25	392	69	38	1,266	3,014 c	587	1,813	2,312	786	824	1,841 c	2,144	1,691	1,324	5,289
8/12	96 c	326	189	256 c	74 c	210	248 c	91	66	137 c	35 c	39	1,361 c	3,340	776	2,070 c	2,386 c	996	1,072 c	1,932	2,210	1,828 c	1,359 c	5,328
8/13	75	96 c	142 c	68	24	180 c	91	123	32	64	75	63 c	1,437	3,436 c	918 c	2,138	2,410	1,176 c	1,163	2,056	2,242	1,892	1,434	5,391 c
8/14	29	64	348	174	17	166	40 c	128 c	0 c	93	186	44	1,466	3,501	1,266	2,312	2,427	1,342	1,203 c	2,183 c	2,242 c	1,985	1,620	5,435
8/15	84 c	180 c	205	185 c	2 c	258	36	41	9	66 c	29	56	1,550 c	3,681 c	1,470	2,497 c	2,429 c	1,600	1,239	2,224	2,252	2,051 c	1,649	5,491
8/16	68	55	121	58	0	108 c	20	80	109	72	28 c	27 c	1,619	3,735	1,591	2,555	2,429	1,708 c	1,259	2,304	2,361	2,123	1,677 c	5,518 c
8/17	19	48	107 c	152	15	91	25	78 c	18 c	307	44	2	1,637	3,784	1,699 c	2,706	2,444	1,798	1,284	2,382 c	2,379 c	2,430	1,721	5,520
8/18	23	101 c	52	112 c	4 c	86	88	41	33	188 c	45	19	1,661	3,885 c	1,751	2,818 c	2,448 c	1,884	1,371	2,422	2,412	2,619 c	1,766	5,539
8/19	8 c	91	19 c	35	6	61	35 c	32	136	22	8 c	35	1,669 c	3,976	1,770 c	2,853	2,455	1,945	1,406 c	2,455	2,548	2,640	1,775 c	5,574
8/20	12	30	9	41 c	14	83 c	26	137 c	114	60	13	25 c	1,680	4,006	1,779	2,894 c	2,468	2,029 c	1,433	2,592 c	2,662	2,700	1,788	5,599 c
8/21	17	94 c	16 c	10	35	39	38	17	27 c	64	31	6	1,698	4,100 c	1,795 c	2,903	2,503	2,067	1,471	2,609	2,689 c	2,765	1,819	5,605
8/22	0 c	52	9	74	22	69	20	42	4	19 c	54 c	4	1,698 c	4,152	1,804	2,978	2,525	2,136	1,491	2,651	2,693	2,784 c	1,873 c	5,609
8/23	17	136	21	68	11 c	131	10	53	0	13	26	9 c	1,715	4,288	1,825	3,046	2,536 c	2,267	1,501	2,703	2,693	2,797	1,899	5,616 c
8/24	8	100	25 c	108	3	40	26	4 c	4	141	12	14	1,723	4,388	1,850 c	3,154	2,539	2,307	1,527	2,707 c	2,697	2,938	1,911	5,630
8/25	12	26 c	9	121	26	61	14	21	9 c	81 c	43	57	1,734	4,414 c	1,859	3,275	2,564	2,368	1,540	2,729	2,706 c	3,019 c	1,954	5,687
8/26	0 c	43	19	89	10 c	56	42 c	13	18	42	27 c	12	1,734 c	4,457	1,878	3,364	2,574 c	2,424	1,583 c	2,741	2,724	3,061	1,981 c	5,699
8/27	10	10	32 c	64 c	17	39 c	17	9 c	10	59 c	2	0	1,744	4,467	1,910 c	3,428 c	2,591	2,463 c	1,600	2,750 c	2,734	3,119 c	1,983	5,699
8/28	34	4 c	50	9	17	2	18	4	12 c	19	11	0	1,778	4,471 c	1,960	3,437	2,609	2,465	1,618	2,754	2,745 c	3,138	1,994	5,699
8/29	12 c		35	4	6 c	13	18	2	13	2	4 c		1,790 c		1,995	3,441	2,615 c	2,477	1,636	2,757	2,758	3,141	1,998 c	
8/30	0		48		2	8	9	5	5	9 c			1,790		2,043		2,616	2,485	1,645	2,762	2,763	3,150 c		
8/31			0 c	c	7	0	0	4 c	2						2,043 c	c	2,624	2,485	1,645	2,766 c	2,765	3,150		
9/01		c	20		c				c		c				c	2,063	c				c		c	

"c" indicates days when commercial fishing periods occurred in District 1

Appendix B.10. Historical daily percent passage for coho salmon catches in the Bethel test fish, 1985 - 1996.

Date	Percent Passage by Year												
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	Mean 85-96
7/15	0	0	0	0	0	0	0	0	0	0	0	1	0
7/16	0	0	0	0	0	0	0	0	0	0	0	1	0
7/17	0	0	0	0	0	0	0	0	0	0	0	2	0
7/18	0	0	0	0	0	0	0	1	0	0	0	2	0
7/19	0	0	0	0	0	0	0	1	1	1	0	4	0
7/20	0	0	0	0	1	1	0	1	1	1	0	6	1
7/21	1	1	0	0	1	1	1	1	1	1	0	9	1
7/22	2	1	0	0	2	1	1	1	2	1	0	11	1
7/23	2	1	0	0	2	1	1	2	3	1	1	13	1
7/24	2	2	0	1	2	2	2	2	3	3	1	17	2
7/25	3	3	0	1	2	2	2	2	3	4	2	29	2
7/26	4	4	0	2	2	2	2	2	3	5	2	40	3
7/27	5	5	1	3	2	2	4	3	4	5	2	44	3
7/28	6	6	1	5	3	4	6	3	7	6	3	47	4
7/29	8	7	1	6	3	5	8	4	9	7	3	56	6
7/30	9	8	1	7	4	6	13	5	12	9	5	67	7
7/31	10	9	2	9	18	6	16	5	14	12	6	75	10
8/01	13	16	2	10	26	7	19	6	17	14	8	79	13
8/02	15	19	4	11	43	8	20	7	22	15	9	84	16
8/03	19	28	9	14	46	9	28	9	33	16	26	85	21
8/04	22	37	12	15	47	11	35	9	53	17	33	86	26
8/05	25	43	14	16	53	14	36	10	57	17	38	87	29
8/06	30	48	16	25	66	17	38	12	69	17	45	87	35
8/07	40	53	21	36	74	19	39	14	72	23	52	88	40
8/08	45	55	23	41	76	22	43	18	75	30	54	88	44
8/09	52	59	25	42	83	27	45	27	76	35	59	90	48
8/10	59	65	27	45	84	29	48	51	77	41	63	92	54
8/11	71	67	29	53	88	32	50	67	78	54	66	93	59
8/12	76	75	38	60	91	40	65	70	80	58	68	93	66
8/13	80	77	45	62	92	47	71	74	81	60	72	95	69
8/14	82	78	62	67	93	54	73	79	81	63	81	95	74
8/15	87	82	72	73	93	64	75	80	81	65	83	96	78
8/16	90	84	78	74	93	69	76	83	85	67	84	97	80
8/17	91	85	83	79	93	72	78	86	86	77	86	97	83
8/18	93	87	86	82	93	76	83	88	87	83	88	97	86
8/19	93	89	87	83	94	78	85	89	92	84	89	98	87
8/20	94	90	87	84	94	82	87	94	96	86	89	98	89
8/21	95	92	88	84	95	83	89	94	97	88	91	98	91
8/22	95	93	88	87	96	86	91	96	97	88	94	98	92
8/23	96	96	89	89	97	91	91	98	97	89	95	99	93
8/24	96	98	91	92	97	93	93	98	98	93	96	99	95
8/25	97	99	91	95	98	95	94	99	98	96	98	100	96
8/26	97	100	92	98	98	98	96	99	98	97	99	100	97
8/27	97	100	93	100	99	99	97	99	99	99	99	100	98
8/28	99	100	96	100	99	99	98	100	99	100	100	100	99
8/29	100		98	100	100	100	99	100	100	100	100		100
8/30	100		100		100	100	100	100	100	100			100
8/31			100		100	100	100	100	100				100

Appendix B.11 Lower Kuskokwim River, District 1, and the middle Kuskokwim River, District 2, combined commercial salmon harvest, 1960-1996.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1960	5,969	0	2,498	0	0	8,467
1961	18,918	0	5,044	0	0	23,962
1962	15,341	0	12,432	0	0	27,773
1963	12,016	0	15,660	0	0	27,676
1964	17,149	0	28,613	0	0	45,762
1965	21,989	0	12,191	0	0	34,180
1966	25,545	0	22,985	0	0	48,530
1967	29,986	0	56,313	0	148	86,447
1968	34,278	0	127,306	0	187	161,771
1969	43,997	322	83,765	0	7,165	135,249
1970	39,290	117	38,601	44	1,664	79,716
1971	40,274	2,606	5,253	0	68,914	117,047
1972	39,454	102	22,579	8	78,619	140,762
1973	32,838	369	130,876	33	148,746	312,862
1974	18,664	136	147,269	84	171,887	338,040
1975	21,720	23	81,945	10	181,840	285,538
1976	30,735	2,971	88,501	133	177,864	300,204
1977	35,830	9,379	241,364	203	248,721	535,497
1978	45,641	733	213,393	5,832	248,656	514,255
1979	38,966	1,054	219,060	78	261,874	521,032
1980	35,881	360	222,012	803	483,211	742,267
1981	47,663	48,375	211,251	292	418,677	726,258
1982	48,234	33,154	447,117	1,748	278,306	808,559
1983	33,174	68,855	196,287	211	267,698	566,225
1984	31,742	48,575	623,447	2,942	423,718	1,130,424
1985	37,889	106,647	335,606	75	199,478	679,695
1986	19,414	95,433	659,988	3,422	309,213	1,087,470
1987	36,179	136,602	399,467	43	574,336	1,146,627
1988	55,716	92,025	524,296	10,825	1,381,674	2,064,536
1989	43,217	42,747	479,856	464	749,182	1,315,466
1990	53,759	84,870	410,332	3,397	461,624	1,013,982
1991	37,778	108,946	500,935	378	431,802	1,079,839
1992	46,872	92,218	666,170	7,451	344,603	1,157,314
1993	8,735	27,008	610,739	64	43,337	689,883
1994	16,211	49,365	724,689	30,949	271,115	1,092,329
1995	30,846	92,500	471,461	93	605,918	1,200,818
1996	7,419	33,878	937,299	1,621	207,877	1,188,094
Ten Year Average (1986-1995)	34,873	82,171	544,793	11,209[a]	517,280	1,184,826

a Even years only.

Appendix B.12. Historical commercial salmon catches by fishing period in Kuskowim Area District 1.

Year	Date		Number of Permits	Hours Fished	Permit Hours	Chinook		Sockeye		Chum		Coho	
						Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE
1974	Jun	10 - 11 [a]	422	12	5,064	4,384	0.9	1	0.0	153	0.0	0	0.0
	Jun	13 - 14 [a]	488	12	5,856	5,790	1.0	2	0.0	607	0.1	0	0.0
	Jun	17 - 18 [a]	506	12	6,072	5,857	1.0	62	0.0	1,394	0.2	0	0.0
	Jun	27 [b]	267	6	1,602	558	0.3	0	0.0	27,017	16.9	0	0.0
	Jul	01 - 02 [b]	380	12	4,560	561	0.1	26	0.0	55,356	12.1	0	0.0
	Jul	04 - 05 [b]	282	12	3,384	196	0.1	0	0.0	27,211	8.0	0	0.0
	Jul	08 - 09 [b]	376	12	4,512	286	0.1	1	0.0	50,672	11.2	0	0.0
	Jul	18 [b]	190	6	1,140	31	0.0	0	0.0	6,661	5.8	19	0.0
	Aug	01 - 02 [b]	267	12	3,204	17	0.0	9	0.0	813	0.3	9,576	3.0
	Aug	05 - 08 [b]	444	72	31,968	18	0.0	35	0.0	1,170	0.0	59,090	1.8
	Aug	12 - 15 [b]	396	72	28,512	12	0.0	0	0.0	103	0.0	58,066	2.0
	Aug	19 - 22 [b]	263	72	18,936	0	0.0	0	0.0	32	0.0	12,301	0.6
	Aug	26 - 29 [b]	107	72	7,704	1	0.0	0	0.0	10	0.0	5,360	0.7
	Sept.	02 - 05 [b]	25	72	1,800	0	0.0	0	0.0	0	0.0	430	0.2
Total			666	456	124,314	17,711		136		171,199		144,842	
1975	Jun	16 [a]	12	6	72	359	4.99	0	0.0	3	0.0	0	0.0
	Jun	19 - 20 [a]	46	12	552	1,031	1.87	0	0.0	34	0.1	0	0.0
	Jun	23 - 24 [a]	483	12	5,796	17,235	2.97	0	0.0	3,792	0.7	0	0.0
	Jun	30 [b]	276	6	1,656	691	0.42	0	0.0	31,216	18.9	0	0.0
	Jul	03 [b]	360	6	2,160	636	0.29	0	0.0	35,525	16.4	0	0.0
	Jul	07 [b]	369	6	2,214	421	0.19	0	0.0	39,396	17.8	0	0.0
	Jul	10 [b]	304	6	1,824	195	0.11	0	0.0	39,910	21.9	0	0.0
	Jul	14 [b]	326	6	1,956	179	0.09	0	0.0	21,092	10.8	0	0.0
	Aug	01 [b]	142	6	852	5	0.01	0	0.0	2,113	2.5	2,357	2.8
	Aug	04 - 06 [b]	292	48	14,016	40	0.00	1	0.0	5,639	0.4	12,500	0.9
	Aug	11 - 13 [b]	373	48	17,904	8	0.00	0	0.0	2,247	0.1	18,551	1.0
	Aug	18 - 20 [b]	388	48	18,624	16	0.00	3	0.0	746	0.0	34,435	1.8
	Aug	25 - 27 [b]	270	48	12,960	0	0.00	0	0.0	73	0.0	16,277	1.3
Total			737	258	80,586	20,816		4		181,786		84,120	

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Appendix B.12. (page 2 of 13)

Year	Date	Number of Permits	Hours Fished	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
1976	Jun 17 [a]	459	6	2,754	6,962	2.5	1	0.0	532	0.2	0	0.00
	Jun 21 [a]	495	6	2,970	13,048	4.4	0	0.0	2,543	0.9	0	0.00
	Jun 28 [b]	348	6	2,088	4,143	2.0	508	0.2	42,464	20.3	0	0.00
	Jul 01 [b]	415	6	2,490	1,550	0.6	338	0.1	44,024	17.7	0	0.00
	Jul 08 [b]	381	6	2,286	894	0.4	1,268	0.6	48,669	21.3	0	0.00
	Jul 12 [b]	344	6	2,262	344	0.2	701	0.3	21,153	9.4	0	0.00
	Jul 15 [b]	265	6	1,590	236	0.1	151	0.1	14,176	8.9	44	0.03
	Aug 02 - 03 [b]	286	24	6,864	83	0.0	0	0.0	2,067	0.3	10,534	1.53
	Aug 09 - 11 [b]	400	48	19,200	96	0.0	3	0.0	866	0.0	29,728	1.55
	Aug 16 - 18 [b]	387	48	18,576	50	0.0	1	0.0	154	0.0	28,664	1.54
	Aug 23 - 25 [b]	300	48	14,400	10	0.0	0	0.0	69	0.0	14,543	1.01
	Aug 30 - 31 [b]	174	42	7,308	2	0.0	0	0.00	10	0.0	4,420	0.60
Total		674	252	82,788	27,418		2,971		176,727		87,933	
1977	Jun 15 [a]	467	6	2,802	12,458	4.45	20	0.0	334	0.12	0	0.00
	Jun 20 [a]	484	6	2,904	16,227	5.59	18	0.0	1,715	0.59	0	0.00
	Jun 27 [b]	378	6	2,268	1,337	0.59	1,386	0.6	40,321	17.78	0	0.00
	Jun 30 [b]	409	6	2,454	504	0.21	3,655	1.5	58,884	24.00	0	0.00
	Jul 04 [b]	331	6	1,986	266	0.13	1,952	1.0	37,500	18.88	0	0.00
	Jul 07 [b]	368	6	2,208	407	0.18	1,799	0.8	56,943	25.79	0	0.00
	Jul 14 [b]	385	6	2,310	153	0.07	77	0.0	24,765	10.72	1	0.00
	Aug 01 - 02 [b]	360	24	8,640	91	0.01	392	0.0	7,157	0.83	23,987	2.78
	Aug 08 [b]	487	48	23,376	117	0.01	59	0.0	3,306	0.14	91,474	3.91
	Aug 15 - 16 [b]	438	24	10,512	57	0.01	4	0.0	1,161	0.11	60,935	5.80
	Aug 18 [b]	378	12	4,536	13	0.00	1	0.0	224	0.05	25,589	5.64
	Aug 22 [b]	361	12	4,332	12	0.00	6	0.0	202	0.05	16,980	3.92
	Aug 25 [b]	264	12	3,168	12	0.00	0	0.0	127	0.04	11,874	3.75
	Aug 29 [b]	204	12	2,448	5	0.00	0	0.0	42	0.02	6,819	2.79
Total		653	186	73,944	31,659		9,369		232,681		237,659	

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Appendix B.12. (page 3 of 13)

Year	Date		Number of Permits	Hours Fished	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
1978	Jun	09 [a]	509	6	3,054	7,590	2.49	10	0.0	734	0.24	0	0.00
	Jun	14 [a]	266	6	1,596	6,142	3.85	0	0.0	1,291	0.81	0	0.00
	Jun	16 [a]	396	6	2,376	12,341	5.19	22	0.0	5,950	2.50	0	0.00
	Jun	22 [a]	72	4	288	1,724	5.99	0	0.0	1,629	5.66	0	0.00
	Jun	23 [a]	429	4	1,716	8,342	4.86	0	0.0	12,587	7.34	0	0.00
	Jun	26 [b]	499	5	2,694	1,964	0.73	1	0.0	44,296	16.44	0	0.00
	Jun	29 [b]	422	6	2,652	1,759	0.66	52	0.0	36,793	13.87	0	0.00
	Jul	03 [b]	476	6	2,856	894	0.31	93	0.0	26,629	9.32	0	0.00
	Jul	06 [b]	485	12	5,820	1,460	0.25	302	0.1	48,031	8.25	0	0.00
	Jul	10 [b]	428	12	5,136	694	0.14	216	0.0	48,931	9.53	0	0.00
	Jul	13 [b]	422	6	2,532	293	0.12	0	0.0	14,935	5.90	0	0.00
	Aug	01 [b]	297	12	3,564	97	0.03	23	0.0	3,298	0.93	6,311	1.77
	Aug	04 [b]	364	12	4,368	79	0.02	6	0.0	906	0.21	9,445	2.16
	Aug	08 [b]	433	12	5,196	65	0.01	4	0.0	629	0.12	28,501	5.49
	Aug	11 [b]	485	12	5,820	39	0.01	2	0.0	280	0.05	42,428	7.29
	Aug	15 [b]	476	12	5,712	33	0.01	0	0.0	87	0.02	48,950	8.57
	Aug	18 [b]	434	12	5,208	16	0.00	2	0.0	67	0.01	29,485	5.66
	Aug	22 [b]	396	12	4,752	8	0.00	0	0.0	53	0.01	22,287	4.69
	Aug	25 [b]	293	12	3,516	12	0.00	0	0.0	13	0.00	11,168	3.18
	Aug	29 [b]	250	12	3,000	1	0.00	0	0.0	80	0.03	12,215	4.07
Total			723	182	71,856	43,553		733		247,219		210,790	
1979	Jun	11 [a]	523	6	3,138	12,270	3.91	14	0.00	462	0.15	0	0.00
	Jun	15 [a]	549	6	3,294	12,363	3.75	37	0.01	2,055	0.62	0	0.00
	Jun	22 [b]	502	6	3,012	5,651	1.88	50	0.02	32,295	10.72	0	0.00
	Jun	26 [b]	531	6	3,186	2,277	0.71	23	0.01	53,648	16.84	0	0.00
	Jun	29 [b]	542	6	3,252	1,583	0.49	8	0.00	48,643	14.96	0	0.00
	Jul	03 [b]	542	6	3,252	1,233	0.38	21	0.01	83,164	25.57	0	0.00
	Jul	10 [b]	520	6	3,120	470	0.15	23	0.01	32,434	10.40	0	0.00
	Aug	02 [b]	478	12	5,736	67	0.01	186	0.03	3,643	0.64	52,276	9.11
	Aug	06 [b]	480	6	2,880	38	0.01	54	0.02	1,148	0.40	53,797	18.68
	Aug	09 [b]	497	6	2,982	34	0.01	19	0.01	502	0.17	26,422	8.86
	Aug	13 [b]	463	6	2,778	20	0.01	11	0.00	179	0.06	27,915	10.05
	Aug	16 [b]	467	6	2,802	16	0.01	4	0.00	129	0.05	21,675	7.74
	Aug	20 [b]	390	6	2,340	23	0.01	7	0.00	104	0.04	19,445	8.31
	Aug	23 [b]	328	6	1,968	0	0.00	0	0.00	54	0.03	5,376	2.73
	Aug	27 [b]	310	12	3,720	6	0.00	2	0.00	40	0.01	6,342	1.70
	Aug	30 [b]	179	12	2,148	2	0.00	1	0.00	16	0.01	2,182	1.02
Total			685	114	49,608	36,053		460		258,516		215,430	

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Year	Date		Number of Permits	Hours Fished	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
1980	Jun	12 [a]	469	6	2,814	9,891	3.51	2	0.00	711	0.25	0	0.00
	Jun	18 [a]	468	6	2,808	16,921	6.03	24	0.01	5,940	2.12	0	0.00
	Jun	23 [b]	426	6	2,616	4,777	1.83	0	0.00	105,825	40.45	0	0.00
	Jun	26 [b]	408	6	2,448	1,460	0.60	0	0.00	131,945	53.90	0	0.00
	Jul	02 [b]	383	6	2,298	498	0.22	23	0.01	122,613	53.36	0	0.00
	Jul	09 [b]	431	6	2,586	445	0.17	4	0.00	90,233	34.89	0	0.00
	Aug	04 [b]	375	6	2,250	54	0.02	73	0.03	2,697	1.20	9,889	4.40
	Aug	07 [b]	455	6	2,730	45	0.02	67	0.02	2,098	0.77	36,126	13.23
	Aug	11 [b]	482	6	2,892	33	0.01	64	0.02	4,350	1.50	35,178	12.16
	Aug	14 [b]	439	6	2,634	23	0.01	38	0.01	366	0.14	28,211	10.71
	Aug	18 [b]	441	6	2,646	12	0.00	25	0.01	179	0.07	43,748	16.53
	Aug	21 [b]	419	6	2,514	10	0.00	26	0.01	94	0.04	33,274	13.24
	Aug	25 [b]	370	6	2,220	12	0.01	9	0.00	64	0.03	19,264	8.68
	Aug	28 [b]	319	6	1,914	3	0.00	5	0.00	19	0.01	13,484	7.04
Total			663	84	35,370	34,184		360		467,134		219,174	
1981	Jun	10 [a]	489	6	2,934	11,897	4.05	48	0.0	2,623	0.89	0	0.00
	Jun	16 [a]	541	6	3,246	17,985	5.54	316	0.1	11,501	3.54	0	0.00
	Jun	22 [b]	511	6	3,066	3,830	1.25	3,852	1.3	78,168	25.50	0	0.00
	Jun	25 [b]	508	6	3,048	2,000	0.66	6,037	2.0	81,431	26.72	0	0.00
	Jun	30 [b]	484	6	2,904	2,563	0.88	12,262	4.2	51,942	17.89	0	0.00
	Jul	02 [b]	459	6	2,754	1,707	0.62	9,769	3.5	58,594	21.28	0	0.00
	Jul	06 [b]	461	6	2,766	1,088	0.39	5,510	2.0	55,799	20.17	0	0.00
	Jul	09 [b]	440	6	2,640	941	0.36	7,760	2.9	66,138	25.05	0	0.00
	Aug	03 [b]	430	6	2,580	101	0.04	1,057	0.4	1,866	0.72	16,184	6.27
	Aug	06 [b]	441	6	2,646	77	0.03	674	0.3	1,046	0.40	13,885	5.25
	Aug	10 [b]	445	6	2,670	54	0.02	454	0.2	629	0.24	26,972	10.10
	Aug	13 [b]	473	6	2,838	54	0.02	233	0.1	448	0.16	46,252	16.30
	Aug	17 [b]	458	6	2,748	38	0.01	146	0.1	164	0.06	34,739	12.64
	Aug	20 [b]	380	6	2,280	17	0.01	55	0.0	73	0.03	24,184	10.61
	Aug	24 [b]	372	6	2,232	16	0.01	28	0.0	40	0.02	23,771	10.65
	Aug	27 [b]	346	6	2,076	16	0.01	25	0.0	59	0.03	13,785	6.64
	Aug	31 [b]	278	6	1,668	8	0.00	20	0.0	21	0.01	8,086	4.85
Total			679	102	45,096	42,011		45,554		410,542		207,858	

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Year	Date	Number of Permits	Hours Fished	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
1982	Jun 14 [a]	464	6	2,784	4,912	1.76	321	0.12	2,532	0.91	0	0.00
	Jun 17 [a]	496	6	2,892	11,285	3.90	1,061	0.37	4,694	1.62	0	0.00
	Jun 21 [a]	499	6	2,994	13,343	4.46	2,432	0.81	10,003	3.34	0	0.00
	Jun 24 [a]	459	4	1,836	8,548	4.66	3,157	1.72	12,908	7.03	0	0.00
	Jun 28 [b]	352	4	1,408	1,943	1.38	9,938	7.06	58,528	41.57	0	0.00
	Jun 30 [b]	483	4	1,932	2,064	1.07	5,824	3.01	47,773	24.73	0	0.00
	Jul 02 [b]	434	4	1,736	1,095	0.63	3,110	1.79	38,918	22.42	0	0.00
	Jul 05 [b]	372	6	2,232	875	0.39	2,769	1.24	29,315	13.13	0	0.00
	Jul 08 [b]	435	6	2,610	748	0.29	1,786	0.68	28,942	11.09	2	0.00
	Jul 12 [b]	354	6	2,124	307	0.14	638	0.30	20,709	9.75	23	0.01
	Jul 29 [b]	416	6	2,496	114	0.05	48	0.02	2,599	1.04	19,561	7.84
	Aug 02 [b]	388	6	2,328	67	0.03	69	0.03	949	0.41	31,944	13.72
	Aug 05 [b]	445	6	2,670	47	0.02	26	0.01	624	0.23	35,766	13.40
	Aug 09 [b]	442	6	2,652	29	0.01	25	0.01	342	0.13	61,231	23.09
	Aug 12 [b]	449	6	2,694	26	0.01	6	0.00	189	0.07	80,685	29.95
	Aug 16 [b]	420	6	2,520	15	0.01	5	0.00	96	0.04	77,785	30.87
	Aug 19 [b]	403	6	2,418	12	0.00	12	0.00	69	0.03	49,566	20.50
	Aug 23 [b]	349	6	2,094	3	0.00	5	0.00	28	0.01	25,218	12.04
	Aug 26 [b]	314	6	1,884	9	0.00	0	0.00	18	0.01	26,761	14.20
	Aug 30 [b]	302	6	1,812	7	0.00	1	0.00	18	0.01	26,815	14.80
Total		686	112	46,116	45,120		31,233		259,254		435,357	
1983	Jun 13 [a]	489	6	2,934	7,445	2.54	114	0.04	829	0.28	0	0.00
	Jun 16 [a]	450	6	2,700	5,961	2.21	156	0.06	976	0.36	0	0.00
	Jun 20 [b]	474	6	2,844	4,776	1.68	3,289	1.16	28,915	10.17	0	0.00
	Jun 23 [b]	450	6	2,700	3,287	1.22	4,807	1.78	24,625	9.12	0	0.00
	Jun 27 [b]	446	6	2,676	2,566	0.96	10,465	3.91	44,802	16.74	0	0.00
	Jun 30 [b]	547	6	3,282	2,359	0.72	12,490	3.81	55,209	16.82	0	0.00
	Jul 04 [b]	443	6	2,658	1,213	0.46	24,540	9.23	46,176	17.37	0	0.00
	Jul 07 [b]	496	6	2,976	1,202	0.40	7,286	2.45	36,965	12.42	0	0.00
	Jul 11 [b]	466	6	2,796	633	0.23	3,001	1.07	20,560	7.35	0	0.00
	Aug 01 [b]	377	6	2,262	238	0.11	478	0.21	4,041	1.79	9,767	4.32
	Aug 04 [b]	430	6	2,580	237	0.09	272	0.11	2,580	1.00	15,389	5.96
	Aug 08 [b]	383	6	2,298	130	0.06	444	0.19	1,322	0.58	34,541	15.03
	Aug 11 [b]	485	6	2,910	96	0.03	146	0.05	534	0.18	35,268	12.12
	Aug 15 [b]	462	6	2,772	64	0.02	71	0.03	148	0.05	24,072	8.68
	Aug 18 [b]	408	6	2,448	56	0.02	52	0.02	111	0.05	22,822	9.32
	Aug 22 [b]	388	6	2,328	53	0.02	39	0.02	88	0.04	34,918	15.00
	Aug 26 [b]	323	6	1,938	27	0.01	31	0.02	55	0.03	19,039	9.82
Total		679	102	45,102	29,442		67,681		267,936		195,816	

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Appendix B.12. (page 6 of 13)

Year	Date		Number of Permits	Hours Fished	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
1984	Jun	18 [a]	484	6	2,904	10,845	3.73	409	0.14	5,803	2.00	0	0.0
	Jun	21 [a]	443	6	2,658	6,336	2.38	2,618	0.98	22,094	8.31	0	0.0
	Jun	25 [b]	466	6	2,796	3,018	1.08	10,743	3.84	91,773	32.82	0	0.0
	Jun	28 [b]	470	6	2,820	2,625	0.93	10,942	3.88	67,120	23.80	0	0.0
	Jul	02 [b]	483	6	2,898	1,988	0.69	8,145	2.81	69,897	24.12	0	0.0
	Jul	05 [b]	426	6	2,556	1,218	0.48	6,798	2.66	54,981	21.51	1	0.0
	Jul	09 [b]	496	6	2,976	1,211	0.41	2,821	0.95	36,440	12.24	52	0.0
	Jul	12 [b]	436	6	2,616	858	0.33	12/27	0.84	24,269	9.28	196	0.1
	Jul	16 [b]	373	6	2,238	744	0.33	1,121	0.50	18,613	8.32	619	0.3
	Jul	30 [b]	459	6	2,754	351	0.13	281	0.10	2,329	0.85	56,609	20.6
	Aug	02 [b]	401	6	2,406	291	0.12	157	0.07	1,184	0.49	79,240	32.9
	Aug	06 [b]	542	9	4,878	106	0.02	113	0.02	639	0.13	84,406	17.3
	Aug	09 [b]	523	9	4,707	106	0.02	111	0.02	373	0.08	80,990	17.2
	Aug	13 [b]	504	9	4,536	81	0.02	67	0.01	235	0.05	80,268	17.7
	Aug	16 [b]	502	9	4,518	50	0.01	29	0.01	131	0.03	78,342	17.3
	Aug	20 [b]	491	9	4,419	33	0.01	14	0.00	59	0.01	63,829	14.4
	Aug	23 [b]	481	9	4,329	21	0.00	11	0.00	63	0.01	49,372	11.4
	Aug	27 [b]	350	9	3,150	53	0.02	2	0.00	18	0.01	16,472	5.2
	Aug	30 [b]	210	9	1,890	9	0.00	1	0.00	5	0.00	11,222	5.9
	Sept	03 [b]	69	5	360	2	0.01	0	0.00	5	0.01	1,603	4.5
	Sept	06 [b]	39	6	234	0	0.00	0	0.00	0	0.00	1,877	8.0
Total			654	149	62,643	29,946		46,571		396,031		605,098	
1985	Jun	20	423	6	2,538	6,519	2.57	5,246	2.07	19,762	7.79	0	0.00
	Jun	24	488	6	2,928	10,413	3.56	25,536	8.72	42,778	14.61	0	0.00
	Jun	27	492	6	2,952	8,791	2.98	26,155	8.86	47,443	16.07	0	0.00
	Jul	1	514	6	3,084	6,168	2.00	31,082	10.08	47,471	15.39	0	0.00
	Jul	4	460	6	2,760	3,774	1.37	16,114	5.84	28,581	10.36	0	0.00
	Aug	01	487	6	2,922	204	0.07	174	0.06	2,470	0.85	34,052	11.65
	Aug	05	527	6	3,162	121	0.04	33	0.01	1,558	0.49	54,819	17.34
	Aug	08	525	6	3,150	58	0.02	3	0.00	472	0.15	78,149	24.81
	Aug	12	530	6	3,180	44	0.01	7	0.00	342	0.11	77,809	24.47
	Aug	15	441	6	2,646	28	0.01	0	0.00	193	0.07	28,013	10.59
	Aug	19	406	6	2,436	13	0.01	2	0.00	32	0.01	19,316	7.93
	Aug	22	390	6	2,340	10	0.00	0	0.00	56	0.02	17,534	7.49
	Aug	26	297	6	1,782	8	0.00	0	0.00	22	0.01	10,688	6.00
	Aug	29	262	6	1,572	8	0.01	1	0.00	28	0.02	9,568	6.09
Total			654	84	37,452	36,159		104,353		191,208		329,948	

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Appendix B.12. (page 7 of 13)

Year	Date	Number of Permits	Hours Fished	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
1986	Jun 26	514	6	3,084	7,786	2.52	40,468	13.12	68,947	22.36	1	0.00
	Jun 30	576	6	3,456	4,200	1.22	22,633	6.55	60,780	17.59	0	0.00
	Jul 03	556	6	3,336	3,224	0.97	15,766	4.73	65,839	19.74	0	0.00
	Jul 07	586	6	3,516	1,805	0.51	8,347	2.37	55,983	15.92	0	0.00
	Jul 10	532	6	3,192	1,156	0.36	5,488	1.72	48,990	15.35	0	0.00
	Jul 31	352	6	2,112	60	0.03	219	0.10	2,239	1.06	27,553	13.05
	Aug 04	530	6	3,180	49	0.02	201	0.06	1,345	0.42	96,127	30.23
	Aug 07	600	9	5,400	66	0.01	38	0.01	50	0.01	127,024	23.52
	Aug 11	553	6	3,318	32	0.01	3	0.00	9	0.00	82,215	24.78
	Aug 13	526	6	3,156	32	0.01	2	0.00	3	0.00	92,918	29.44
	Aug 15	519	6	3,114	67	0.02	4	0.00	11	0.00	55,633	17.87
	Aug 18	477	6	2,862	15	0.01	4	0.00	0	0.00	51,328	17.93
	Aug 21	465	6	2,790	8	0.00	2	0.00	2	0.00	50,640	18.15
	Aug 25	458	6	2,748	4	0.00	0	0.00	0	0.00	37,365	13.60
	Aug 28	346	6	2,076	0	0.00	0	0.00	3	0.00	16,436	7.92
	Sept 01	234	6	1,404	6	0.00	0	0.00	0	0.00	5,949	4.24
Total		688	99	48,744	18,510		93,175		304,201		643,189	
1987	Jun 18	526	9	4,734	19,126	4.04	9,508	2.01	14,137	2.99	0	0.00
	Jun 24	607	9	5,463	0 [c]	0.00	24,355	4.46	54,454	9.97	0	0.00
	Jun 30	564	9	5,076	0 [c]	0.00	39,112	7.71	112,963	22.25	0	0.00
	Jul 03	580	6	3,480	5,970	1.72	44,030	12.65	66,783	19.19	0	0.00
	Jul 07	578	6	3,468	3,636	1.05	9,196	2.65	103,059	29.72	0	0.00
	Jul 11	597	6	3,582	1,910	0.53	4,611	1.29	72,118	20.13	1	0.00
	Jul 15	569	6	3,414	1,415	0.41	2,301	0.67	71,923	21.07	10	0.00
	Jul 20	551	6	3,306	1,343	0.41	826	0.25	65,135	19.70	500	0.15
	Aug 06	590	6	3,540	207	0.06	271	0.08	4,074	1.15	49,182	13.89
	Aug 13	604	6	3,624	103	0.03	222	0.06	894	0.25	104,968	28.96
	Aug 17	595	6	3,570	76	0.02	133	0.04	378	0.11	73,867	20.69
	Aug 19	585	6	3,510	36	0.01	25	0.01	156	0.04	45,277	12.90
	Aug 21	540	6	3,240	26	0.01	16	0.00	140	0.04	33,601	10.37
	Aug 24	500	6	3,000	27	0.01	4	0.00	108	0.04	27,607	9.20
	Aug 27	479	6	2,874	13	0.00	9	0.00	70	0.02	21,772	7.58
	Aug 31	364	6	2,184	7	0.00	5	0.00	57	0.03	12,873	5.89
	Sept 03	278	6	1,668	8	0.00	3	0.00	31	0.02	11,352	6.81
	Sept 07	132	6	792	4	0.01	4	0.01	19	0.02	4,311	5.44
Total		703	117	60,525	33,907		134,631		566,499		385,321	

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Year	Date	Number of Permits	Hours Fished	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
1988	Jun 16	602	8	4,816	12,640	2.62	7,408	1.54	72,219	15.00	0	0.00
	Jun 20	612	6	3,672	11,708	3.19	14,502	3.95	113,628	30.94	0	0.00
	Jun 24	644	6	3,864	9,710	2.51	19,894	5.15	119,808	31.01	0	0.00
	Jun 28	609	6	3,654	5,350	1.46	17,628	4.82	154,027	42.15	0	0.00
	Jul 02	580	6	3,480	3,531	1.01	15,102	4.34	187,916	54.00	0	0.00
	Jul 05	579	6	3,474	2,340	0.67	7,284	2.10	163,971	47.20	9	0.00
	Jul 08	604	6	3,624	1,891	0.52	3,623	1.00	138,772	38.29	1	0.00
	Jul 11	598	6	3,588	1,628	0.45	2,467	0.69	137,450	38.31	24	0.01
	Jul 14	597	6	3,582	1,751	0.49	822	0.23	116,930	32.64	141	0.04
	Jul 18	567	6	3,402	1,107	0.33	396	0.12	57,749	16.98	502	0.15
	Jul 21	539	6	3,234	621	0.19	164	0.05	39,643	12.26	1,278	0.40
	Jul 25	494	6	2,964	329	0.11	109	0.04	24,893	8.40	6,323	2.13
	Jul 28	552	6	3,312	333	0.10	70	0.02	16,028	4.84	20,970	6.33
	Aug 01	594	6	3,564	201	0.06	32	0.01	6,967	1.95	33,954	9.53
	Aug 04	639	6	3,834	206	0.05	105	0.03	5,152	1.34	76,576	19.97
	Aug 08	640	6	3,840	114	0.03	92	0.02	2,890	0.75	76,345	19.88
	Aug 10	596	6	3,576	73	0.02	9	0.00	1,376	0.38	53,874	15.07
	Aug 12	624	6	3,744	115	0.03	11	0.00	1,422	0.38	84,700	22.62
	Aug 15	613	6	3,678	76	0.02	14	0.00	663	0.18	59,724	16.24
	Aug 18	620	6	3,720	37	0.01	8	0.00	230	0.06	37,415	10.06
	Aug 20	577	6	3,462	29	0.01	5	0.00	121	0.03	24,046	6.95
	Aug 27	532	6	3,192	14	0.00	8	0.00	93	0.03	22,683	7.11
	Aug 31	408	6	2,448	6	0.00	11	0.00	34	0.01	9,852	4.02
Total		746	140	81,724	53,810		89,764		1,361,982		508,417	

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Appendix B.12. (page 9 of 13)

Year	Date	Number of Permits	Hours Fished	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
1989	Jun 19	374	8	2,992	9,204	3.08	5,495	1.84	41,789	13.97	0	0.0
	Jun 23	277	8	2,216	6,011	2.71	7,011	3.16	65,650	29.63	0	0.0
	Jun 26	126	8	1,008	1,862	1.85	3,746	3.72	32,373	32.12	0	0.0
	Jun 30	642	8	5,136	9,232	1.80	10,214	1.99	131,629	25.63	0	0.0
	Jul 03	629	6	3,774	4,600	1.22	5,808	1.54	91,345	24.20	0	0.0
	Jul 05	553	6	3,318	3,311	1.00	2,917	0.88	85,727	25.84	3	0.0
	Jul 08	621	6	3,726	3,136	0.84	3,177	0.85	119,066	31.96	9	0.0
	Jul 11	616	6	3,696	1,691	0.46	1,565	0.42	78,053	21.12	126	0.0
	Jul 14	590	6	3,540	1,216	0.34	796	0.22	44,401	12.54	230	0.0
	Jul 18	437	6	2,622	868	0.33	451	0.17	26,407	10.07	2,216	0.1
	Jul 27	562	6	3,372	210	0.06	95	0.03	5,716	1.70	5,651	0.7
	Aug 03	679	6	4,074	174	0.04	30	0.01	3,615	0.89	99,022	24.3
	Aug 07	642	6	3,852	78	0.02	22	0.01	868	0.23	73,514	19.1
	Aug 09	644	6	3,864	40	0.01	7	0.00	432	0.11	103,158	26.7
	Aug 12	650	6	3,900	34	0.01	8	0.00	122	0.03	81,970	21.0
	Aug 15	616	6	3,696	25	0.01	4	0.00	119	0.03	23,071	6.2
	Aug 18	381	6	2,286	7	0.00	5	0.00	16	0.01	5,938	2.6
	Aug 23	528	6	3,168	19	0.01	14	0.00	21	0.01	30,940	9.8
	Aug 26	508	6	3,048	17	0.01	13	0.00	15	0.00	20,881	6.9
	Aug 29	423	6	2,538	7	0.00	9	0.00	21	0.01	11,080	4.4
	Sept 01	194	6	1,164	3	0.00	1	0.00	7	0.01	3,225	2.8
Total		745	134	66,990	41,745		41,388		727,392		461,034	
1990	Jun 20	630	6	3,780	16,690	4.42	10,318	16.38	30,306	8.02	0	0.00
	Jun 25	611	6	3,666	16,031	4.37	27,024	44.23	58,944	16.08	0	0.00
	Jun 29	645	6	3,870	9,428	2.44	18,774	29.11	74,911	19.36	0	0.00
	Jul 05	591	6	3,546	4,071	1.15	10,759	18.20	86,835	24.49	0	0.00
	Jul 09	589	6	3,534	2,804	0.79	8,757	14.87	91,411	25.87	0	0.00
	Jul 14	625	8	5,000	2,127	0.43	5,467	8.75	79,803	15.96	70	0.01
	Aug 01	611	6	3,666	252	0.07	533	0.87	9,065	2.47	23,549	6.42
	Aug 06	631	6	3,786	306	0.08	133	0.21	4,597	1.21	61,450	16.23
	Aug 10	653	6	3,918	94	0.02	66	0.10	1,269	0.32	58,251	14.87
	Aug 13	642	6	3,852	38	0.01	48	0.07	509	0.13	115,444	29.97
	Aug 16	650	9	5,850	28	0.00	29	0.04	239	0.04	68,605	11.73
	Aug 20	594	6	3,564	11	0.00	34	0.06	113	0.03	51,838	14.54
	Aug 27	534	6	3,204	3	0.00	16	0.03	25	0.01	16,030	5.00
Total		743	83	51,236	51,883		81,958		438,027		395,237	

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Year	Date	Number of Permits	Hours Fished	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
1991	Jun 20	601	6	3,606	13,813	3.83	19,732	5.47	13,266	3.68	0	0.00
	Jun 24	616	6	3,696	12,612	3.41	19,262	5.21	30,632	8.29	0	0.00
	Jul 01	629	6	3,774	5,966	1.58	24,428	6.47	50,121	13.28	0	0.00
	Jul 06	589	6	3,534	2,102	0.59	24,219	6.85	40,060	11.34	0	0.00
	Jul 13	571	6	3,426	904	0.26	6,458	1.88	52,552	15.34	16	0.00
	Jul 18	568	6	3,408	452	0.13	5,128	1.50	78,797	23.12	977	0.29
	Jul 22	543	6	3,258	233	0.07	3,085	0.95	49,788	15.28	2,655	0.81
	Jul 25	533	8	4,264	186	0.04	1,526	0.36	30,083	7.06	4,871	1.14
	Jul 29	534	8	4,272	134	0.03	732	0.17	24,026	5.62	37,141	8.69
	Aug 01	602	6	3,612	125	0.03	624	0.17	13,098	3.63	38,284	10.60
	Aug 05	643	8	5,144	56	0.01	96	0.02	6,091	1.18	56,262	10.94
	Aug 08	634	8	5,072	33	0.01	40	0.01	3,194	0.63	72,037	14.20
	Aug 12	662	8	5,296	42	0.01	31	0.01	1,586	0.30	114,581	21.64
	Aug 14	601	8	4,808	18	0.00	23	0.00	634	0.13	58,393	12.14
	Aug 19	590	6	3,540	24	0.01	24	0.01	313	0.09	57,364	16.20
	Aug 26	512	8	4,096	6	0.00	12	0.00	93	0.02	43,664	10.66
Total		749	110	64,806	36,706		105,420		394,334		486,245	
1992	Jun 18	567	8	4,536	9,756	2.15	8,508	1.88	32,695	7.21	0	0.00
	Jun 22	619	8	4,952	14,578	2.94	25,017	5.05	74,429	15.03	0	0.00
	Jun 25	627	8	5,016	8,984	1.79	21,922	4.37	55,114	10.99	0	0.00
	Jun 29	602	6	3,612	7,323	2.03	26,082	7.22	80,213	22.21	0	0.00
	Jul 06	587	8	4,696	3,250	0.69	7,962	1.70	84,196	17.93	2	0.00
	Aug 03	619	8	4,952	306	0.06	137	0.03	4,069	0.82	78,233	15.80
	Aug 06	590	6	3,540	116	0.03	98	0.03	1,319	0.37	57,506	16.24
	Aug 11	653	6	3,918	157	0.04	76	0.02	664	0.17	181,905	46.43
	Aug 14	632	6	3,792	63	0.02	55	0.01	196	0.05	87,959	23.20
	Aug 17	596	6	3,576	47	0.01	49	0.01	122	0.03	79,357	22.19
	Aug 20	578	6	3,468	36	0.01	17	0.00	53	0.02	73,363	21.15
	Aug 24	550	6	3,300	27	0.01	19	0.01	23	0.01	28,069	8.51
	Aug 27	481	6	2,886	26	0.01	6	0.00	26	0.01	28,238	9.78
	Aug 31	374	6	2,244	8	0.00	8	0.00	17	0.01	16,962	7.56
Total		741	94	54,488	44,677		89,956		333,136		631,594	

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Year	Date		Number of Permits	Hours Fished	Permit Hours	Chinook		Sockeye		Chum		Coho	
						Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE
1993	Jun	25	622	8	4,976	8,184	1.64	26,363	5.30	34,123	6.86	0	0.00
	Jul	31	625	6	3,750	172	0.05	210	0.06	4,133	1.10	56,107	14.96
	Aug	04	656	6	3,936	98	0.02	141	0.04	2,080	0.53	137,649	34.97
	Aug	06	632	8	5,056	88	0.02	84	0.02	1,396	0.28	91,400	18.08
	Aug	09	628	6	3,768	65	0.02	75	0.02	446	0.12	54,817	14.55
	Aug	14	640	6	3,840	46	0.01	39	0.01	287	0.07	80,226	20.89
	Aug	17	620	6	3,720	30	0.01	31	0.01	119	0.03	82,696	22.23
	Aug	21	592	6	3,552	9	0.00	25	0.01	58	0.02	47,097	13.26
	Aug	25	441	6	2,646	6	0.00	13	0.00	28	0.01	10,556	3.99
	Aug	28	387	6	2,322	12	0.01	19	0.01	30	0.01	13,592	5.85
	Sept	01	274	6	1,644	4	0.00	3	0.00	18	0.01	12,190	7.41
Total			739	70	39,210	8,714		27,003		42,718		586,330	
1994	Jun	24	576	8	4,608	14,221	3.09	38,958	8.45	87,214	18.93	0	0.00
	Jul	14	496	4	1,984	578	0.29	3,891	1.96	43,585	21.97	820	0.41
	Jul	19	500	6	3,000	441	0.15	4,475	1.49	60,104	20.03	7,027	2.34
	Jul	23	506	6	3,036	313	0.10	1,125	0.37	38,149	12.57	24,213	7.98
	Jul	26	552	6	3,312	225	0.09	471	0.14	22,460	6.78	39,901	12.05
	Jul	29	577	6	3,462	204	0.06	159	0.05	11,252	3.25	52,090	15.05
	Aug	04	606	6	3,636	88	0.06	87	0.02	3,983	1.10	75,514	20.77
	Aug	09	530	6	3,180	29	0.03	70	0.02	1,153	0.36	129,570	40.75
	Aug	12	606	8	4,848	34	0.01	47	0.01	777	0.16	117,753	24.29
	Aug	15	595	8	4,760	22	0.01	33	0.01	321	0.07	47,902	10.06
	Aug	18	598	8	4,784	20	0.00	16	0.00	212	0.04	82,750	17.30
	Aug	22	554	8	4,432	12	0.00	15	0.00	104	0.02	44,054	9.94
	Aug	25	447	8	3,576	9	0.00	7	0.00	63	0.02	37,595	10.51
	Aug	27	445	6	2,670	3	0.00	4	0.00	30	0.01	20,526	7.69
	Aug	30	263	6	1,578	2	0.00	2	0.00	16	0.01	8,192	5.19
	Sept	02	157	6	942			2	0.00	3	0.00	2,489	2.64
Total			706	106	53,808	16,201		49,362		269,426		690,396	

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Year	Date	Number of Permits	Hours Fished	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
1995	Jun 22	569	4	2,276	6,895	3.03	4,420	1.94	49,157	21.60	0	0.00
	Jun 26	568	4	2,272	9,452	4.16	19,449	8.56	93,152	41.00	0	0.00
	Jun 29	565	4	2,260	4,972	2.20	18,188	8.05	83,580	36.98	0	0.00
	Jul 03	475	4	1,900	2,847	1.50	17,078	8.99	89,427	47.07	0	0.00
	Jul 06	481	4	1,924	1,521	0.79	14,765	7.67	81,246	42.23	0	0.00
	Jul 10	494	4	1,976	906	0.46	7,100	3.59	86,368	43.71	21	0.01
	Jul 14	435	4	1,740	546	0.31	4,219	2.42	43,137	24.79	221	0.13
	Jul 18	336	6	2,016	366	0.18	2,482	1.23	37,294	18.50	671	0.33
	Jul 21	368	4	1,472	202	0.14	940	0.64	21,039	14.29	1,272	0.86
	Aug 04	234	6	1,404	64	0.05	123	0.09	1,072	0.76	48,665	34.66
	Aug 08	611	6	3,666	95	0.03	363	0.10	1,229	0.34	98,548	26.88
	Aug 12	617	6	3,702	50	0.01	359	0.10	899	0.24	102,421	27.67
	Aug 16	593	6	3,558	52	0.01	147	0.04	208	0.06	65,713	18.47
	Aug 19	555	6	3,330	28	0.01	87	0.03	133	0.04	41,057	12.33
	Aug 22	497	6	2,982	16	0.01	113	0.04	157	0.05	43,978	14.75
	Aug 26	477	6	2,862	25	0.01	117	0.04	101	0.04	29,129	10.18
	Aug 29	355	6	2,130	15	0.01	45	0.02	39	0.02	17,790	8.35
	Sept 01	219	6	1,314	2	0.00	31	0.02	12	0.01	5,783	4.40
Total		712	92	42,784	28,054		90,026		588,250		455,269	

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Appendix B.12. (page 13 of 13)

Year	Date	Number of Permits	Hours Fished	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
1996	Jun 17	245	2	490	2,045	4.17	1,850	3.78	11,560	23.59	0	0.00
	Jun 20	283	2	566	2,046	3.61	6,423	11.35	27,442	48.48	0	0.00
	Jun 24	240	1.5	360	666	1.85	4,420	12.28	19,438	53.99	0	0.00
	Jul 02	224	2	448	545	1.22	3,962	8.84	20,915	46.69	0	0.00
	Jul 05	194	2	388	316	0.81	3,481	8.97	17,651	45.49	2	0.01
	Jul 08	211	2	422	178	0.42	6,795	16.10	18,801	44.55	24	0.06
	Jul 12	237	2	474	230	0.49	3,781	7.98	26,468	55.84	1,608	3.39
	Jul 16	197	2	394	87	0.22	602	1.53	15,192	38.56	4,675	11.87
	Jul 19	267	3	801	164	0.20	298	0.37	13,390	16.72	14,746	18.41
	Jul 22	417	6	2,502	183	0.07	639	0.26	14,504	5.80	50,443	20.16
	Jul 25	487	8	3,896	124	0.03	256	0.07	9,024	2.32	113,637	29.17
	Jul 29	526	6	3,156	97	0.03	186	0.06	3,828	1.21	144,773	45.87
	Jul 31	464	6	2,784	52	0.02	92	0.03	1,541	0.55	122,946	44.16
	Aug 03	541	6	3,246	59	0.02	129	0.04	1,097	0.34	132,540	40.83
	Aug 07	514	6	3,084	43	0.01	73	0.02	581	0.19	94,332	30.59
	Aug 10	502	6	3,012	45	0.01	60	0.02	797	0.26	83,653	27.77
	Aug 13	471	6	2,826	25	0.01	82	0.03	296	0.10	70,053	24.79
	Aug 16	459	6	2,754	28	0.01	147	0.05	215	0.08	49,012	17.80
	Aug 20	400	6	2,400	19	0.01	83	0.03	51	0.02	25,870	10.78
	Aug 23	293	6	1,758	9	0.01	22	0.01	23	0.01	13,133	7.47
	Aug 26	209	6	1,254	11	0.01	23	0.02	13	0.01	8,684	6.93
Total		620	92.5	37,015	6,972		33,404		202,827		930,131	

[a] Gillnet mesh size unrestricted.

[b] Gillnets were restricted to 6 inches or less; after 1985 this restriction was in effect for all periods.

[c] Sales of chinook salmon were prohibited. Estimated chinook harvest was between 12,119 and 13,615 on 6/24 and between 5,831 and 6,555 on 6/25.

Appendix B.13 Utilization of Kuskokwim River chinook salmon, 1960-1996.

Year	Commercial Harvest[a]	Estimated Subsistence Harvest[b]	Total Utilization	Running 10 Year Average
1960	5,969	18,887	24,856	
1961	18,918	28,934	47,852	
1962	15,341	13,582	28,923	
1963	12,016	34,482	46,498	
1964	17,149	29,017	46,166	
1965	21,989	24,697	46,686	
1966	25,545	49,325	74,870	
1967	29,986	59,913	89,899	
1968	34,278	32,942	67,220	
1969	43,997	40,617	84,614	55,758
1970	39,290	69,612	108,902	64,163
1971	40,274	43,242	83,516	67,729
1972	39,454	40,396	79,850	72,822
1973	32,838	39,093	71,931	75,365
1974	18,664	27,139	45,803	75,329
1975	21,720	48,448	70,168	77,677
1976	30,735	58,606	89,341	79,124
1977	35,830	56,580	92,410	79,376
1978	45,641	36,270	81,911	80,845
1979	38,966	56,283	95,249	81,908
1980	35,881	59,892	95,773	80,595
1981	47,663	61,329	108,992	83,143
1982	48,234	58,018	106,252	85,783
1983	33,174	47,412	80,586	86,649
1984	31,742	56,930	88,672	90,935
1985	37,889	43,874	81,763	92,095
1986	19,414	51,019	70,433	90,204
1987	36,179	67,325	103,504	91,314
1988	55,716	70,943[c]	126,659	95,788
1989	43,217	82,098	125,315	98,795
1990	53,504	85,499	139,003	103,118
1991	37,778	85,627	123,406	104,559
1992	46,872	64,702	111,574	105,091
1993	8,735	89,290	98,025	106,835
1994	16,211	95,411	111,622	109,130
1995	30,846	97,193	128,039	113,758
1996	7,419	78,729	86,150	115,330
10 Year Average (1986-1995)	34,847	78,911	113,758	

a District 1, 2 and 3.

b Estimated subsistence harvest expanded from villages surveyed.

c Beginning in 1988, estimates are based on a new formula so data since 1988 is not comparable with previous years.

Appendix B.14. Utilization of Kuskowkim River chum salmon, 1960-1996.

Year	Commercial Harvest[a]	Estimated Subsistence Harvest[b]	Total Utilization	Running 10 Year Average
1960	0	301,753 [c]	301,753	
1961	0	179,529 [c]	179,529	
1962	0	161,849 [c]	161,849	
1963	0	137,649 [c]	137,649	
1964	0	190,191 [c]	190,191	
1965	0	250,878 [c]	250,878	
1966	0	175,735 [c]	175,735	
1967	148	208,445 [c]	208,593	
1968	187	275,008 [c]	275,195	
1969	7,165	204,105 [c]	211,270	209,264
1970	1,664	246,810 [c]	248,474	203,936
1971	68,914	116,391 [c]	185,305	204,514
1972	78,619	120,316 [c]	198,935	208,223
1973	148,746	179,259 [c]	328,005	227,258
1974	171,887	277,170 [c]	449,057	253,145
1975	181,840	176,389 [c]	358,229	263,880
1976	177,864	223,792 [c]	401,656	286,472
1977	248,721	198,355 [c]	447,076	310,320
1978	248,658	118,809 [c]	367,467	319,547
1979	261,874	161,239 [c]	423,113	340,732
1980	483,211	165,172 [c]	648,383	380,723
1981	418,677	157,306 [c]	575,983	419,790
1982	278,306	190,011 [c]	468,317	446,729
1983	267,698	146,876 [c]	414,574	455,386
1984	423,718	142,542 [c]	566,260	467,106
1985	199,478	94,750	294,228	460,706
1986	309,213	141,931 [c]	451,144	465,655
1987	574,336	70,709	645,045	485,451
1988	1,381,674	151,967 [d]	1,533,641	602,069
1989	749,182	140,345	889,527	648,710
1990	461,624	125,626	587,250	642,597
1991	431,802	92,961	524,763	637,475
1992	344,603	96,081	440,684	634,712
1993	43,337	59,259	102,596	603,514
1994	271,115	72,268	343,383	581,226
1995	605,918	68,263	674,181	619,221
1996	207,877	89,430	294,765	603,584
10 Year Average (1986-1995)	517,280	101,941	619,221	

a District 1 and 2

b Estimated subsistence harvest expanded from villages surveyed.

c Includes small numbers of small chinook, sockeye and coho salmon

d Beginning in 1988, estimates are based on a new formula so data since 1988 is not comparable with previous years.

Appendix B.15. Historical commercial salmon catches by fishing period in Kuskowim Area District 2.

Year	Date		Number of Permits	Hours Fished	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
1974	Jun	10 - 14 [a]	26	96	2,496	549	0.2	0	0.0	16	0.0	0	0.0
	Jun	17 - 19 [a]	29	48	1,392	402	0.3	0	0.0	451	0.3	0	0.0
	Aug	5 - 9 [a]	14	96	1,344	2	0.0	0	0.0	210	0.2	990	0.7
	Aug	12 - 13 [a]	13	24	312	0	0.0	0	0.0	11	0.0	1,428	4.6
Total			37	264	5,544	953		0		688		2,418	
1975	Jun	23 - 27 [a]	38	96	3,648	1,319	0.36	0	0.0	2,385	0.7	0	0.0
Total			38	96	3,648	1,319		0		2,385		0	
1976	Jun	21 - 24 [a]	55	66	3,630	3,316	0.9	0	0.0	1,136	0.3	0	0.00
	Aug	23 - 25 [a]	11	24	264	1	0.0	0	0.0	1	0.0	568	2.15
Total			57	90	3,894	3,317		0		1,137		568	
1977	Jun	20 - 21 [a]	83	30	2,490	3,975	1.60	0	0.0	756	0.30	0	
	Jul	4 [a]	54	12	648	195	0.30	10	0.0	15,160	23.40	0	
	Aug	8 [a]	24	12	288	1	0.00	0	0.0	124	0.43	3,705	12.86
Total			105	54	3,426	4,171		10		16,040		3,705	
1978	Jun	14 [a]	8	6	48	359	7.48	0	0.0	59	1.23	0	
	Jun	16 [a]	13	6	78	424	5.44	0	0.0	189	2.42	0	
	Jun	22 [a]	9	4	36	411	11.42	0	0.0	377	10.47	0	
	Jun	23 [a]	24	4	96	893	9.30	0	0.0	804	8.38	0	
	Aug	18 [b]	3	12	36	0	0.00	0	0.0	0	0.00	257	7.14
	Aug	22 [b]	17	12	204	1	0.00	0	0.0	8	0.04	2,346	11.50
Total			43	44	498	2,088		0		1,437		2,603	
1979	Jun	21 [a]	29	12	348	1,030	2.96	142	0.41	982	2.82	0	0.00
	Jun	25 [a]	33	12	396	1,883	4.76	452	1.14	1,946	4.91	0	0.00
	Aug	13 [b]	20	12	240	0	0.00	0	0.00	430	1.79	3,630	15.13
Total			43	36	984	2,913		594		3,358		3,630	
1980	Jun	23 [a]	37	12	444	1,482	3.34	0	0.00	4,004	9.02	0	0.00
	Jul	09 [b]	21	6	126	215	1.71	0	0.00	11,911	94.53	0	0.00
	Aug	14 [b]	12	12	144	0	0.00	0	0.00	702	4.88	2,868	19.92
Total			43	30	714	1,697		0		16,617		2,868	
1981	Jun	16 [a]	18	6	108	933	8.64	4	0.0	810	7.50	0	0.00
	Jun	19 [a]	151	6	906	3,838	4.24	125	0.1	3,902	4.31	0	0.00
	Jun	25 [b]	11	6	66	499	7.56	0	0.0	3,329	50.44	0	0.00
	Aug	17 [b]	15	6	90	0	0.00	0	0.0	62	0.69	1,487	16.52
	Aug	20 [b]	13	6	78	1	0.01	0	0.0	32	0.41	1,896	24.31
Total			153	30	1,248	5,271		129		8,135		3,383	

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Year	Date		Number of Permits	Hours Fished	Permit Hours	Chinook		Sockeye		Chum		Coho	
						Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	CPUE
1982	Jun	17 [a]	10	6	60	222	3.70	19	0.32	274	4.57	0	0.00
	Jun	21 [a]	23	6	138	769	5.57	53	0.38	817	5.92	0	0.00
	Jun	24 [a]	35	6	210	1,122	5.34	434	2.07	1,912	9.10	0	0.00
	Jul	2 [b]	24	6	144	271	1.88	607	4.22	7,060	49.03	0	0.00
	Jul	5 [b]	47	6	282	398	1.41	808	2.87	8,811	31.24	0	0.00
	Aug	9 [b]	15	6	90	2	0.02	0	0.00	144	1.60	1,841	20.46
	Aug	16 [b]	13	6	78	0	0.00	0	0.00	29	0.37	4,567	58.55
	Aug	19 [b]	21	6	126	1	0.01	0	0.00	5	0.04	5,352	42.48
Total			60	48	1,128	2,785		1,921		19,052		11,760	
1983	Jun	16 [a]	14	6	84	510	6.07	13	0.15	165	1.96	0	0.00
	Jun	20 [b]	28	6	168	746	4.44	86	0.51	2,069	12.32	0	0.00
	Jun	23 [b]	34	6	204	820	4.02	338	1.66	2,154	10.56	0	0.00
	Jun	27 [b]	33	6	198	755	3.81	736	3.72	4,276	21.60	0	0.00
	Aug	11 [b]	9	6	54	0	0.00	1	0.02	98	1.81	471	8.72
	Aug	15 [b]	0	6	0	0	0.00	0	0.00	0	0.00	0	0.00
	Aug	18 [b]	0	6	0	0	0.00	0	0.00	0	0.00	0	0.00
Total			43	42	708	2,831		1,174		8,762		471	
1984	Jun	21 [a]	15	6	90	561	6.23	84	0.93	967	10.74	0	0.00
	Jun	25 [b]	25	6	150	493	3.29	543	3.62	5,705	38.03	0	0.00
	Jun	28 [b]	33	6	198	524	2.65	395	1.99	13,376	67.56	0	0.00
	Jul	2 [b]	25	6	150	204	1.36	982	6.55	7,420	49.47	0	0.00
	Aug	06 [b]	16	6	96	9	0.09	0	0.00	110	1.15	4,339	45.20
	Aug	09 [b]	11	6	66	1	0.02	0	0.00	69	1.05	4,340	65.76
	Aug	13 [b]	12	6	72	1	0.01	0	0.00	24	0.33	2,792	38.78
	Aug	16 [b]	17	6	102	1	0.01	0	0.00	16	0.16	3,652	35.80
	Aug	20 [b]	13	6	78	1	0.01	0	0.00	0	0.00	2,179	27.94
	Aug	23 [b]	8	6	48	0	0.00	0	0.00	0	0.00	1,047	21.81
	Aug	27 [b]	0	6	0	0	0.00	0	0.00	0	0.00	0	0.00
	Aug	30 [b]	0	6	0	0	0.00	0	0.00	0	0.00	0	0.00
Total			58	72	1,050	1,795		2,004		27,687		18,349	

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Year	Date	Number of Permits	Hours Fished	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
1985	Jun 20	8	6	48	136	2.83	115	2.40	647	13.48	0	0.00
	Jun 24	11	6	66	263	3.98	340	5.15	2,411	36.53	0	0.00
	Jun 27	12	6	72	548	7.61	739	10.26	2,263	31.43	0	0.00
	Jul 1	15	6	90	779	8.66	1,100	12.22	2,854	31.71	0	0.00
	Jul 4	0	6	0	0	0.00	0	0.00	0	0.00	0	0.00
	Aug 08	6	6	36	0	0.00	0	0.00	41	1.14	739	20.53
	Aug 12	14	6	84	3	0.04	0	0.00	45	0.54	2,914	34.69
	Aug 15	11	6	66	1	0.02	0	0.00	9	0.14	2,005	30.38
Total		23	48	462	1,730		2,294		8,270		5,658	
1986	Jun 26	3	6	18	186	10.33	616	34.22	439	24.39	0	0.00
	Jun 30	13	6	78	386	4.95	1,171	15.01	1,619	20.76	0	0.00
	Jul 3	8	6	48	168	3.50	265	5.52	1,249	26.02	0	0.00
	Jul 7	2	6	12	117	9.75	26	2.17	387	32.25	0	0.00
	Jul 10	6	6	36	45	1.25	179	4.97	1,282	35.61	0	0.00
	Aug 07	8	6	48	0	0.00	0	0.00	0	0.00	2,445	50.94
	Aug 11	10	6	60	0	0.00	0	0.00	23	0.38	2,677	44.62
	Aug 13	10	6	60	0	0.00	1	0.02	13	0.22	2,787	46.45
	Aug 15	27	6	162	1	0.01	0	0.00	0	0.00	5,761	35.56
	Aug 18	8	6	48	1	0.02	0	0.00	0	0.00	1,804	37.58
	Aug 21	6	6	36	0	0.00	0	0.00	0	0.00	1,325	36.81
Total		43	66	606	904		2,258		5,012		16,799	
1987	Jul 03	15	6	90	1,325	14.72	511	5.68	3,200	35.56	0	0.00
	Jul 07	22	6	132	935	7.08	1,459	11.05	4,152	31.45	0	0.00
	Aug 13	14	6	84	4	0.05	1	0.01	304	3.62	2,273	27.06
	Aug 17	14	6	84	6	0.07	0	0.00	102	1.21	3,374	40.17
	Aug 19	13	6	78	1	0.01	0	0.00	39	0.50	3,928	50.36
	Aug 21	18	6	108	1	0.01	0	0.00	40	0.37	4,571	42.32
Total		29	36	576	2,272		1,971		7,837		14,146	

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Year	Date	Number of Permits	Hours Fished	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
1988	Jun 24	13	6	78	669	8.58	1,041	13.35	4,232	54.26	0	0.00
	Jun 28	17	6	102	746	7.31	639	6.26	6,087	59.68	0	0.00
	Jul 2	19	6	114	468	4.11	579	5.08	8,155	71.54	0	0.00
	Aug 08	14	6	84	6	0.07	0	0.00	308	3.67	1,465	17.44
	Aug 10	16	6	96	10	0.10	0	0.00	312	3.25	3,823	39.82
	Aug 12	20	6	120	3	0.03	2	0.02	244	2.03	5,216	43.47
	Aug 15	21	6	126	1	0.01	0	0.00	144	1.14	2,317	18.39
	Aug 18	15	6	90	2	0.02	0	0.00	116	1.29	1,485	16.50
	Aug 20	17	6	102	1	0.01	0	0.00	94	0.92	1,573	15.42
Total		29	54	912	1,906		2,261		19,692		15,879	
1989	Jun 30	15	8	120	610	5.08	587	4.89	7,353	61.28	0	0.0
	Jul 03	18	6	108	371	3.44	238	2.20	5,101	47.23	0	0.0
	Jul 05	14	6	84	264	3.14	176	2.10	3,542	42.17	0	0.0
	Jul 11	14	6	84	128	1.52	95	1.13	4,580	54.52	0	0.0
	Aug 07	22	6	132	3	0.02	0	0.00	238	1.80	6,607	50.1
	Aug 09	18	6	108	3	0.03	0	0.00	114	1.06	5,714	52.9
	Aug 15	15	6	90	1	0.01	0	0.00	7	0.08	1,867	20.7
	Aug 18	20	6	120	3	0.03	0	0.00	11	0.09	2,733	22.8
Total		30	50	846	1,383		1,096		20,946		16,921	
1990	Jun 29	14	6	84	641	7.63	735	8.75	3,838	45.69	0	
	Jul 05	15	6	90	467	5.19	561	6.23	4,397	48.86	0	
	Jul 09	17	6	102	255	2.50	580	5.69	5,163	50.62	0	
	Jul 14	17	8	136	209	1.54	567	4.17	6,999	51.46	0	0.00
	Aug 06	15	6	90	21	0.23	5	0.06	742	8.24	1,111	12.34
	Aug 10	15	6	90	17	0.19	5	0.06	550	6.11	1,946	21.62
	Aug 13	16	6	96	4	0.04	1	0.01	276	2.88	4,192	43.67
	Aug 16	17	9	153	6	0.04	0	0.00	105	0.69	2,239	14.63
	Aug 20	18	6	108	0	0.00	0	0.00	12	0.11	2,548	23.59
	Aug 27	17	6	102	1	0.01	3	0.03	3	0.03	1,780	17.45
Total		22	65	1,051	1,621		2,457		22,085		13,816	

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Year	Date		Number of Permits	Hours Fished	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
1991	Jul	01	17	6	102	483	4.74	1,200	11.76	3,043	29.83	0	
	Jul	06	16	6	96	341	3.55	613	6.39	2,381	24.80	0	
	Jul	13	18	6	108	112	1.04	981	9.08	4,384	40.59	0	0.00
	Jul	18	17	6	102	49	0.48	365	3.58	6,534	64.06	0	0.00
	Jul	22	19	6	114	28	0.25	117	1.03	7,154	62.75	17	0.15
	Jul	25	17	8	136	20	0.15	177	1.30	7,686	56.51	115	0.85
	Jul	29	16	8	128	21	0.16	70	0.55	3,452	26.97	177	1.38
	Aug	05	17	8	136	6	0.04	0	0.00	1,245	9.15	1,596	11.74
	Aug	08	17	8	136	4	0.03	3	0.02	835	6.14	2,381	17.51
	Aug	12	16	8	128	2	0.02	0	0.00	340	2.66	1,829	14.29
	Aug	14	15	8	120	4	0.03	0	0.00	227	1.89	2,461	20.51
	Aug	19	19	6	114	2	0.02	0	0.00	138	1.21	1,689	14.82
	Aug	26	16	8	128	0	0.00	0	0.00	49	0.38	4,425	34.57
Total			23	92	1,548	1,072		3,526		37,468		14,690	
1992	Jun	25	16	8	128	1,021	7.98	930	7.27	3,916	30.59	0	
	Jun	29	15	6	90	815	9.06	525	5.83	2,439	27.10	0	
	Jul	6	9	8	72	310	4.31	486	6.75	2,840	39.44	0	0.00
	Aug	03	17	8	136	27	0.20	317	2.33	1,440	10.59	5,106	37.54
	Aug	06	17	6	102	11	0.11	1	0.01	536	5.25	3,832	37.57
	Aug	11	19	6	114	7	0.06	1	0.01	136	1.19	3,837	33.66
	Aug	14	21	6	126	0	0.00	1	0.01	70	0.56	8,216	65.21
	Aug	17	16	6	96	0	0.00	0	0.00	24	0.25	5,685	59.22
	Aug	20	14	6	84	1	0.01	0	0.00	43	0.51	2,682	31.93
	Aug	24	14	6	84	3	0.04	1	0.01	17	0.20	2,827	33.65
	Aug	27	11	6	66	0	0.00	0	0.00	5	0.08	1,238	18.76
	Aug	31	11	6	66	0	0.00	0	0.00	1	0.02	1,153	17.47
Total			22	78	1,164	2,195		2,262		11,467		34,576	
1993	Aug	06	15	8	120	9	0.08	2	0.02	303	2.53	6,828	56.90
	Aug	09	17	6	102	4	0.04	1	0.01	153	1.50	3,839	37.64
	Aug	14	17	6	102	3	0.03	1	0.01	70	0.69	2,681	26.28
	Aug	17	16	6	96	3	0.03	0	0.00	23	0.24	2,349	24.47
	Aug	21	17	6	102	0	0.00	0	0.00	26	0.25	3,115	30.54
	Aug	25	15	6	90	0	0.00	1	0.01	24	0.27	3,008	33.42
	Aug	28	14	6	84	1	0.01	0	0.00	11	0.13	1,798	21.40
	Sept	01	13	6	78	1	0.01	0	0.00	9	0.12	791	10.14
Total			20	50	774	21		5		619		24,409	

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Appendix B.15. (page 6 of 7)

Year	Date	Number of Permits	Hours Fished	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
1994	Aug 04	14	6	84	6	0.07	0	0.00	808	9.62	4,040	48.10
	Aug 09	17	6	102	3	0.03	0	0.00	350	3.43	5,790	56.76
	Aug 12	17	8	136	0	0.00	0	0.00	226	1.66	10,539	77.49
	Aug 15	16	8	128	0	0.00	1	0.01	151	1.18	7,190	56.17
	Aug 18	15	8	120	1	0.01	0	0.00	106	0.88	2,710	22.58
	Aug 22	12	8	96	0	0.00	1	0.01	34	0.35	1,855	19.32
	Aug 25	7	8	56	0	0.00	0	0.00	12	0.21	1,492	26.64
	Aug 27	6	6	36	0	0.00	1	0.03	2	0.06	677	18.81
Total		20	58	758	10		3		1,689		34,293	
1995	Jun 26	16	4	64	1,656	25.88	535	8.36	3,628	56.69	0	0.00
	Jun 29	13	4	52	707	13.60	620	11.92	3,577	68.79	0	0.00
	Jul 03	9	4	36	284	7.89	456	12.67	2,200	61.11	0	0.00
	Jul 06	8	4	32	74	2.31	331	10.34	2,372	74.13	0	0.00
	Jul 10	6	4	24	32	1.33	293	12.21	1,874	78.08	0	0.00
	Jul 14	2	4	8	7	0.88	51	6.38	480	60.00	0	0.00
	Jul 18	6	6	36	9	0.25	44	1.22	1,638	45.50	6	0.17
	Jul 21	5	4	20	4	0.20	132	6.60	899	44.95	13	0.65
	Aug 04	6	6	36	10	0.28	4	0.11	484	13.44	1,321	36.69
	Aug 08	9	6	54	2	0.04	6	0.11	379	7.02	2,816	52.15
	Aug 12	8	6	48	5	0.10	1	0.02	79	1.65	2,643	55.06
	Aug 16	12	6	72	1	0.01	0	0.00	41	0.57	4,398	61.08
	Aug 19	5	6	30	1	0.03	0	0.00	4	0.13	1,679	55.97
	Aug 22	8	6	48	0	0.00	1	0.02	9	0.19	1,750	36.46
	Aug 26	3	6	18	0	0.00	0	0.00	0	0.00	712	39.56
	Aug 29	3	6	18	0	0.00	0	0.00	4	0.22	660	36.67
	Sept 01	1	6	6	0	0.00	0	0.00	0	0.00	194	32.33
Total		21	88	602	2,792		2,474		17,668		16,192	

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Appendix B.15. (page 7 of 7)

Year	Date	Number of Permits	Hours Fished	Permit Hours	Chinook Catch	Chinook CPUE	Sockeye Catch	Sockeye CPUE	Chum Catch	Chum CPUE	Coho Catch	Coho CPUE
1996	Jun 24	6	2	12	145	12.08	69	5.75	613	51.08	0	0.00
	Jul 2	4	2	8	175	21.88	109	13.63	376	47.00	0	0.00
	Jul 5	3	2	6	8	1.33	38	6.33	606	101.00	0	0.00
	Jul 8	4	4	16	42	2.63	92	5.75	877	54.81	0	0.00
	Jul 12	4	4	16	60	3.75	56	3.50	758	47.38	0	0.00
	Jul 16	1	4	4	5	1.25	33	8.25	336	84.00	3	0.75
	Jul 19	3	4	12	9	0.75	9	0.75	444	37.00	51	4.25
	Jul 22	2	6	12	0	0.00	6	0.50	414	34.50	234	19.50
	Jul 25	3	8	24	2	0.08	5	0.21	367	15.29	700	29.17
	Jul 29	2	6	12	1	0.08	2	0.17	98	8.17	668	55.67
	Jul 31	1	6	6	0	0.00	2	0.33	148	24.67	162	27.00
	Aug 10	2	6	12	0	0.00	0	0.00	0	0.00	787	65.58
	Aug 13	5	6	30	0	0.00	1	0.03	5	0.17	1,761	58.70
	Aug 16	2	6	12	0	0.00	0	0.00	8	0.67	590	49.17
	Aug 20	3	6	18	0	0.00	52	2.89	0	0.00	1,063	59.06
	Aug 23	2	6	12	0	0.00	0	0.00	0	0.00	620	51.67
	Aug 26	5	6	30	0	0.00	0	0.00	0	0.00	541	18.03
Total		8	84	242	447		474		5,050		7,180	

[a] Gillnet mesh size unrestricted.

[b] Gillnets were restricted to 6 inches or less; after 1985 this restriction was in effect for all periods.

Appendix B.16. Historical commercial salmon harvest by statistical area in District 1.

	Stat Area 335-11				Stat Area 335-12				Stat Area 335-13				Stat Area 335-14			
Year	Chinook	Sockeye	Chum	Coho	Chinook	Sockeye	Chum	Coho	Chinook	Sockeye	Chum	Coho	Chinook	Sockeye	Chum	Coho
1984 [a,b]	20,229	45,276	385,178	332,679	9,717	1,295	10,853	272,419								
1985 [c]	18,210	53,548	117,152	168,465	17,949	50,805	74,056	161,483								
1986	9,329	46,505	169,958	301,093	9,181	46,670	134,243	342,096								
1987	20,492	82,403	332,002	226,252	13,415	52,228	234,497	159,069								
1988 [d]	40,355	60,168	861,433	290,872	12,540	27,127	453,012	199,036	915	2,469	47,537	18,509				
1989	29,702	28,319	498,490	233,182	10,856	11,499	203,120	192,796	1,187	1,570	25,782	35,056				
1990 [e]	6,195	8,988	54,431	63,804	29,195	38,113	224,148	196,827	11,762	20,508	101,711	93,928	4,731	14,349	57,737	40,678
1991	4,218	16,961	63,636	98,565	23,104	50,760	165,651	217,820	5,840	19,884	92,063	117,335	3,544	17,815	72,984	52,525
1992	7,754	18,253	76,215	124,583	23,177	36,938	178,693	271,900	9,064	22,829	43,979	159,189	4,682	11,936	34,249	75,922
1993	2,198	10,054	12,272	113,956	6,302	16,821	26,712	226,119	148	116	1,912	171,208	66	12	1,822	75,047
1994	1,589	8,071	27,823	87,428	13,678	34,512	163,087	283,129	634	4,863	55,284	226,100	300	1,916	23,232	93,739
1995	4,917	19,129	111,404	63,421	12,966	27,055	257,166	175,531	8,336	29,131	153,619	164,763	1,835	14,711	66,061	51,554
1996	237	1,851	9,651	100,608	4,161	15,969	117,496	393,330	2,064	12,619	57,533	323,751	510	2,965	18,147	112,442

[a] Prior to June 25, gillnet mesh size was unrestricted in both statistical areas; after June 25, gillnet mesh size was restricted to 6 inches or less. Commerical fishing chum season was allowed only in 335-11, both stat. areas were open during coho season.

[b] Through 1987, stat. area 335-11 was located downstream of Bethel, and 335-12 was located upstream from Bethel to Mishevak Slough.

[c] Since 1985, gillnets have been restricted to 6 inches or less during all commecial periods.

[d] The upstream boundary of District 1 was moved upstream to Bogus Cr.; the area from the old boundary to Bogus Cr. was designated as stat. area 335-13.

[e] Beginning in 1990, the upstream boundary of District 1 was moved downstream to Nelson Is. and the district was split into four stat. areas. Stat. areas 335-11 & -12 are below Bethel, and 335-13 & -14 are above Bethel.

Appendix B.17. Lower Kuskokwim River, District 1, commercial effort, 1970-1996.

Year	Unrestricted Mesh Season	Restricted Mesh Season	Coho Salmon Season	Total
1970	361	a	266	387
1971	418	216	83	422
1972	405	176	245	425
1973	456	341	411	530
1974	606	467	516	666
1975	472	540	533	737
1976	561	517	516	674
1977	563	522	572	653
1978	615	617	597	723
1979	591	617	613	685
1980	553	579	586	663
1981	589	613	586	679
1982	610	576	596	686
1983	544	619	577	679
1984	520	587	619	654
1985	b	598	627	654
1986	b	631	663	688
1987	b	680	694	703
1988	b	c	c	746

Number of Permits Landing Each Species

	Chinook	Sockeye	Coho	Pink	Chum	Roe	Total
1989	695	688	732	261	719	22	745
1990	724	722	714	526	736	1	744
1991	687	705	731	159	733	1	749
1992	711	706	706	520	722	0	741
1993	669	654	717	54	715	0	740
1994	651	666	682	664	700	0	706
1995	684	692	680	80	699	0	712
1996	482	514	615	196	593	17	620
Ten Year Average (1986-1995)							727

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

Appendix B.18. Middle Kuskokwim River, District 2, commercial effort 1970-1996.

Year	Unrestricted Mesh Season	Restricted Mesh Season	Coho Salmon Season	Total
1970	10	a	11	18
1971	22	a	a	22
1972	12	a	a	12
1973	28	a	a	28
1974	36	a	16	37
1975	38	a	a	38
1976	55	a	11	57
1977	83	54	24	105
1978	28	a	16	43
1979	41	a	20	43
1980	37	21	12	43
1981	153	11	16	153
1982	38	50	25	60
1983	14	42	9	43
1984	15	49	32	58
1985	b	17	16	23
1986	b	21	35	43
1987	b	24	20	29
1988	b	19	21	29

	Number of Permits Landing Each Species						
	Chinook	Sockeye	Coho	Pink	Chum	Roe	Total
1989	20	19	29	8	26	2	30
1990	19	19	21	13	20	0	22
1991	20	20	22	9	22	0	23
1992	18	18	22	3	21	0	22
1993	10	4	20	0	19	0	20
1994	5	3	20	7	20	0	20
1995	18	19	15	0	20	0	21
1996	6	3	8	0	6	6	8
Ten Year Average (1986-1995)							26

a No commercial salmon season.
b No unrestricted mesh season.

Appendix B.19. Estimated salmon escapement at the George River weir, 1996.

Date	Daily Passage					Cumulative Passage					Percent Passage				
	Chinook	Sockeye	Chum	Pink	Coho	Chinook	Sockeye	Chum	Pink	Coho	Chinook	Sockeye	Chum	Pink	Coho
6/21	27	0	65	0	0	27	0	65	0	0	0	0	0	0	0
6/22	17	0	613	0	0	44	0	678	0	0	1	0	4	0	0
6/23	269	0	1,314	0	0	313	0	1,992	0	0	4	0	11	0	0
6/24	762	0	692	0	0	1,075	0	2,684	0	0	14	0	15	0	0
6/25	214	0	49	0	0	1,289	0	2,733	0	0	17	0	16	0	0
6/26	41	5	376	0	0	1,330	5	3,109	0	0	18	5	18	0	0
6/27	183	2	508	0	0	1,513	7	3,617	0	0	20	7	21	0	0
6/28	98	1	167	0	0	1,611	8	3,784	0	0	22	8	22	0	0
6/29	91	3	191	0	0	1,702	11	3,975	0	0	23	11	23	0	0
6/30	84	4	215	0	0	1,786	15	4,190	0	0	24	15	24	0	0
7/01	1,034	1	498	0	0	2,820	16	4,688	0	0	38	16	27	0	0
7/02	712	10	730	1	0	3,532	25	5,418	1	0	47	26	31	0	0
7/03	389	18	961	1	0	3,921	43	6,379	2	0	52	44	36	0	0
7/04	320	8	1,074	0	0	4,241	51	7,453	2	0	57	52	42	0	0
7/05	280	6	326	2	0	4,521	57	7,779	4	0	60	58	44	1	0
7/06	579	9	606	1	0	5,100	66	8,385	5	0	68	67	48	1	0
7/07	180	3	575	0	0	5,280	69	8,960	5	0	71	70	51	1	0
7/08	122	0	629	0	0	5,402	69	9,589	5	0	72	70	55	1	0
7/09	436	15	852	12	0	5,838	84	10,441	17	0	78	86	59	3	0
7/10	127	0	241	0	0	5,965	84	10,682	17	0	80	86	61	3	0
7/11	376	0	446	0	0	6,341	84	11,128	17	0	85	86	63	3	0
7/12	53	4	343	4	0	6,394	88	11,471	21	0	85	90	65	3	0
7/13	60	2	394	9	0	6,454	90	11,865	30	0	86	92	68	5	0
7/14	127	0	489	11	0	6,581	90	12,354	41	0	88	92	70	6	0
7/15	324	0	556	34	0	6,905	90	12,910	75	0	92	92	73	12	0
7/16	78	1	232	18	1	6,983	91	13,142	93	1	93	93	75	14	1
7/17	67	0	462	34	0	7,050	91	13,604	127	1	94	93	77	20	1
7/18	107	0	514	44	0	7,157	91	14,118	171	1	96	93	80	27	1
7/19	63	3	667	90	1	7,220	94	14,785	261	2	96	96	84	41	1
7/20	49	0	322	68	3	7,269	94	15,107	329	5	97	96	86	51	3
7/21	58	0	387	61	0	7,327	94	15,494	390	5	98	96	88	61	3
7/22	26	0	273	45	0	7,353	94	15,767	435	5	98	96	90	68	3
7/23	29	2	321	39	6	7,382	96	16,088	474	11	99	98	92	74	6
7/24	54	0	525	68	22	7,436	96	16,613	542	33	99	98	95	84	19
7/25	34	2	449	74	47	7,470	98	17,062	616	80	100	100	97	96	46
7/26	17	0	508	28	93	7,487	98	17,570	644	173	100	100	100	100	100

Appendix B.20. Estimated salmon escapement at Takotna River tower.

Date	Chinook Passage						Chum Passage					
	Daily		Cumulative		Percent		Daily		Cumulative		Percent	
	1995 [a]	1996	1995 [a]	1996	1995 [a]	1996	1995 [a]	1996	1995 [a]	1996	1995 [a]	1996
6/15		0		0		0		0		0		0
6/16		0		0		0		0		0		0
6/17		0		0		0		0		0		0
6/18		0		0		0		0		0		0
6/19		0		0		0		0		0		0
6/20		0		0		0		0		0		0
6/21		0		0		0		14		14		0
6/22		0		0		0		0		14		0
6/23		0		0		0		0		14		0
6/24		0		0		0		102		116		4
6/25		0		0		0		0		116		4
6/26		9		9		2		0		116		4
6/27		17		26		6		137		253		9
6/28		8		34		8		58		311		11
6/29		21		55		14		127		438		16
6/30		18		73		18		117		555		20
7/01		15		88		22		101		656		23
7/02		12		100		25		85		741		26
7/03		12		112		28		89		830		30
7/04		73		185		46		123		953		34
7/05		39		224		56		264		1,217		43
7/06		10		234		58		295		1,512		54
7/07		37		271		67	0	242	0	1,754		63
7/08		24		295		73	53	209	53	1,963		70
7/09		3		298		74	18	172	71	2,135		76
7/10		4		302		75	222	105	293	2,240		80
7/11		5		307		76	63	88	356	2,328		83
7/12		5		312		78	42	78	398	2,406		86
7/13		7		319		79	98	70	496	2,476		88
7/14		7		326		81	117	11	613	2,487		89
7/15		9		335		83	82	28	695	2,515		90
7/16		0		335		83	126	37	821	2,552		91
7/17		20		355		88	11	58	832	2,610		93
7/18		11		366		91	150	53	982	2,663		95
7/19		9		375		93	189	35	1,171	2,698		96
7/20		8		383		95	42	29	1,213	2,727		97
7/21		7		390		97	129	26	1,342	2,753		98
7/22		5		395		98	72	21	1,414	2,774		99
7/23		4		399		99	79	15	1,493	2,789		99
7/24		3		402		100	8	6	1,501	2,795		100
7/25		0		402		100	18	11	1,519	2,806		100
7/26		0		402		100	11	0	1,530	2,806		100
7/27							33		1,563			
7/28							21		1,584			
7/29							29		1,613			
7/30							66		1,679			
7/31							6		1,685			

[a] Operational period was insufficient to estimate daily or season passage.

APPENDIX C

Appendix C.1. Quinhagak District commercial effort 1970-1996.

YEAR	NUMBER OF PERIODS	PERMIT HOURS[a]	EFFORT[b]
1970	14	1494	88
1971	6	630	61
1972	16	192	107
1973	28	504	109
1974	30	360	196
1975	24	288	127
1976	27	324	181
1977	27	324	258
1978	37	444	200
1979	36	432	206
1980	36	432	169
1981	33	396	186
1982	34	408	117
1983	28	318	226
1984	33	396	263
1985	23	276	300
1986	29	348	324
1987	19	216	310
1988	32	384	288
1989	29	348	227
1990	30	444	390
1991	31	372	346
1992	34	420	349
1993	32	384	409
1994	32	384	308
1995	35	414	382
1996	27	298	218
Ten Year Average (1986-95)	30	371	333

a Number of permits times period length (hours) for each period summed over all periods.
b Permits that made at least one delivery during the year.

Appendix C.2. Quinhagak District commercial salmon harvest, 1960-1996.

YEAR	CHINOOK	SOCKEYE	COHO	PINK	CHUM	TOTAL
1960	0	5,649	3,000	0	0	8,649
1961	4,328	2,308	46	90	18,864	25,636
1962	5,526	10,313	0	4,340	45,707	65,886
1963	6,555	0	0	0	0	6,555
1964	4,081	13,422	379	939	707	19,528
1965	2,976	1,886	0	0	4,242	9,104
1966	278	1,030	0	268	2,610	4,186
1967	0	652	1926	0	8,087	10,665
1968	8,879	5,884	21,511	75,818	19,497	131,589
1969	16,802	3,784	15,077	953	38,206	74,822
1970	18,269	5,393	16,850	15,195	46,556	102,263
1971	4,185	3,118	2,982	13	30,208	40,506
1972	15,880	3,286	376	1,878	17,247	38,667
1973	14,993	2,783	16,515	277	19,680	54,248
1974	8,704	19,510	10,979	43,642	15,298	89,429
1975	3,928	8,584	10,742	486	35,233	58,973
1976	14,110	6,090	13,777	31,412	43,659	109,048
1977	19,090	5,519	9,028	202	43,707	77,546
1978	12,335	7,589	20,114	47,033	24,798	111,869
1979	11,144	18,828	47,525	295	25,995	103,787
1980	10,387	13,221	62,610	21,671	65,984	173,873
1981	24,524	17,292	47,551	160	53,334	142,861
1982	22,106	25,685	73,652	11,838	34,346	167,627
1983	46,385	10,263	32,442	168	23,090	112,348
1984	33,663	17,255	132,151	16,249	50,422	249,740
1985	30,401	7,876	29,992	28	20,418	88,715
1986	22,835	21,484	57,544	8,700	29,700	140,263
1987	26,022	6,489	50,070	66	8,557	91,204
1988	13,883	21,556	68,605	21,310	29,220	154.574
1989	20,820	20,582	44,607	273	39,395	125,677
1990	27,644	83,681	26,926	12,056	47,717	198,024
1991	9,480	53,657	42,571	115	54,493	160,316
1992	17,197	60,929	86,404	64,217	73,383	302,130
1993	15,784	80,934	55,817	7	40,943	193,485
1994	8,564	72,314	83,912	35,904	61,301	261,995
1995	38,584	68,194	66,203	186	81,462	254,629
1996	14,165	57,665	118,718	20	83,005[b]	273,573
Ten Year Average (86-95)	20,081	48,982	58,266	129[a]	46,617	188,230

a Average of odd years only
b Estimate of chum roe included

Appendix C.3. Kanektok River peak aerial surveys by species, 1962-1996[a].

Year	SPECIES			
	Chinook	Sockeye	Coho	Chum
1962	935	43,108		
1963				
1964				
1965				
1966	3,718			28,800
1967				
1968	4,170	8,000		14,000
1969				
1970	4,112	3,028		80,100
1971				
1972				
1973	814			
1974				
1975		6,018		
1976		2,936		8,697
1977	5,787	6,304		32,157
1978[b]	19,180	44,215		229,290
1979				
1980	6,172	113,931	69,325	23,950
1981[c]	15,900	49,175		71,840
1982[d]	8,142	55,940		
1983	8,890	2,340		9,360
1984[e]	12,182	30,840	46,830	48,360
1985	13,465	16,270		14,385
1986	3,643	14,949		16,790
1987	4,223	51,753	20,056	9,420
1988	11,140	30,440		20,063
1989	7,914	14,735		6,270
1990	2,563	32,082		2,475
1991[d]	2,100	43,500	4,330	18,000
1992[f]	3,856	14,955		25,675
1993	4,670	23,128		1,285
1994[g]	7,386	30,090		10,000
1995[h]			2,250	16,272
1996[g]	6,107	30,000	23,656	7,040
10 YR AVG:	6,096	27,190		12,625
OBJECTIVE:	5,000	15,000		30,500

a Peak aerial surveys are those rated fair or good surveys obtained between 20 July and 5 August for chinook and sockeye salmon, 20-31 July for chum salmon, and 20 August and 5 September for coho salmon. Some surveys which do not meet these criteria may be referenced in this table; text are footnoted.

b Chum salmon count excluded from escapement objective calculation due to exceptional magnitude.

c Poor survey for chinook, sockeye, chum salmon.

d Late survey for chinook, sockeye salmon (after 5 August).

e Poor coho survey.

f Some chum may have been sockeye.

g Chum count not at peak, estimate made during chinook survey.

h Partial survey rated poor.

Appendix C.4. Summary of historical commercial harvest by date, Quinhagak District, chinook salmon, 1981-1996.

Date	No. Years w/ fishing period on this date	Minimum harvest	Maximum harvest	Median harvest	Cumulative proportion harvest
12-Jun	1	0	0	0	0
13-Jun	4	33	7,720	4,669	0.0459
14-Jun	2	0	5,080	2,540	0.0596
15-Jun	4	1,165	3,914	3,182	0.0903
16-Jun	4	0	7,835	590	0.1146
17-Jun	2	3,527	8,190	5,859	0.1461
18-Jun	5	1,942	11,997	6,694	0.2347
19-Jun	2	3,525	5,801	4,663	0.2598
20-Jun	5	746	7,341	3,031	0.3096
21-Jun	4	4,268	6,194	4,976	0.3644
22-Jun	3	4,002	10,586	4,752	0.4164
23-Jun	3	2,039	11,652	6,276	0.4701
24-Jun	6	1,403	6,698	4,102	0.5367
25-Jun	5	2,125	4,539	3,719	0.5831
26-Jun	3	1,506	1,741	1,703	0.5964
27-Jun	3	1,849	9,711	3,795	0.6376
28-Jun	4	1,438	4,089	2,528	0.6661
29-Jun	4	0	2,378	1,872	0.6825
30-Jun	4	690	4,496	1,229	0.7031
01-Jul	4	657	3,752	2,211	0.7268
02-Jul	6	1,105	3,602	1,872	0.7579
03-Jul	6	1,096	2,771	1,903	0.7887
04-Jul	4	508	4,068	1,782	0.8106
05-Jul	7	611	2,710	967	0.8329
06-Jul	5	273	1,008	692	0.8425
07-Jul	7	620	1,566	1,228	0.8642
08-Jul	5	465	2,407	756	0.8782
09-Jul	6	441	1,259	769	0.8907
10-Jul	4	334	804	691	0.8975
11-Jul	8	393	1,545	797	0.9160
12-Jul	4	306	687	483	0.9212
13-Jul	7	205	1,011	419	0.9308
14-Jul	7	220	1,351	438	0.9416
15-Jul	6	230	1,306	342	0.9517
16-Jul	4	220	533	421	0.9559
17-Jul	6	130	290	219	0.9596
18-Jul	5	187	845	260	0.9648
19-Jul	5	97	792	140	0.9689
20-Jul	5	89	490	159	0.9724
21-Jul	6	90	248	162	0.9750
22-Jul	5	35	629	131	0.9779
23-Jul	5	0	324	88	0.9798
24-Jul	6	33	187	94	0.9815

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Appendix C. 4. (page 2 of 2)

Date	No. Years w/ fishing period on this date	Minimum harvest	Maximum harvest	Median harvest	Cumulative proportion harvest
25-Jul	5	0	379	116	0.9835
26-Jul	4	0	71	35	0.9838
27-Jul	9	0	194	88	0.9860
28-Jul	3	31	63	56	0.9864
29-Jul	7	21	116	64	0.9877
30-Jul	4	49	111	89	0.9886
31-Jul	7	0	54	35	0.9892
01-Aug	6	51	153	70	0.9905
02-Aug	6	14	53	37	0.9910
03-Aug	8	16	160	47	0.9923
04-Aug	3	0	37	30	0.9925
05-Aug	9	6	141	32	0.9936
06-Aug	6	19	78	32	0.9942
07-Aug	5	15	49	27	0.9946
08-Aug	7	0	71	15	0.9951
09-Aug	6	6	36	12	0.9954
10-Aug	7	0	125	28	0.9962
11-Aug	5	6	31	15	0.9964
12-Aug	7	12	74	24	0.9970
13-Aug	5	0	36	16	0.9972
14-Aug	7	6	29	12	0.9975
15-Aug	5	2	43	28	0.9978
16-Aug	8	1	16	8	0.9980
17-Aug	7	1	66	15	0.9984
18-Aug	6	7	12	10	0.9985
19-Aug	9	3	51	10	0.9989
20-Aug	5	6	16	7	0.9990
21-Aug	8	4	13	6	0.9991
22-Aug	5	3	33	6	0.9993
23-Aug	8	1	11	5	0.9994
24-Aug	6	1	14	4	0.9995
25-Aug	7	0	16	4	0.9996
26-Aug	8	1	17	6	0.9997
27-Aug	4	3	4	3	0.9997
28-Aug	6	2	8	4	0.9998
29-Aug	7	0	7	2	0.9998
30-Aug	3	0	9	1	0.9999
21-Aug	7	0	3	1	0.9999
01-Sep	6	0	10	1	0.9999
02-Sep	7	0	4	1	1.0000
03-Sep	4	0	2	1	1.0000
04-Sep	5	0	2	2	1.0000
05-Sep	7	0	2	1	1.0000
06-Sep	5	0	1	0	1.0000
07-Sep	7	0	0	0	1.0000
08-Sep	3	0	0	0	1.0000
09-Sep	1	0	0	0	1.0000

Appendix C.5. Summary of historical commercial harvest by date, Quinhagak District, sockeye salmon, 1981-1996.

Date	No. Years w/ fishing period on this date	Minimum harvest	Maximum harvest	Median harvest	Cumulative proportion harvest
12-Jun	1	0	0	0	0
13-Jun	4	4	151	35	0.0004
14-Jun	2	0	384	192	0.0010
15-Jun	4	62	440	112	0.0021
16-Jun	4	0	277	75	0.0028
17-Jun	2	356	1,119	738	0.0052
18-Jun	5	355	574	462	0.0088
19-Jun	2	171	741	456	0.0103
20-Jun	5	111	485	367	0.0128
21-Jun	4	1,039	2,322	1,739	0.0237
22-Jun	3	379	1,146	746	0.0273
23-Jun	3	343	1,741	1,371	0.0329
24-Jun	6	638	3,271	1,818	0.0527
25-Jun	5	732	3,043	1,640	0.0661
26-Jun	3	805	2,300	1,717	0.0738
27-Jun	3	461	4,923	543	0.0832
28-Jun	4	1,908	10,941	2,190	0.1108
29-Jun	4	0	6,304	4,353	0.1347
30-Jun	4	1,360	7,574	2,348	0.1565
01-Jul	4	975	8,625	5,005	0.1879
02-Jul	6	1,242	5,654	2,649	0.2182
03-Jul	6	2,244	7,045	3,580	0.2569
04-Jul	4	627	5,743	3,378	0.2779
05-Jul	7	1,157	15,375	2,934	0.3328
06-Jul	5	1,126	8,381	6,045	0.3748
07-Jul	7	1,211	8,326	3,837	0.4189
08-Jul	5	1,289	9,304	4,001	0.4592
09-Jul	6	1,532	9,824	5,181	0.5099
10-Jul	4	2,229	9,894	5,185	0.5459
11-Jul	8	1,901	7,672	4,585	0.6051
12-Jul	4	1,468	6,827	4,149	0.6316
13-Jul	7	1,842	13,450	5,707	0.7038
14-Jul	7	878	7,490	3,134	0.7417
15-Jul	6	1,240	6,687	4,634	0.7826
16-Jul	4	564	8,537	2,251	0.8043
17-Jul	6	937	5,203	3,514	0.8360
18-Jul	5	657	5,842	1,321	0.8519
19-Jul	5	866	12,850	2,391	0.8856
20-Jul	5	477	4,611	1,722	0.9030
21-Jul	6	477	2,523	879	0.9139
22-Jul	5	799	3,537	1,298	0.9267
23-Jul	5	0	4,361	361	0.9359
24-Jul	6	215	2,610	926	0.9461

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Date	No. Years w/ fishing period on this date	Minimum harvest	Maximum harvest	Median harvest	Cumulative proportion harvest
25-Jul	5	0	2,681	393	0.9540
26-Jul	4	0	1,404	462	0.9577
27-Jul	9	0	2,096	253	0.9662
28-Jul	3	102	879	363	0.9684
29-Jul	7	126	997	429	0.9733
30-Jul	4	19	1,516	246	0.9766
31-Jul	7	1	730	210	0.9796
01-Aug	6	42	757	143	0.9820
02-Aug	6	38	583	116	0.9839
03-Aug	8	30	408	132	0.9862
04-Aug	3	3	387	93	0.9869
05-Aug	9	6	333	150	0.9890
06-Aug	6	16	254	91	0.9901
07-Aug	5	30	481	128	0.9917
08-Aug	7	0	198	42	0.9924
09-Aug	6	6	307	75	0.9934
10-Aug	7	10	77	20	0.9937
11-Aug	5	6	192	28	0.9943
12-Aug	7	1	125	64	0.9951
13-Aug	5	0	89	19	0.9953
14-Aug	7	1	194	34	0.9961
15-Aug	5	12	42	31	0.9963
16-Aug	8	0	133	28	0.9968
17-Aug	7	1	71	18	0.9971
18-Aug	6	6	146	19	0.9975
19-Aug	9	2	48	13	0.9977
20-Aug	5	3	42	27	0.9979
21-Aug	8	0	139	23	0.9984
22-Aug	5	1	32	6	0.9985
23-Aug	8	1	102	15	0.9989
24-Aug	6	0	18	2	0.9989
25-Aug	7	0	114	7	0.9992
26-Aug	8	0	33	9	0.9993
27-Aug	4	0	30	5	0.9994
28-Aug	6	0	68	6	0.9996
29-Aug	7	0	11	6	0.9996
30-Aug	3	0	58	0	0.9997
21-Aug	7	0	20	4	0.9998
01-Sep	6	0	32	3	0.9998
02-Sep	7	0	14	4	0.9999
03-Sep	4	0	8	1	0.9999
04-Sep	5	0	18	1	1.0000
05-Sep	7	0	16	0	1.0000
06-Sep	5	0	1	0	1.0000
07-Sep	7	0	5	0	1.0000
08-Sep	3	0	3	0	1.0000
09-Sep	1	0	0	0	1.0000

Appendix C.6. Summary of historical commercial harvest by date, Quinhagak District, coho salmon, 1981-1996.

Date	No. Years w/ fishing period on this date	Minimum harvest	Maximum harvest	Median harvest	Cumulative proportion harvest
12-Jun	1	0	0	0	0
13-Jun	4	0	0	0	0
14-Jun	2	0	0	0	0
15-Jun	3	0	0	0	0.0000
16-Jun	4	0	0	0	0.0000
17-Jun	2	0	0	0	0.0000
18-Jun	5	0	0	0	0.0000
19-Jun	2	0	0	0	0.0000
20-Jun	5	0	0	0	0.0000
21-Jun	4	0	0	0	0.0000
22-Jun	3	0	0	0	0.0000
23-Jun	3	0	0	0	0.0000
24-Jun	6	0	0	0	0.0000
25-Jun	5	0	0	0	0.0000
26-Jun	3	0	0	0	0.0000
27-Jun	3	0	0	0	0.0000
28-Jun	4	0	0	0	0.0000
29-Jun	4	0	0	0	0.0000
30-Jun	4	0	2	0	0.0000
01-Jul	3	0	0	0	0.0000
02-Jul	6	0	1	0	0.0000
03-Jul	6	0	0	0	0.0000
04-Jul	3	0	0	0	0.0000
05-Jul	7	0	0	0	0.0000
06-Jul	4	0	0	0	0.0000
07-Jul	7	0	0	0	0.0000
08-Jul	4	0	0	0	0.0000
09-Jul	6	0	39	0	0.0000
10-Jul	4	0	5	0	0.0001
11-Jul	8	0	9	0	0.0001
12-Jul	4	0	2	0	0.0001
13-Jul	7	0	3	0	0.0001
14-Jul	7	0	2	0	0.0001
15-Jul	6	0	24	11	0.0002
16-Jul	4	1	39	9	0.0003
17-Jul	6	0	251	8	0.0005
18-Jul	5	1	234	19	0.0008
19-Jul	5	2	88	11	0.0010
20-Jul	5	3	787	75	0.0022
21-Jul	6	7	366	72	0.0029
22-Jul	5	1	250	12	0.0033
23-Jul	5	0	1,386	96	0.0051
24-Jul	6	21	2,295	78	0.0080

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Date	No. Years w/ fishing period on this date	Minimum harvest	Maximum harvest	Median harvest	Cumulative proportion harvest
25-Jul	5	0	3,482	519	0.0125
26-Jul	4	0	122	99	0.0129
27-Jul	9	0	5,512	273	0.0245
28-Jul	3	294	1,214	390	0.0264
29-Jul	7	152	7,989	565	0.0377
30-Jul	4	535	3,079	1,651	0.0445
31-Jul	7	146	5,597	925	0.0539
01-Aug	6	392	5,680	1,113	0.0651
02-Aug	6	390	12,478	2,298	0.0869
03-Aug	8	592	5,390	1,067	0.1007
04-Aug	3	190	4,293	1,755	0.1068
05-Aug	9	387	19,091	2,987	0.1443
06-Aug	6	2,068	8,436	4,278	0.1720
07-Aug	5	693	8,188	5,243	0.1981
08-Aug	7	0	19,215	2,991	0.2409
09-Aug	6	1,831	11,553	5,486	0.2774
10-Aug	7	1,237	9,428	5,430	0.3172
11-Aug	5	4,686	10,076	6,800	0.3511
12-Aug	6	2,710	10,458	3,362	0.3846
13-Aug	5	1,561	10,961	6,165	0.4147
14-Aug	7	1,671	783	3,543	0.4436
15-Aug	5	1,603	15,733	10,609	0.4899
16-Aug	8	1,403	8,299	3,923	0.5236
17-Aug	7	2,008	9,897	5,253	0.5633
18-Aug	6	1,008	9,776	7,511	0.6038
19-Aug	9	2,532	12,931	4,679	0.6549
20-Aug	5	3,958	8,728	529	0.6835
21-Aug	8	2,110	7,631	3,489	0.7146
22-Aug	5	2,515	8,437	4,662	0.7394
23-Aug	8	2,400	11,957	4,528	0.7826
24-Aug	6	2,790	8,673	4,565	0.8124
25-Aug	7	115	5,308	3,174	0.8320
26-Aug	8	1,419	6,505	4,635	0.8652
27-Aug	4	1,431	5,975	3,687	0.8797
28-Aug	6	1,514	4,684	397	0.9008
29-Aug	7	0	3,623	2,701	0.9177
30-Aug	3	1,054	9,431	2,193	0.9302
21-Aug	7	1,427	7,145	2,340	0.9504
01-Sep	6	0	2,565	1,739	0.9599
02-Sep	7	535	4,065	160	0.9724
03-Sep	4	0	2,777	1,659	0.9784
04-Sep	5	0	2,058	1,177	0.9844
05-Sep	7	0	3,799	901	0.9922
06-Sep	5	0	1,769	0	0.9951
07-Sep	7	0	1,798	0	0.9988
08-Sep	3	0	1,262	0	1.0000
09-Sep	1	0	0	0	1.0000

Appendix C.7 Summary of historical commercial harvest by date, Quinhagak District, chum salmon, 1981-1996.

Date	No. Years w/ fishing period on this date	Minimum harvest	Maximum harvest	Median harvest	Cumulative proportion harvest
12-Jun	1	0	0	0	0
13-Jun	4	14	1,092	133	0.0019
14-Jun	2	0	2,125	1,063	0.0048
15-Jun	4	252	2,821	1,065	0.0119
16-Jun	4	0	847	394	0.0142
17-Jun	2	1,556	1,916	1,736	0.0189
18-Jun	5	1,162	2,611	1,629	0.0310
19-Jun	2	1,198	1,913	1,556	0.0353
20-Jun	5	287	2,760	746	0.0426
21-Jun	4	868	4,471	2,214	0.0560
22-Jun	3	1,051	6,984	2,177	0.0700
23-Jun	3	1,103	3,226	1,774	0.0784
24-Jun	6	732	5,990	2,316	0.1029
25-Jun	5	1,711	6,662	3,606	0.1299
26-Jun	3	1,529	4,329	2,851	0.1419
27-Jun	3	1,855	2,722	1,874	0.1507
28-Jun	4	2,458	5,449	3,951	0.1724
29-Jun	4	0	8,441	6,449	0.2016
30-Jun	4	2,066	4,903	3,181	0.2199
01-Jul	4	1,836	13,544	6,427	0.2586
02-Jul	6	1,972	6,034	3,919	0.2911
03-Jul	6	1,788	10,073	4,734	0.3321
04-Jul	4	2,333	3,155	2,866	0.3475
05-Jul	7	1,820	7,481	4,168	0.3897
06-Jul	5	2,192	8,484	4,094	0.4240
07-Jul	7	2,939	7,138	3,708	0.4608
08-Jul	5	3,050	8,296	3,672	0.4946
09-Jul	6	3,518	8,768	4,728	0.5398
10-Jul	4	4,022	5,667	4,998	0.5668
11-Jul	8	2,313	9,329	3,767	0.6179
12-Jul	4	3,211	9,074	3,803	0.6452
13-Jul	7	270	9,794	4,882	0.7014
14-Jul	7	732	5,381	2,084	0.7290
15-Jul	6	2,796	10,756	6,179	0.7817
16-Jul	4	1,784	3,369	2,159	0.7947
17-Jul	6	2,326	8,308	4,018	0.8329
18-Jul	5	1,310	4,343	3,022	0.8523
19-Jul	5	1,577	4,960	3,184	0.8744
20-Jul	5	2,127	4,684	3,355	0.8968
21-Jul	6	1,143	2,086	1,804	0.9107
22-Jul	5	990	2,696	1,812	0.9236
23-Jul	5	0	1,791	1,316	0.9319
24-Jul	6	499	2,713	1,489	0.9453

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Date	No. Years w/ fishing period on this date	Minimum harvest	Maximum harvest	Median harvest	Cumulative proportion harvest
25-Jul	5	0	21,397	1,053	0.9512
26-Jul	4	0	1,446	941	0.9558
27-Jul	9	0	1,885	677	0.9647
28-Jul	3	33	975	428	0.9671
29-Jul	7	190	1,412	797	0.9741
30-Jul	4	173	802	384	0.9765
31-Jul	7	5	715	468	0.9804
01-Aug	6	246	479	303	0.9832
02-Aug	6	153	459	267	0.9856
03-Aug	8	110	580	234	0.9883
04-Aug	3	4	262	116	0.9889
05-Aug	9	98	357	218	0.9915
06-Aug	6	52	285	147	0.9928
07-Aug	5	89	260	114	0.9938
08-Aug	7	0	234	106	0.9947
09-Aug	6	11	265	105	0.9956
10-Aug	7	9	108	53	0.9962
11-Aug	5	4	110	37	0.9965
12-Aug	7	15	109	51	0.9971
13-Aug	5	2	95	19	0.9973
14-Aug	7	13	166	37	0.9980
15-Aug	5	6	53	28	0.9982
16-Aug	8	2	96	31	0.9986
17-Aug	7	0	50	15	0.9987
18-Aug	6	7	49	9	0.9989
19-Aug	9	5	54	14	0.9991
20-Aug	5	3	27	11	0.9992
21-Aug	8	2	26	10	0.9994
22-Aug	5	1	18	13	0.9994
23-Aug	8	3	27	12	0.9996
24-Aug	6	0	8	4	0.9996
25-Aug	7	0	25	4	0.9997
26-Aug	8	0	15	6	0.9998
27-Aug	4	0	6	2	0.9998
28-Aug	6	2	17	4	0.9998
29-Aug	7	0	3	0	0.9998
30-Aug	3	0	18	1	0.9998
21-Aug	7	0	10	1	0.9999
01-Sep	6	0	8	1	0.9999
02-Sep	7	0	7	1	0.9999
03-Sep	4	0	43	0	1.0000
04-Sep	5	0	13	0	1.0000
05-Sep	7	0	5	0	1.0000
06-Sep	5	0	0	0	1.0000
07-Sep	7	0	2	0	1.0000
08-Sep	3	0	0	0	1.0000
09-Sep	1	0	0	0	1.0000

APPENDIX D

Appendix D.1. Historical estimated salmon run size and commercial exploitation rate, Goodnews River, 1981-1996.

Year	Species	Middle Fork Weir Estimate	Middle Fork Aerial Survey Count as a Percentage of Weir Est.	Goodnews River Escapement Estimate	Goodnews Bay Subsistence Harvest Estimate	Goodnews Bay Commercial Harvest	Total Run Size Estimate	Exploitation[a] Rate (% of Run)
1981	Chinook	3,688	-b	7,766[c]	1,409	7,190	20,053	43%
	Sockeye	49,108	-b	100,029[c]	3,511[d]	40,273	192,921	23%
	Chum	21,827	-b	53,799[c]	-	13,642	89,268	15%
1982	Chinook	1,395	-b	2,937[c]	1,236	9,476	15,044	71%
	Sockeye	56,255	-b	114,587[c]	2,754[d]	38,877	212,473	20%
	Chum	6,767	-b	16,679[c]	-	13,829	37,275	37%
1983	Chinook	6,022	36%	14,398	1,066	14,117	35,603	43%
	Sockeye	25,813	22%	69,955	1,518[d]	11,716	109,002	12%
	Chum	15,548	-b	38,323[c]	-	6,766	60,637	11%
1984	Chinook	3,260	35%	8,743	629	8,612	21,244	43%
	Sockeye	32,053	27%	67,213	964	15,474	115,740	14%
	Chum	19,003	35%	117,739	189	14,340	151,271	10%
1985	Chinook	2,831	70%	7,979	426	5,793	17,029	37%
	Sockeye	24,131	11%	50,481	704	6,698	82,014	9%
	Chum	10,367	32%	25,025	348	4,784	40,524	13%
1986	Chinook	2,092	57%	4,094	555	2,723	9,464	35%
	Sockeye	51,069	28%	93,228	942	25,112	170,351	15%
	Chum	14,764	38%	51,910	191	10,355	77,220	14%
1987	Chinook	2,272	100%	4,490	816	3,357	10,935	38%
	Sockeye	28,871	85%	51,989	955	27,758	109,573	26%
	Chum	17,517	58%	37,802	578	20,381	76,278	27%
1988	Chinook	2,712	39%	5,419	310	4,964	13,405	39%
	Sockeye	15,799	30%	38,319	1065	36,368	91,551	41%
	Chum	20,799	21%	39,501	448	33,059	93,807	36%
1989	Chinook	1,915	67%	2,891	467	2,966	8,239	42%
	Sockeye	21,186	60%	35,476	869	19,299	76,830	26%
	Chum	10,380	28%	15,495	760	13,622	40,257	36%
1990	Chinook	3,636	-b	7,656[c]	682	3,303	15,277	26%
	Sockeye	31,679	-b	64,528[c]	905	35,823	132,935	28%
	Chum	6,410	-b	15,799[c]	342	13,194	35,745	38%
1991[e]	Chinook	1,952	-b	4,521[c]	682	912	8,067	20%
	Sockeye	47,397	-b	96,544[c]	900	39,838	184,679	22%
	Chum	27,525	-b	67,844[c]	106	15,892	111,367	14%
1992	Chinook	1,903	61%	1,854	252	3,528	7,537	50%
	Sockeye	27,268	21%	52,501	905	39,194	119,868	33%
	Chum	22,023	19%	16,084	662	18,520	57,289	33%
1993	Chinook	2,317	-b	4,727[c]	488	2,117	9,649	27%
	Sockeye	26,244	-b	54,325[c]	572	59,293	140,434	43%
	Chum	14,472	-b	38,061[c]	133	10,657	63,323	17%
1994	Chinook	3,856	-b	7,866[c]	657	2,570	14,949	22%
	Sockeye	55,751	-b	115,405[c]	652	69,490	241,298	29%
	Chum	34,849	-b	91,653[c]	402	28,477	155,381	19%
1995	Chinook	4,836	-b	9,865[c]	552	2,922	18,175	19%
	Sockeye	39,009	-b	80,749[c]	787	37,351	157,896	24%
	Chum	33,699	-b	88,628[c]	329	19,832	142,488	14%
1996	Chinook	2,930	-b	5,977[c]	526	1,375	10,808	18%
	Sockeye	58,264	-b	120,606[c]	763	30,717	210, 350	15%
	Chum	40,450	-b	106,384[c]	326	11,093	158,253	7%

a Commercial and subsistence exploitation

b Incomplete aerial survey results

c Average Middle Fork/Goodnews River escapement estimate ratio for 1983-1988 used to estimate Goodnews River escapement in years with no aerial survey data. After 1992, that year is included in the estimate ratio also.

d Subsistence caught chum salmon is included in subsistence sockeye salmon harvest

e Goodnews Tower Project changed to weir project in 1991.

Appendix D.2. Goodnews Bay District commercial effort 1970-1996.

YEAR	NUMBER OF PERIODS	PERMIT HOURS[a]	EFFORT[b]
1970	28	624	35
1971	3	156	16
1972	8	186	14
1973	24	288	21
1974	30	360	49
1975	24	288	50
1976	32	384	40
1977	24	288	34
1978	36	432	35
1979	36	432	30
1980	38	456	48
1981	34	492	48
1982	34	540	48
1983	28	336	79
1984	31	372	77
1985	22	264	69
1986	30	360	86
1987	21	252	69
1988	30	360	125
1989	28	336	88
1990	28	396	82
1991	27	432	72
1992	26	396	111
1993	28	336	114
1994	32	432	116
1995	25	396	118
1996	21	247	53
Ten Year Average (1986-95)	28	370	98

a Number of permits times period length (hours) for each period summed over all periods.
b Permits that made at least one delivery during the year.

Appendix D.3. Goodnews Bay District commercial salmon harvest, 1968-1996.

YEAR	CHINOOK	SOCKEYE	COHO	PINK	CHUM	TOTAL
1968			5,458			5,458
1969	3,978	6,256	11,631	298	5,006	27,169
1970	7,163	7,144	6,794	12,183	12,346	45,630
1971	477	330	1,771	-	301	2,879
1972	264	924	925	66	1,331	3,510
1973	3,543	2,072	5,017	324	15,781	26,737
1974	3,302	9,357	21,340	16,373	8,942	59,314
1975	2,156	9,098	17,889	419	5,904	35,466
1976	4,417	5,575	9,852	8,453	10,354	38,651
1977	3,336	3,723	13,335	29	6,531	26,954
1978	5,218	5,412	13,764	9,103	8,590	42,087
1979	3,204	19,581	42,098	201	9,298	74,382
1980	2,331	28,632	43,256	7,832	11,748	93,799
1981	7,190	40,273	19,749	11	13,642	80,865
1982	9,476	38,877	46,683	4,673	13,829	110,732
1983	14,117	11,716	19,660	-	6,766	52,259
1984	8,612	15,474	71,176	4,711	14,340	114,313
1985	5,793	6,698	16,498	8	4,784	33,781
1986	2,723	25,112	19,378	4,447	10,355	62,015
1987	3,357	27,758	29,057	54	20,381	80,607
1988	4,964	36,368	30,832	5,509	33,059	110,282
1989	2,966	19,299	31,849	82	13,622	67,818
1990	3,303	35,823	7,804	629	13,194	60,753
1991	912	39,838	13,312	29	15,892	69,983
1992	3,528	39,194	19,875	14,310	18,520	95,427
1993	2,117	59,293	20,014	-	10,657	92,081
1994	2,570	69,490	47,499	18,017	28,477	166,053
1995	2,922	37,351	17,875	39	19,832	78,019
1996	1,375	30,717	43,836	22	11,093	87,043
Ten Year Average (86-95)	2,936	38,953	23,750	41[a]	18,399	88,349

a Odd years only

Appendix D.4. Aerial survey results, Goodnews River 1980-1996

Year	Goodnews River and Lake				Middle Fork Goodnews River and Lakes				Total			
	Chinook	Sockeye	Chum	Coho	Chinook	Sockeye	Chum	Coho	Chinook	Sockeye	Chum	Coho
1980	1,228	41,576	1,975		1,164	18,596	3,782		2,392	60,172	5,757	
1981	a	a	a		a	a	a		a	a	a	
1982	1,990	19,160	9,700		1,546	2,327	6,300		3,536	21,487	16,000	
1983	2,600	9,650			2,500	5,900	a		5,241	15,600	a	
1984	3,235	12,807	28,124	43,925	2,568	12,897	9,172		5,803	25,704	53,097	43,925
1985	3,535	4,620	4,415		2,050	6,995	3,593		5,585	11,615	8,008	
1986	1,068	8,960	11,850		1,249	16,990	4,400		2,317	25,950	16,250	
1987	2,234	19,786	12,103	11,122	2,207	24,480	2,805		4,441	44,266	15,588	11,122
1988	637	6,031	3,846		1,024	5,831	5,814		1,661	11,862	9,660	
1989	651	3,605	a		1,277	8,044	2,922		1,928	11,649	2,922	
1990	a	27,689	a		a	1,092	a		a	28,781	a	
1991[b]	127	1,285	365		a	a	a		127	1,285	365	
1992	875	10,397	1,950		1,012	7,200	3,270		1,887	17,597	5,220	
1993	a	a	a	8,802	a	a	a					8,802
1994	a	a	a		a	a	a					
1995	3,314	a	a		a	a	a		3,314			
1996	a	a	a		a	a	a					
Escapement Objective[c]	1,600	15,000	17,000	800	5,000	4,000	2,400	20,000				

a Information not available

b Survey past peak

c Escapement objectives are preliminary and are subject to change as additional data becomes available. Escapement objectives are based on aerial index counts which do not represent total escapement, but do reflect annual spawner abundance trends when made using standard survey methods under acceptable survey conditions.

Appendix D.5. Summary of historical commercial harvest by period, Goodnews Bay District, chinook salmon, 1981-1996.

Date	No. Years w/ fishing period on this date	Minimum harvest	Maximum harvest	Median harvest	Cumulative proportion harvest
12-Jun					
13-Jun	1	1,252	1,252	1,252	0.0165
14-Jun	0				0.0165
15-Jun	1	197	197	197	0.0191
16-Jun	2	251	1,096	674	0.0368
17-Jun	1	362	362	362	0.0416
18-Jun	3	387	1,706	1,158	0.0844
19-Jun	2	296	390	343	0.0935
20-Jun	5	139	2,642	404	0.1487
21-Jun	2	1,298	1,535	1,417	0.1860
22-Jun	2	792	1,591	1,192	0.2174
23-Jun	3	583	1,639	788	0.2570
24-Jun	3	476	988	620	0.2844
25-Jun	4	340	1,896	1,154	0.3443
26-Jun	3	0	416	352	0.3544
27-Jun	4	173	3,944	1,008	0.4352
28-Jun	5	307	1,307	807	0.4872
29-Jun	4	330	921	686	0.5217
30-Jun	5	242	1,551	460	0.5682
01-Jul	2	77	1,156	617	0.5844
02-Jul	7	166	710	318	0.6181
03-Jul	3	156	391	264	0.6288
04-Jul	2	637	2,301	1,469	0.6675
05-Jul	8	95	1,809	290	0.7174
06-Jul	4	100	272	239	0.7286
07-Jul	8	132	1,119	526	0.7846
08-Jul	7	93	495	147	0.8029
09-Jul	5	99	351	143	0.8171
10-Jul	4	156	326	201	0.8287
11-Jul	7	53	408	187	0.8465
12-Jul	4	145	737	320	0.8666
13-Jul	5	66	182	135	0.8744
14-Jul	6	54	514	170	0.8913
15-Jul	6	0	354	108	0.9021
16-Jul	6	54	294	94	0.9118
17-Jul	3	65	210	156	0.9175
18-Jul	6	0	217	65	0.9238
19-Jul	4	33	71	64	0.9269
20-Jul	6	38	192	97	0.9353
21-Jul	5	35	68	53	0.9388
22-Jul	3	19	228	80	0.9431
23-Jul	7	17	97	38	0.9470
24-Jul	4	20	77	39	0.9493

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Date	No. Years w/ fishing period on this date	Minimum harvest	Maximum harvest	Median harvest	Cumulative proportion harvest
25-Jul	7	0	82	30	0.9525
26-Jul	4	0	41	21	0.9536
27-Jul	8	19	122	39	0.9595
28-Jul	4	5	22	22	0.9604
29-Jul	5	15	157	31	0.9638
30-Jul	7	16	73	19	0.9666
31-Jul	4	7	34	19	0.9676
01-Aug	7	0	78	24	0.9705
02-Aug	6	6	27	20	0.9720
03-Aug	8	9	102	21	0.9761
04-Aug	4	6	23	15	0.9769
05-Aug	7	6	54	18	0.9788
06-Aug	6	6	79	10	0.9805
07-Aug	3	15	43	17	0.9815
08-Aug	8	0	60	11	0.9832
09-Aug	4	7	21	15	0.9839
10-Aug	9	5	78	14	0.9866
11-Aug	4	5	20	12	0.9872
12-Aug	6	7	47	23	0.9890
13-Aug	6	0	36	5	0.9899
14-Aug	7	4	41	10	0.9911
15-Aug	5	5	26	14	0.9921
16-Aug	8	0	17	7	0.9929
17-Aug	7	2	22	7	0.9938
18-Aug	5	0	10	8	0.9942
19-Aug	7	3	14	8	0.9949
20-Aug	5	1	12	6	0.9953
21-Aug	8	0	11	5	0.9959
22-Aug	5	3	17	9	0.9964
23-Aug	5	0	9	6	0.9968
24-Aug	6	2	17	4	0.9973
25-Aug	5	0	13	4	0.9977
26-Aug	8	0	8	4	0.9981
27-Aug	5	0	13	3	0.9984
28-Aug	8	0	11	3	0.9988
29-Aug	6	2	9	4	0.9991
30-Aug	4	1	4	2	0.9992
21-Aug	7	0	6	1	0.9994
01-Sep	6	0	7	1	0.9995
02-Sep	6	0	5	2	0.9996
03-Sep	5	0	3	2	0.9997
04-Sep	4	0	6	1	0.9998
05-Sep	6	0	5	1	0.9999
06-Sep	3	0	0	0	0.9999
07-Sep	7	0	1	0	1.0000
08-Sep	4	0	2	0	1.0000
09-Sep	1	0	0		1.0000

Appendix D.6. Summary of historical commercial harvest by period, Goodnews Bay District, sockeye salmon, 1981-1996.

Date	No. Years w/ fishing period on this date	Minimum harvest	Maximum harvest	Median harvest	Cumulative proportion harvest
12-Jun					
13-Jun	1	27	27	27	0.0001
14-Jun	0				0.0001
15-Jun	1	70	70	70	0.0002
16-Jun	2	125	696	411	0.0017
17-Jun	1	744	744	744	0.0031
18-Jun	3	281	596	348	0.0054
19-Jun	2	478	551	515	0.0074
20-Jun	5	102	1,989	523	0.0140
21-Jun	2	967	1,280	1,124	0.0182
22-Jun	2	569	1,074	822	0.0213
23-Jun	3	1,029	2,701	1,466	0.0310
24-Jun	3	596	2,120	1,892	0.0397
25-Jun	4	852	2,087	1,348	0.0503
26-Jun	3	0	1,909	1,719	0.0571
27-Jun	4	685	3,040	1,874	0.0711
28-Jun	5	2,008	4,163	2,932	0.0984
29-Jun	4	1,412	3,323	1,763	0.1140
30-Jun	5	2,037	8,143	5,094	0.1628
01-Jul	2	1,143	3,376	2260	0.1713
02-Jul	7	1,818	8,198	3,021	0.2224
03-Jul	3	1,427	5,510	2,589	0.2403
04-Jul	2	1,598	7,674	4,636	0.2577
05-Jul	8	1,254	5,195	2,854	0.3054
06-Jul	4	2,346	7,886	4,723	0.3423
07-Jul	8	2,057	6,283	3,654	0.3976
08-Jul	7	1,231	6,261	4,362	0.4499
09-Jul	5	2,167	4,518	3,751	0.4835
10-Jul	4	1,759	8,140	3,856	0.5165
11-Jul	7	1,397	3,898	2,851	0.5543
12-Jul	4	1,444	16,753	3,664	0.6022
13-Jul	5	2,046	5,275	4,291	0.6386
14-Jul	6	1,039	4,876	2,759	0.6691
15-Jul	6	0	8,860	2,930	0.7081
16-Jul	6	902	4,969	2,456	0.7376
17-Jul	3	2,978	3,936	3,642	0.7574
18-Jul	6	0	3,049	1,545	0.7737
19-Jul	4	1,683	2,830	2,422	0.7913
20-Jul	6	395	3,852	2,009	0.8143
21-Jul	5	507	2,559	1,318	0.8287
22-Jul	3	614	2,207	2,056	0.8279
23-Jul	7	162	3,966	874	0.8555
24-Jul	4	588	2,458	1,166	0.8656

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Date	No. Years w/ fishing period on this date	Minimum harvest	Maximum harvest	Median harvest	Cumulative proportion harvest
25-Jul	7	0	1,678	532	0.8758
26-Jul	4	0	1,804	908	0.8826
27-Jul	8	166	2,903	768	0.8975
28-Jul	4	278	893	567	0.9018
29-Jul	5	605	1,312	810	0.9104
30-Jul	7	84	1,982	423	0.9202
31-Jul	4	300	803	506	0.9241
01-Aug	7	0	811	271	0.9281
02-Aug	6	204	969	485	0.9343
03-Aug	8	36	975	604	0.9430
04-Aug	4	188	739	199	0.9455
05-Aug	7	94	932	308	0.9516
06-Aug	6	34	498	282	0.9547
07-Aug	3	178	692	686	0.9576
08-Aug	8	0	926	284	0.9625
09-Aug	4	46	485	172	0.9641
10-Aug	9	18	659	286	0.9695
11-Aug	4	0	174	113	0.9702
12-Aug	6	17	564	263	0.9734
13-Aug	6	0	347	158	0.9750
14-Aug	7	4	382	234	0.9780
15-Aug	5	5	422	109	0.9798
16-Aug	8	0	322	110	0.9819
17-Aug	7	4	498	151	0.9842
18-Aug	5	0	318	96	0.9853
19-Aug	7	5	360	117	0.9871
20-Aug	5	0	139	98	0.9878
21-Aug	8	1	373	93	0.9899
22-Aug	5	7	353	104	0.9910
23-Aug	5	0	193	88	0.9918
24-Aug	6	1	244	57	0.9929
25-Aug	5	0	353	36	0.9939
26-Aug	8	0	204	67	0.9948
27-Aug	5	0	148	28	0.9954
28-Aug	8	1	186	62	0.9964
29-Aug	6	1	155	54	0.9971
30-Aug	4	0	171	36	0.9975
21-Aug	7	0	88	51	0.9982
01-Sep	6	0	158	47	0.9988
02-Sep	6	2	69	40	0.9992
03-Sep	5	0	72	21	0.9994
04-Sep	4	0	61	27	0.9997
05-Sep	6	0	61	0	0.9998
06-Sep	3	0	0	0	0.9998
07-Sep	7	0	63	2	1.0000
08-Sep	4	0	0	0	1.0000
09-Sep	1	0	0	0	1.0000

Appendix D.7. Summary of historical commercial harvest by period, Goodnews Bay District, coho salmon, 1981-1996.

Date	No. Years w/ fishing period on this date	Minimum harvest	Maximum harvest	Median harvest	Cumulative proportion harvest
12-Jun	0				
13-Jun	1	0	0	0	0.0000
14-Jun	0				0.0000
15-Jun	1	0	0	0	0.0000
16-Jun	2	0	0	0	0.0000
17-Jun	1	0	0	0	0.0000
18-Jun	3	0	0	0	0.0000
19-Jun	2	0	0	0	0.0000
20-Jun	5	0	0	0	0.0000
21-Jun	2	0	0	0	0.0000
22-Jun	2	0	0	0	0.0000
23-Jun	3	0	0	0	0.0000
24-Jun	3	0	0	0	0.0000
25-Jun	4	0	0	0	0.0000
26-Jun	3	0	0	0	0.0000
27-Jun	4	0	0	0	0.0000
28-Jun	5	0	0	0	0.0000
29-Jun	4	0	0	0	0.0000
30-Jun	5	0	0	0	0.0000
01-Jul	2	0	0	0	0.0000
02-Jul	7	0	0	0	0.0000
03-Jul	3	0	0	0	0.0000
04-Jul	2	0	0	0	0.0000
05-Jul	8	0	0	0	0.0000
06-Jul	4	0	0	0	0.0000
07-Jul	8	0	0	0	0.0000
08-Jul	7	0	0	0	0.0000
09-Jul	5	0	0	0	0.0000
10-Jul	4	0	0	0	0.0000
11-Jul	7	0	0	0	0.0000
12-Jul	4	0	1	0	0.0000
13-Jul	5	0	0	0	0.0000
14-Jul	6	0	1	0	0.0000
15-Jul	6	0	13	0	0.0000
16-Jul	6	0	18	1	0.0001
17-Jul	3	0	0	0	0.0001
18-Jul	6	0	18	0	0.0001
19-Jul	4	0	11	3	0.0002
20-Jul	6	0	111	1	0.0004
21-Jul	5	1	18	7	0.0005
22-Jul	3	0	1	0	0.0005
23-Jul	7	1	195	16	0.0011
24-Jul	4	0	33	5	0.0012

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Date	No. Years w/ fishing period on this date	Minimum harvest	Maximum harvest	Median harvest	Cumulative proportion harvest
25-Jul	7	0	632	80	0.0041
26-Jul	4	0	9	5	0.0041
27-Jul	8	0	1,059	71	0.0086
28-Jul	4	3	153	36	0.0091
29-Jul	5	5	343	35	0.0101
30-Jul	7	28	1,461	209	0.0177
31-Jul	4	24	364	34	0.0187
01-Aug	7	0	2,811	171	0.0266
02-Aug	6	96	1,491	500	0.0350
03-Aug	8	66	3,943	138	0.0478
04-Aug	4	285	949	716	0.0536
05-Aug	7	126	2,069	497	0.0646
06-Aug	6	316	4,275	696	0.0824
07-Aug	3	231	812	520	0.0859
08-Aug	8	357	3,090	1,238	0.1123
09-Aug	4	516	2,240	1,527	0.1251
10-Aug	9	463	4,198	1,340	0.1594
11-Aug	4	1,193	6,065	1,920	0.1838
12-Aug	6	1,225	6,488	1,920	0.2178
13-Aug	6	673	4,852	1,593	0.2454
14-Aug	7	1,325	4,644	2,354	0.2824
15-Aug	5	1,784	5,999	2,338	0.3169
16-Aug	8	462	7,321	2,392	0.3695
17-Aug	7	1,390	6,880	3,002	0.4227
18-Aug	5	1,033	3,864	2,378	0.4475
19-Aug	7	1,394	5,628	3,397	0.5001
20-Aug	5	68	9,590	1,678	0.5341
21-Aug	8	968	4,967	2,034	0.5770
22-Aug	5	1,904	6,731	4,520	0.6251
23-Aug	5	1,308	5,306	3,417	0.6613
24-Aug	6	1,597	5,520	3,636	0.7099
25-Aug	5	1,350	3,590	2,039	0.7360
26-Aug	8	15	3,249	1,976	0.7687
27-Aug	5	1,101	6,625	2,519	0.8016
28-Aug	8	1,016	3,529	1,944	0.8371
29-Aug	6	725	3,402	1,747	0.8620
30-Aug	4	1,483	3,730	1,986	0.8821
21-Aug	7	1,084	3,143	1,698	0.9136
01-Sep	6	604	2,778	1,415	0.9340
02-Sep	6	576	3,233	1,138	0.9535
03-Sep	5	377	2,309	1,167	0.9671
04-Sep	4	374	2,685	1,099	0.9786
05-Sep	6	0	2,202	684	0.9887
06-Sep	3	0	1,715	0	0.9925
07-Sep	7	0	2,310	16	1.0000
08-Sep	4	0	0	0	1.0000
09-Sep	1	0	0	0	1.0000

Appendix D.8. Summary of historical commercial harvest by period, Goodnews Bay District, chum salmon, 1981-1996.

Date	No. Years w/ fishing period on this date	Minimum harvest	Maximum harvest	Median harvest	Cumulative proportion harvest
12-Jun					
13-Jun	1	10	10	10	0.0000
14-Jun	0				0.0000
15-Jun	1	102	102	102	0.0005
16-Jun	2	89	1.091	590	0.0052
17-Jun	1	167	167	167	0.0059
18-Jun	3	194	501	254	0.0097
19-Jun	2	249	557	403	0.0129
20-Jun	5	137	3.501	341	0.0314
21-Jun	2	591	698	645	0.0365
22-Jun	2	708	2.124	1.416	0.0479
23-Jun	3	886	7.833	886	0.0866
24-Jun	3	594	1.188	821	0.0971
25-Jun	4	724	2.351	1.580	0.1222
26-Jun	3	0	1.241	866	0.1307
27-Jun	4	691	2.364	743	0.1489
28-Jun	5	526	8.369	1.605	0.2018
29-Jun	4	425	2.983	1.239	0.2255
30-Jun	5	1.093	2.907	1.627	0.2618
01-Jul	2	710	850	780	0.2681
02-Jul	7	565	3.434	2.208	0.3217
03-Jul	3	1.309	3.074	2.540	0.3495
04-Jul	2	1.626	4.075	2.851	0.3725
05-Jul	8	967	3.193	1.521	0.4244
06-Jul	4	963	4.076	1.776	0.4589
07-Jul	8	1.036	4.478	1.850	0.5254
08-Jul	7	949	2.669	1.837	0.5760
09-Jul	5	1.024	2.503	1.356	0.6060
10-Jul	4	1.346	4.835	1.843	0.6457
11-Jul	7	562	5.830	1.009	0.6956
12-Jul	4	1.057	5.498	1.443	0.7336
13-Jul	5	896	2.288	1.361	0.7639
14-Jul	6	601	2.123	1.196	0.7964
15-Jul	6	0	3.296	1.612	0.8357
16-Jul	6	476	1.360	1.100	0.8594
17-Jul	3	1.532	2.115	2.019	0.8822
18-Jul	6	0	1.191	604	0.8966
19-Jul	4	459	1.470	986	0.9123
20-Jul	6	479	1.265	795	0.9329
21-Jul	5	233	563	440	0.9411
22-Jul	3	307	1.177	362	0.9486
23-Jul	7	35	545	253	0.9566
24-Jul	4	244	874	335	0.9638

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Date	No. Years w/ fishing period on this date	Minimum harvest	Maximum harvest	Median harvest	Cumulative proportion harvest
25-Jul	7	0	281	227	0.9690
26-Jul	4	0	608	172	0.9728
27-Jul	8	58	177	150	0.9773
28-Jul	4	81	93	89	0.9787
29-Jul	5	32	223	166	0.9814
30-Jul	7	28	124	102	0.9839
31-Jul	4	8	121	85	0.9851
01-Aug	7	0	61	55	0.9863
02-Aug	6	47	153	89	0.9885
03-Aug	8	22	105	52	0.9903
04-Aug	4	23	60	33	0.9909
05-Aug	7	21	165	54	0.9926
06-Aug	6	18	41	27	0.9933
07-Aug	3	16	62	21	0.9937
08-Aug	8	0	60	22	0.9944
09-Aug	4	13	63	32	0.9950
10-Aug	9	2	44	17	0.9957
11-Aug	4	10	25	12	0.9960
12-Aug	6	0	50	13	0.9964
13-Aug	6	2	22	7	0.9967
14-Aug	7	3	62	15	0.9973
15-Aug	5	0	23	7	0.9975
16-Aug	8	0	16	9	0.9978
17-Aug	7	0	22	7	0.9980
18-Aug	5	0	9	3	0.9981
19-Aug	7	2	16	5	0.9983
20-Aug	5	0	11	3	0.9984
21-Aug	8	0	127	2	0.9990
22-Aug	5	2	6	4	0.9990
23-Aug	5	0	8	4	0.9991
24-Aug	6	0	8	1	0.9992
25-Aug	5	0	8	3	0.9992
26-Aug	8	0	42	2	0.9995
27-Aug	5	0	5	2	0.9995
28-Aug	8	0	11	1	0.9996
29-Aug	6	0	6	4	0.9997
30-Aug	4	0	2	1	0.9997
21-Aug	7	0	9	1	0.9998
01-Sep	6	0	2	1	0.9998
02-Sep	6	0	10	3	0.9999
03-Sep	5	0	4	0	0.9999
04-Sep	4	0	9	3	0.9999
05-Sep	6	0	4	1	1.0000
06-Sep	3	0	0	0	1.0000
07-Sep	7	0	2	0	1.0000
08-Sep	4	0	0	0	1.0000
09-Sep	1	0	0	0	1.0000

Appendix D.9 Average cumulative estimated escapement and proportion by day for chinook, sockeye and chum salmon, Middle Fork Goodnews River weir, 1981-1996[a]

Date	Chinook		Sockeye		Chum	
	Average Number	Cumulative Proportion	Average Number	Cumulative Proportion	Average Number	Cumulative Proportion
6/11	0	0.0001	0	0.0000	0	0.0000
6/12	0	0.0001	0	0.0000	0	0.0000
6/13	0	0.0001	0	0.0000	0	0.0000
6/14	0	0.0000	0	0.0000	0	0.0000
6/15	0	0.0000	7	0.0002	0	0.0000
6/16	0	0.0000	8	0.0002	0	0.0000
6/17	1	0.0002	10	0.0003	0	0.0000
6/18	1	0.0002	16	0.0005	0	0.0000
6/19	3	0.0010	38	0.0012	0	0.0000
6/20	6	0.0019	58	0.0018	1	0.0000
6/21	12	0.0039	126	0.0040	1	0.0000
6/22	20	0.0063	266	0.0084	18	0.0002
6/23	37	0.0117	552	0.0173	34	0.0002
6/24	69	0.0220	1,052	0.0330	54	0.0010
6/25	107	0.0341	1,729	0.0542	130	0.0045
6/26	147	0.0469	2,390	0.0750	196	0.0082
6/27	207	0.0661	3,507	0.1100	330	0.0147
6/28	253	0.0808	4,657	0.1461	416	0.0178
6/29	311	0.0995	5,539	0.1738	507	0.0225
6/30	394	0.1260	6,481	0.2034	657	0.0299
7/01	523	0.1670	7,671	0.2407	926	0.0435
7/02	600	0.1915	8,853	0.2778	1,168	0.0543
7/03	683	0.2181	9,883	0.3101	1,416	0.0678
7/04	769	0.2455	11,146	0.3498	1,720	0.0849
7/05	885	0.2827	12,852	0.4033	2,068	0.1043
7/06	970	0.3098	14,288	0.4483	2,395	0.1208
7/07	1,087	0.3473	15,847	0.4973	2,761	0.1385
7/08	1,187	0.3793	17,517	0.5497	3,183	0.1573
7/09	1,285	0.4104	19,152	0.6010	3,761	0.1895
7/10	1,421	0.4538	20,791	0.6524	4,607	0.2276
7/11	1,564	0.4997	22,307	0.7000	5,333	0.2655
7/12	1,715	0.5478	23,644	0.7419	6,198	0.3086
7/13	1,829	0.5843	24,719	0.7757	6,884	0.3449
7/14	1,936	0.6184	25,742	0.8078	7,588	0.3813
7/15	2,047	0.6538	26,670	0.8369	8,425	0.4251
7/16	2,151	0.6870	27,518	0.8635	9,462	0.4770
7/17	2,293	0.7323	28,235	0.8860	10,377	0.5235
7/18	2,392	0.7640	28,844	0.9051	11,099	0.5600
7/19	2,467	0.7879	29,409	0.9228	11,682	0.5878

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Date	Chinook Average Number	Chinook Cumulative Proportion	Sockeye Average Number	Sockeye Cumulative Proportion	Chum Average Number	Chum Cumulative Proportion
7/20	2,557	0.8168	29,907	0.9384	12,367	0.6230
7/21	2,629	0.8396	30,306	0.9510	12,966	0.6561
7/22	2,703	0.8633	30,628	0.9611	13,717	0.6941
7/23	2,777	0.8871	30,852	0.9681	14,421	0.7321
7/24	2,851	0.9107	31,056	0.9745	15,023	0.7638
7/25	2,898	0.9256	31,190	0.9787	15,540	0.8735
7/26	2,944	0.9405	31,321	0.9828	16,144	0.8978
7/27	2,973	0.9497	31,415	0.9858	16,536	0.9183
7/28	3,011	0.9618	31,512	0.9888	16,977	0.9406
7/29	3,039	0.9708	31,579	0.9909	17,268	0.9546
7/30	3,063	0.9785	31,638	0.9928	17,519	0.9646
7/31	3,078	0.9833	31,676	0.9939	17,708	0.9726
8/01	3,096	0.9889	31,702	0.9948	17,819	0.9935
8/02	3,102	0.9909	31,723	0.9954	17,913	0.9955
8/03	3,108	0.9928	31,741	0.9960	18,005	0.9979
8/04	3,113	0.9944	31,756	0.9965	18,083	0.9983
8/05	3,116	0.9955	31,770	0.9969	18,131	0.9987
8/06	3,120	0.9967	31,780	0.9972	18,180	0.9990
8/07	3,124	0.9978	31,795	0.9977	18,218	0.9992
8/08	3,126	0.9985	31,806	0.9980	18,243	0.9993
8/09	3,128	0.9991	31,820	0.9985	18,271	0.9995
8/10	3,128	1.0000	31,828	0.9987	18,301	0.9995
8/11	3,129	1.0000	31,834	0.9989	18,314	0.9997
8/12	3,129	1.0000	31,839	0.9991	18,335	0.9997
8/13	3,129	1.0000	31,842	0.9992	18,343	0.9998
8/14	3,129	1.0000	31,845	0.9993	18,348	0.9999
8/15	3,129	1.0000	31,848	0.9993	18,357	1.0000
8/16	3,130	1.0000	31,853	0.9995	18,364	1.0000
8/17	3,130	1.0000	31,854	0.9996	18,372	1.0000
8/18	3,130	1.0000	31,857	0.9996	18,377	1.0000
8/19	3,130	1.0000	31,858	0.9997	18,380	1.0000
8/20	3,130	1.0000	31,860	0.9997	18,384	1.0000
8/21	3,130	1.0000	31,861	0.9998	18,386	1.0000
8/22	3,130	1.0000	31,863	0.9998	18,390	1.0000
8/23	3,130	1.0000	31,863	0.9998	18,392	1.0000
8/24	3,130	1.0000	31,865	0.9999	18,394	1.0000
8/25	3,131	1.0000	31,868	1.0000	18,394	1.0000

a Average for the years 1981-1995 excluding 1986, 1992, and 1996. Early termination of the project in 1986 and high water during the peak in 1992 and 1996 precluded assessment of the entire chinook, sockeye and chum salmon migration. In 1993, this project began to assess coho salmon strength. This project changed from a tower to a weir in 1991.

Appendix D.10. Estimated daily escapement of chinook salmon at the Middle Fork Goodnews River, 1981 - 1996.

Date	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
6/11																
6/12			0													
6/13	0		0													
6/14	0		-5													
6/15	0		0	0												
6/16	0		0	0		0										
6/17	2		0	0		6										
6/18	0		0	0		0										
6/19	4		0	4		6									28	6
6/20	9		5	4		0				20					19	7
6/21	11		16	12		0				60		7			5	11
6/22	10		64	9		0	0			-10		1	12	50.0	17	25
6/23	16	0	186	6		0	0	50		16		0	27	5	39	23
6/24	21	22	118	26		0	0	22		30		1	158	20	71	24
6/25	41	28	106	46		26	0	109		43		1	66	30	85	17
6/26	30	4	55	15		0	4	155		178		0	95	15	69	57
6/27	82	2	21	11	4	79	0	200	142	64		34	26	73	28	37
6/28	92	0	171	51	0	45	8	56	70	135		31	10	18	33	34
6/29	166	0	341	11	11	50	16	49	24	128	1	36	36	101	64	49
6/30	54	0	520	8	10	55	36	176	67	27	12	46	68	211	132	68
7/01	86	0	273	57	8	129	56	251	110	30	60	63	32	683	126	40
7/02	186	3	263	105	38	41	67	102	57	32	4	47	5	54	284	39
7/03	90	2	113	57	32	90	59	93	57	138	78	49	9	3	407	37
7/04	134	23	172	58	60	65	51	89	56	201	53	55	4	18	275	125
7/05	252	44	231	59	87	40	91	84	55	263	80	73	15	131	291	115
7/06	237	11	61	105	132	53	130	68	-7	94	28	53	64	41	171	207
7/07	192	24	656	145	99	67	43	95	82	135	15	75	91	81	151	159
7/08	206	44	147	158	66	57	37	70	26	137	49	57	69	291	77	99
7/09	102	50	102	170	126	38	71	126	33	138	174	6	88	1	40	78
7/10	133	26	198	135	132	87	141	120	39	235	256	16	144	72	105	177
7/11	110	66	205	188	192	78	61	114	101	243	94	20	153	35	446	269
7/12	78	106	282	105	186	64	58	81	114	67	189	87	84	400	160	186
7/13	92	104	263	159	45	86	55	59	131	97	23	86	99	140.8	99	73
7/14	61	49	67	202	45	109	213	24	61	178	3	59	14	135.4	248	71
7/15	142	85	157	124	45	139	132	48	87	163	2	54	19	144.7	213	74
7/16	67	117	130	46	108	79	107	65	105	148	4	64	92	133.5	36	62
7/17	68	96	116	223	141	26	114	49	123	101	150	151	93	165.8	209	87
7/18	69	59	92	70	189	84	120	33	57	114	28	66	169	42	55	59
7/19	76	22	106	40	183	76	85	30	34	138	46	41	31	74	48	49

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Date	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
7/20	81	39	160	100	162	79	49	21	0	74	64	60	179	11	177	60
7/21	26	55	187	113	96	83	48	11	40	37	75	52	39	13	74	89
7/22	48	34	67	136	30	147	69	67	48	40	17	82	60	25	42	46
7/23	68	33	58	159	96	64	45	45	41	43	96	69	32	39	59	91
7/24	85	32	89	43	97	44	73	41	33	99	116	45	49	26	112	47
7/25	50	31	79	62	101		58	37	13	0	44	46	11	46	44	41
7/26	43	31	96	54	115		47	14	45	0	17	54	31	43	28	17
7/27	23	19	38	59	20		35	3	37	0	8	50	5	56	22	45
7/28	23	36	16	59	40		22	17	3	0	8	33	7	256	30	42
7/29	39	16		39	60		26	17	10	0	31	30	23	43	16	17
7/30	18	13		19	57		45	21	4	0	22	48	1	21	21	14
7/31	34	29		8	18				-3	0	15	17	21	21	16	8
8/01	33	17									20	16	5	19	6	6
8/02	46	5									5	10	0	5	31	5
8/03	28	18									14	1	0	23	11	4
8/04	36										17	5	17	13	3	4
8/05	36										5	2	6	3	10	3
8/06	20										14	1	20	3	12	3
8/07	13										1	1	24	4	8	3
8/08	12										1	1	8	12	7	7
8/09	7										0	1	4	5	16	2
8/10											0		2		6	5
8/11											2				6	6
8/12											3				3	4
8/13											0				13	2
8/14											0				5	1
8/15											0				1	3
8/16											0				1	1
8/17											0				4	2
8/18											0				6	1
8/19											0				3	1
8/20											1				0	2
8/21											0				3	3
8/22											2				1	0
8/23											2				2	1
8/24											2				3	
8/25											1				3	
8/26																
Total	3,668	1,395	6,022	3,260	2,831	2,092	2,272	2,712	1,915	3,636	1,952	1,903	2,317	3,856	4,836	2,930

Appendix D.11. Estimated daily escapement of sockeye salmon at the Middle Fork Goodnews River, 1981 - 1996.

Date	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
6/11			3													
6/12			0													
6/13	0		0													
6/14	1		0													
6/15	0		0	92												
6/16	0		3	8		0										
6/17	32		0	11		0										
6/18	107		0	13		0										
6/19	259		0	143		0									0	69
6/20	104		3	100		0				48					75	126
6/21	291		0	452		292				11		123.2			146	387
6/22	571		0	289		276	222			48		6	202	703.2	236	832
6/23	669	1822	0	203		261	193	358		107		108	692	10	353	586
6/24	633	4201	799	379		59	121	269		233		278	1044	276	564	852
6/25	868	6010	527	554		697	427	695		359		5	692	673	509	1368
6/26	690	5019	404	630		431	697	783		158		367	939	513	768	1804
6/27	3108	2559	410	1005	125	1299	818	870	2811	443		799	935	1292	592	1416
6/28	2039	98	262	1461	235	1657	794	703	1107	1227	7230.0	1354	221	767	1033	1676
6/29	1877	268	462	1141	616	1505	771	746	480	1731	75	758.6	700	1906	868	1156
6/30	1511	438	315	1236	825	1353	805	818	605	788	1539	799.6	1072	1922	902	1239
7/01	1798	608	481	1546	1033	2514	840	983	730	1260	2347	1071	780	2203	1251	2585
7/02	1861	675	1053	1855	883	2487	1104	556	524	1731	1754	1071	31	2525	1918	2361
7/03	1438	966	647	1484	565	2442	1333	609	654	1053	2553	999.5	121	876	1583	3174
7/04	1865	2328	1177	1733	1044	2587	1562	635	534	1822	1918	1241	230	934	1515	2963
7/05	2970	3690	1708	1981	1523	2732	1595	661	414	2591	2622	1577	405	4376	1216	3156
7/06	2487	2755	1150	1474	1016	3192	1627	959	722	1348	1797	1328	1273	1323	1256	3978
7/07	1511	1578	1483	1931	1087	3651	1761	609	814	1700	1326	1290	1236	4631	1631	4063
7/08	2176	2912	1131	2419	1158	3158	1436	698	837	1863	2858	1465	1404	3071	1854	2860
7/09	2195	4382	1166	2907	1680	2700	1044	652	968	2026	1910	610	1467	794	1548	2312
7/10	2169	2364	1179	1417	1212	3075	1292	586	1098	1615	2440	952	1239	5029	2339	2635
7/11	2778	2194	1961	1018	1362	1896	873	519	1465	1803	1822	782	1459	1869	2058	1676
7/12	1476	2023	1617	992	777	2098	1012	537	1161	1238	2292	1772	1445	3410	1040	1719
7/13	1889	1319	1091	862	780	1953	1151	365	744	1468	810	753	1080	1862.7	1358	1451
7/14	1223	1567	701	774	774	1809	1125	459	828	1018	1279	1307	1056	1739.7	1562	1429
7/15	1450	1097	992	549	768	1553	1412	246	429	1009	1698	890	736	1655.8	1200	1301
7/16	1439	1513	1002	323	753	1243	762	269	482	1000	1370	582	1124	1487.9	611	1160
7/17	946	785	763	260	963	799	438	210	534	436	1735	640	752	1202.7	1329	979
7/18	476	534	866	121	1077	1104	447	151	621	465	685	661	561	1280	663	803
7/19	758	282	549	117	1038	660	449	157	505	352	784	371	427	1937	749	759

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Date	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
7/20	753	385	439	124	1074	486	450	111	502	245	702	367	208	787	1191	648
7/21	351	238	607	124	771	311	284	101	278	212	818	382	650	438	490	960
7/22	447	202	336	97	468	331	478	137	225	123	447	484	358	836	380	601
7/23	386	187	87	70	121	307	391	123	216	34	535	414	163	257	620	500
7/24	212	172	129	22	221	151	239	80	207	114	411	284	257	295	538	410
7/25	183	157	91	19	102		382	36	198		271	227	84	179	280	468
7/26	144	142	65	37	37		235	31	87		105	182	300	481	403	227
7/27	116	120	91	34	18		87	24	168		158	275	64	363	259	250
7/28	197	90	66	26	11		107	17	82		121	94	105	893	124	200
7/29	228	73		17	4		48	13	55		142	133	191	256	115	106
7/30	127	83		7	0		59	23	59		136	127	135	129	186	88
7/31	44	92		-4	10				62		77	129	65	144	163	66
8/01	57	109									110	49	50	115	92	49
8/02	47	126									69	95	-18	86	140	44
8/03	39	92									48	4	23	33	114	31
8/04	53										59	36	60	33	50	26
8/05	39										36	6	42	22	103	22
8/06	7										34	2.7	17	27	92	13
8/07	1										37	0	62	18	124	22
8/08	7										27	5.5	48	68	42	59
8/09	2										21	0	20	0	198	52
8/10	0										34	2.7	37	5.5	49	35
8/11	11										23	0		0	72	119
8/12	-6										10	0		0	76	65
8/13	0										2	0		0	51	68
8/14	-2										9	0		0	49	43
8/15	0										6	0		5.5	40	88
8/16											12	2.7		11.1	67	55
8/17											13	5.5			20	41
8/18											8				29	37
8/19											8				22	34
8/20											7				22	28
8/21											4				22	12
8/22											12				11	14
8/23											8				7	8
8/24											16				24	
8/25											17				37	
8/26																
Total	49,108	56,255	25,813	32,053	24,131	51,069	28,871	15,799	21,186	31,679	47,397	27,268	26,244	55,751	39,009	58,264

Appendix D.12. Estimated daily escapement of coho salmon at the Middle Fork Goodnews River, 1981 - 1996.

Date [a]	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996 [a]
7/17	0	2	0	0		3	0			0	0	0				
7/18	0	1	0	0		0	0			0	0	0				
7/19	2	1	0	0		0	0			0	0	0				
7/20	4	1	0	0		2	0		108	0	0	0				0
7/21	6	0	0	3		4	0	0	96	0	0	0				0
7/22	3	0	0	4		134	0	0	126	0	0	0				0
7/23	1	0	0	4		17	0	0	153	0	0	0				0
7/24	2	0	0	25	0	3	0	0	180	0	0	0	2			4
7/25	2	1	0	7	7		0	0	99		0	1	0			22
7/26	1	3	0	35	78		0	0	198		0	0	0			30
7/27	1	5	0	21	51		0	3	204		0	0	0	2		25
7/28	1	9	0	39	45		0	0	15		0	25	0	0		43
7/29	9	10	0	30	38		0	3	3		0	20	0	2		
7/30	4	6	0	21	29		62	0	30		0	46	0	0		
7/31	4	4	0	60	34						0	15	0	2		
8/01	24	5	0								0	5	0	19	1	
8/02	14	6	0								0	29	0	29	15	
8/03	22	37	0								0	4	0	24	11	
8/04	15										11	5	10	64	3	
8/05	50										1		6	26	9	
8/06	22										9		9	34	20	
8/07	13										10		12	20	28	
8/08	22										7		2	17	6	191
8/09	33										3		23	70	45	303
8/10	16										10		38	0	30	302
8/11	29										23		30	0	31	455
8/12	25										37		48	0	124	281
8/13	28										3		16	0	164	408
8/14	3										11		84	0	111	333
8/15	0										10		73	0	100	415
8/16											3		11	0	240	464
8/17											28		1010		202	432
8/18											5				376	673
8/19											7				228	1871
8/20											37				219	805
8/21											36				525	769
8/22											91				467	1671
8/23											28				205	202
8/24											812				309	
8/25											796				737	
8/26															344	
8/27															368	
8/28															497	
Total	356	91	0	249	282	163	62	6	1,212	0	1,978	150	1,374	309	5,415	9,699

[a] Coho salmon enumerated is only a partial count as project terminates early in the run.

Appendix D.13. Estimated daily escapement of chum salmon at the Middle Fork Goodnews River, 1981 - 1996.

Date	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
6/11			0													
6/12			0													
6/13	0		0													
6/14	0		0													
6/15	0		0	0												
6/16	1		0	0		0										
6/17	0		0	0		0										
6/18	0		0	0		0										
6/19	0		0	0		0				0					1	2
6/20	4		0	0		0				0					5	7
6/21	5		0	0		0				0		0			16	15
6/22	35		0	0		0	0			0		0	130.2	37.7	34	53
6/23	16	0	0	0		0	0	0		0		0	142	0	56	57
6/24	16	42	3	23		0	0	18		0		2	59	3	50	170
6/25	217	141	0	45		0	0	178		0		0	190	31	77	255
6/26	147	163	30	15		0	7	225		0		28	7	17	159	278
6/27	411	82	17	37	0	0	0	271	322	0		66	290	98	40	172
6/28	372	0	0	107	0	0	9	223	39	0	539	173	24	77	148	181
6/29	293	4	148	55	0	15	17	317	31	57	1	110.4	20	293	110	158
6/30	166	8	82	55	0	30	61	961	71	71	75	178.8	58	326	384	266
7/01	339	12	560	145	0	125	105	1281	111	64	149	329	56	288	1004	529
7/02	556	6	613	234	11	68	58	291	171	57	87	260.5	11	207	1607	384
7/03	189	30	445	491	4	326	89	246	249	171	108	324.5	7	54	845	926
7/04	387	65	545	404	78	404	121	224	154	301	192	410.7	5	80	804	1965
7/05	353	100	646	316	152	482	141	201	58	431	168	468.1	15	369	691	1873
7/06	552	47	409	264	88	447	162	654	270	75	211	397.8	258	323	811	1952
7/07	443	27	682	232	55	411	168	1149	139	88	183	423.9	275.4	1326	333	2874
7/08	653	126	459	433	21	268	91	935	161	111	595	454.8	295.5	1627	950	1507
7/09	659	326	892	633	81	422	183	1785	306	133	938	395	504.9	69	567	1392
7/10	960	224	572	680	228	1478	343	1353	450	184	755	409	1062	1410	2492	1820
7/11	803	308	642	1507	570	699	281	921	435	198	447	677	273	484	2192	1353
7/12	1058	391	1079	906	708	412	330	1536	503	187	751	920	216	3071	1290	494
7/13	658	339	588	1108	288	570	379	634	765	367	257	342	354	1438	715	933
7/14	439	490	157	1295	450	729	408	912	592	289	117	1071	277	1512.5	1214	1055
7/15	643	371	433	1310	612	1457	289	984	388	531	56	1177	429	1716.1	1134	1219
7/16	727	380	407	1325	972	934	1216	805	404	772	368	685	1054	1909.5	1284	1403
7/17	664	212	372	2286	777	709	990	573	420	442	957	1777	887	1768.7	914	1459
7/18	455	167	398	396	690	755	1011	341	435	602	484	672	716	1098	1043	979
7/19	790	122	401	159	873	433	695	384	221	156	749	880	535	1316	1212	947

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Date	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
7/20	1186	193	784	466	630	512	378	282	429	344	1068	356	367	707	1815	1680
7/21	711	175	1034	964	358	592	722	300	224	197	1053	410	175	808	802	2163
7/22	1179	197	671	630	85	1181	1071	834	318	220	1132	974	838	1693	335	1363
7/23	1168	219	215	284	444	981	1479	267	429	242	1496	1019	281	1006	1109	1646
7/24	628	242	447	201	440	324	1130	236	540	120	1774	1114	472	580	985	1449
7/25	605	264	433	256	323		1717	205	361		924	1191	549	860	532	667
7/26	545	286	409	441	404		1069	154	363		890	607	1141	1977	1107	502
7/27	326	204	381	514	261		422	232	378		1411	681	263	539	660	574
7/28	717	116	594	300	230		1552	328	163		586	599	155	1827	162	557
7/29	406	132		211	198		508	343	170		1014	821	328	890	213	555
7/30	270	83		121	113		315	216	160		915	606	641	494	450	465
7/31	177	74		154	223				150		903	161	171	732	516	345
8/01	135	104									1124	230	74	278	313	240
8/02	104	134									754	312	59	219	313	202
8/03	103	161									526	163	16	365	346	175
8/04	107										656	104	164	437	238	181
8/05	119										303	11	77	309	210	111
8/06	75										540	6.9	74	63	235	105
8/07	34										159	4.4	208	84	155	67
8/08	37										172	2.2	98	7	147	63
8/09	43										237	4.4	63	3.5	218	77
8/10	20										293	2.2	107	3.5	118	59
8/11	30										178	2.2		7	72	144
8/12	25										290	2.2		3.5	131	62
8/13	18										113	1.3		0	41	52
8/14	10										42	1.1		7	65	26
8/15	38										97	4.2			33	56
8/16											124	0			32	36
8/17											152				29	43
8/18											62				45	37
8/19											60				15	31
8/20											59				25	18
8/21											30				10	13
8/22											76				13	7
8/23											23				7	1
8/24											48				7	
8/25											54				13	
8/26																
Total	21,827	6,767	15,548	19,003	10,367	14,764	17,517	20,799	10,380	6,410	27,525	22,023	14,472	34,849	33,699	40,450

APPENDIX F

Appendix F.1. Commercial freshwater finfish fishery catch data, Kuskokwim Area, 1977-1996.

Year	Number of Fishermen[b]	Number Caught[a]		Total Weight (lbs)		Total Value ($)		
		Whitefish[c]	Burbot	Whitefish	Burbot	Whitefish	Burbot	Total
1977	3	718	0	d	0	952	0	952
1978	b	1,735	0	6,017	0	d	0	d
1979	b	3,219	0	11,211	0	d	0	d
1980	4	603	0	2,173	0	830	0	830
1981	4	1,197	0	4,620	0	2,310	0	2,310
1982	5	1,512	0	6,219	0	2,856	0	2,856
1983	0	0	0	0	0	0	0	0
1984	2	0	651	0	d	0	d	d
1985	5	555	1,829	2,275	2,016	1,137	455	1,593
1986	3	0	0	0	3,428	0	857	857
1987	4	417	0	1,260	0	1,008	0	1,008
1988	3	d	d	2,588	7	1,991	3	1,994
1989	7	178	282	583	270	501	597	1,098
1990	11	1,664	d	5,502	10	5,166	5	5,171
1991	5	1,413	41	2,442	256	2,412	197	2,609
1992	6	2,124	18	6,309	86	6,285	43	6,328
1993	5	2,509	0	5,208	0	4,898	0	4,898
1994	3	2,393	0	4,905	0	4,345	0	4,345
1995	1	d	0	2,363	0	2,507	0	2,507
1996	2	3,139	0	4,915	0	4,776	0	4,776

a Does not include catches incidental to the commercial salmon fishery.
b Does not include fisherman who delivered catches incidental to the commercial salmon fishery.
c Includes cisco, pike and blackfish (weight only).
d Data not available.

APPENDIX G

Appendix G.1. Commercial miscellaneous saltwater finfish fishery catch data, Kuskokwim Area, 1988-1996.

Year	Number of Fishermen	Species	Number Caught	Total weight (lbs)	Total value ($)
1988	4	Tom Cod[a]	b	439	878
1989	2	Tom Cod	b	591	1,180
1990	1	Tom Cod	300	221	442
1991	2	Tom Cod	b	1,356	2,690
1992	1	Tom Cod	b	303	303
1993	0	-- --	-	--	--
1994	1	Tom Cod	b	100	160
1995	0	-- --	-	--	--
1996	1	Tom Cod	b	713	1,426

a Tom Cod is the local name for Saffron Cod (Eleginus gracilis).
b Data not available

APPENDIX H

Appendix H.1 Estimated biomass and commercial harvest of Pacific herring in Kuskokwim Area fishing districts, Alaska, 1981-1996.

District	Estimated Biomass (st)	Harvest				Roe%	Estimated Value ($ X 1000)	Exploitation Rate (%)
		Sac-roe	Bait	Waste	Total			
1996								
Security Cove	6867	1795	59	5	1859	11.6	1251	27.1
Goodnews Bay	6315	1191	13	0	1204	12.5	895	19.1
Cape Avinof	4500	820	0	0	820	13.4	659	18.2
Nelson Is.	6638	986	44	0	1031	11.4	679	15.5
Nunivak Is.	4197	61	40	0	101	9.9	39	2.4
Total	28517	4854	156	5	5014	12.1	3523	17.6
1995								
Security Cove	6702	1292	0	0	1292	12.3	956	19.3
Goodnews Bay	4224	1051	0	3	1054	13.5	848	25.0
Cape Avinof	3627	485	0	0	485	12.5	363	13.4
Nelson Is.	7754	1113	0	0	1113	10.6	710	14.3
Nunivak Is.	4579	33	7	0	41	11.0	22	0.9
Total	26886	3974	7	3	3985	12.2	2899	14.8
1994								
Security Cove	7638	-	-	-	-	-	-	-
Goodnews Bay	5679	1061	0	1	1062	12.3	391	18.7
Cape Avinof	2827	427	0	0	427	12.2	156	15.1
Nelson Is.	5564	713	4	0	717	11.0	235	12.9
Nunivak Is.	4921	14	0	0	14	8.6	4	0.3
Total	26629	2215	4	1	2220	11.8	787	8.3
1993								
Security Cove	6995	5	0	0	5	12.8	2	0.1
Goodnews Bay	6221	945	9	0	954	10.3	293	15.4
Cape Avinof	2837	206	9	0	215	12.0	75	7.6
Nelson Is.	4944	613	52	74	739	10.6	198	14.9
Nunivak Is.	5176	-	-	-	-	-	-	-
Total	26163	1769	70	74	1913	10.6	568	7.3
1992								
Security Cove	7773	697	127	10	834	9.2	285	10.7
Goodnews Bay	5572	711	29	0	740	9.5	286	13.3
Cape Avinof	3446	443	9	0	452	9.9	178	13.1
Nelson Is.	5275	188	52	6	246	8.3	78	4.7
Nunivak Is.	5703	7	20	0	27	8.5	4	0.5
Total	27769	2046	237	16	2299	9.4	830	8.3
1991								
Security Cove	4434	561	9	0	570	9.3	208	12.9
Goodnews Bay	4387	259	4	0	263	8.9	93	6.0
Cape Avinof	2083	240	27	0	267	9.5	94	12.8
Nelson Is.	2385	-	-	-	-	-	-	-
Nunivak Is.	3903	17	42	0	59	7.5	9	-
Total	17192	1077	82	0	1159	9.2	404	6.7
1990								
Security Cove	2650	174	60	0	234	8.7	94	8.8
Goodnews Bay	2577	427	28	0	455	12.2	314	17.7
Cape Avinof	2020	49	1	0	50	12.0	35	2.5
Nelson Is.	2705	-	-	-	-	-	-	-
Nunivak Is.	422	-	-	-	-	-	-	-
Total	10374	650	89	0	739	11.2	443	7.1

- Continued -

District	Estimated Biomass (st)	Harvest				Roe%	Estimated Value ($ X 1000)	Exploitation Rate (%)
		Sac-roe	Bait	Waste	Total			
1989								
Security Cove	2830	544	10	0	554	9.4	256	19.6
Goodnews Bay	4044	453	162	0	616	8.4	335	15.2
Cape Avinof	2780	90	39	0	129	8.0	54	4.6
Nelson Is.	3316	122	100	11	233	8.5	57	7.0
Nunivak Is.	617	79	37	0	116	9.4	42	18.8
Total	13587	1289	347	11	1647	8.9	744	12.1
1988								
Security Cove	4906	324	0	0	324	9.3	362	6.6
Goodnews Bay	4479	473	10	0	483	8.0	463	10.8
Cape Avinof	4108	348	0	0	348	8.6	264	8.5
Nelson Is.	7152	760	15	0	775	9.2	713	10.8
Nunivak Is.	2800	-	-	-	-	-	-	-
Total	23445	1905	25	0	1930	8.8	1802	8.2
1987								
Security Cove	2300	312	1	0	313	9.7	242	13.6
Goodnews Bay	2000	179	142	0	321	7.3	133	16.1
Nelson Is.	8100	915	8	0	923	9.2	661	11.4
Nunivak Is.	4400	254	160	0	414	7.8	231	9.4
Total	16800	1660	311	0	1971	8.9	1267	11.7
1986								
Security Cove	3700	747	4	0	751	11.2	535	20.3
Goodnews Bay	3000	554	3	0	557	10.4	325	18.6
Nelson Is.	7300	852	34	0	886	10.3	428	12.1
Nunivak Is.	6000	469	42	0	511	10.1	213	8.5
Total	20000	2622	83	0	2705	10.5	1501	13.5
1985								
Security Cove	4900	703	0	30	733	10.1	355	15.0
Goodnews Bay	4300	711	0	13	724	8.7	309	16.8
Nelson Is.	9500	967	10	0	977	10.6	527	10.3
Nunivak Is.	5700	349	9	0	358	8.9	146	6.3
Total	24400	2730	19	43	2792	9.8	1337	11.4
1984								
Security Cove	5100	325	0	10	335	11.8	110	6.6
Goodnews Bay	4100	667	0	50	717	10.1	168	17.5
Total	9200	992	0	60	1052	10.7	278	11.4
1983								
Security Cove	6400	966	107	0	1073	9.4	443	16.8
Goodnews Bay	3200	426	9	0	435	9.4	185	13.6
Total	9600	1392	116	0	1508	9.4	628	15.7
1982								
Security Cove	5100	707	106	0	813	9.3	271	15.9
Goodnews Bay	2600	437	49	0	486	9.5	188	18.7
Total	7700	1144	155	0	1299	9.4	459	16.9
1981								
Security Cove	8300	1150	23	0	1173	8.1	347	14.1
Goodnews Bay	4300	558	99	0	657	7.7	196	15.3
Total	12600	1708	122	0	1830	8.0	543	14.5

Appendix H.2. Number of buyers and fisher participating in Kuskokwim Area Pacific herring fisheries, Alaska, 1981-1996.

Year	District	Number of Buyers	Number of Fishermen	Number of Deliveries
1996	Security Cove	14	326	601
	Goodnews Bay	5	182	1,186
	Cape Avinof	2	161	833
	Nelson Island	3	109	515
	Nunivak Island	2	24	85
1995	Security Cove	12	106	257
	Goodnews Bay	4	127	878
	Cape Avinof	2	93	537
	Nelson Island	4	100	575
	Nunivak Island	2	13	46
1994	Security Cove	No commercial opening		
	Goodnews Bay	2	103	683
	Cape Avinof	1	85	502
	Nelson Island	3	104	409
	Nunivak Island	1	12	14
1993	Security Cove	1	9	9
	Goodnews Bay	3	63	705
	Cape Avinof	1	97	478
	Nelson Island	1	73	487
	Nunivak Island	No commercial opening		
1992	Security Cove	6	58	178
	Goodnews Bay	3	78	375
	Cape Avinof	2	121	335
	Nelson Island	3	85	222
	Nunivak Island	1	14	23
1991	Security Cove	6	52	100
	Goodnews Bay	2	103	137
	Cape Avinof	1	137	463
	Nelson Island	No commercial opening		
	Nunivak Island	2	17	31
1990	Security Cove	9	52	77
	Goodnews Bay	3	126	530
	Cape Avinof	1	101	109
	Nelson Island	No commercial opening		
	Nunivak Island	No commercial opening		

-continued-

Appendix H.2 (page 2 of 2)

Year	District	Number of Buyers	Number of Fishermen	Number of Deliveries
1989	Security Cove	8	104	108
	Goodnews Bay	6	138	533
	Cape Avinof	3	147	335
	Nelson Island	4	162	438
	Nunivak Island	3	45	210
1988	Security Cove	4	31	51
	Goodnews Bay	6	60	309
	Cape Avinof	1	98	485
	Nelson Island	7	174	547
	Nunivak Island	No commercial opening		
1987	Security Cove	8	65	67
	Goodnews Bay	4	117	191
	Nelson Island	9	235	633
	Nunivak Island	4	61	341
1986	Security Cove	11	88	199
	Goodnews Bay	5	104	319
	Nelson Island	4	163	1,099
	Nunivak Island	5	36	284
1985	Security Cove	6	107	268
	Goodnews Bay	5	83	420
	Nelson Island	6	143	776
	Nunivak Island	5	37	273
1984	Security Cove	4	38	86
	Goodnews Bay	4	130	390
1983	Security Cove	6	94	312
	Goodnews Bay	4	84	225
1982	Security Cove	3	107	250
	Goodnews Bay	3	84	297
1981	Security Cove	7	113	311
	Goodnews Bay	5	175	479

Appendix H.3. Commercial harvest, effort and value of Pacific herring in Kuskokwim Area fishing districts, Alaska, 1981-1996

Year	District	Estimated Harvest (st)	Number of permits	Hours fished	CPUE (st)	Estimated Value	Income per permit
1996	Security Cove	1859	326	5.5	1.04	$1,252,270	$3,841
	Goodnews Bay	1204	182	45.0	0.15	$893,900	$4,912
	Cape Avinof	820	161	57.0	0.09	$659,280	$4,095
	Nelson Is.	1031	109	25.0	0.38	$676,624	$6,208
	Nunivak Is.	101	24	256.0	0.02	$38,234	$1,593
1995	Security Cove	1292	106	12.0	1.02	$956,000	$9,019
	Goodnews Bay	1054	127	56.0	0.15	$848,000	$6,677
	Cape Avinof	485	93	48.0	0.11	$363,000	$3,903
	Nelson Is.	1113	100	28.0	0.40	$710,000	$7,100
	Nunivak Is.	41	13	387.0	0.01	$22,000	$1,692
1994	Security Cove	--	--	--	--	--	--
	Goodnews Bay	1062	103	38.0	0.27	$391,000	$3,796
	Cape Avinof	427	85	62.0	0.08	$156,000	$1,835
	Nelson Is.	717	104	26.0	0.27	$235,000	$2,260
	Nunivak Is.	14	12	6.0	0.19	$4,000	$333
1993	Security Cove	5	9	24.5	0.02	$2,000	$222
	Goodnews Bay	954	63	123.0	0.12	$293,000	$4,651
	Cape Avinof	215	97	106.0	0.02	$75,000	$773
	Nelson Is.	739	73	63.5	0.16	$198,000	$2,712
	Nunivak Is.	--	--	--	--	--	--
1992	Security Cove	834	58	34.0	0.42	$285,000	$4,914
	Goodnews Bay	740	78	29.0	0.33	$286,000	$3,667
	Cape Avinof	452	121	12.0	0.31	$178,000	$1,471
	Nelson Is.	246	85	10.0	0.29	$78,000	$918
	Nunivak Is.	27	14	6.0	0.32	$4,000	$286
1991	Security Cove	570	52	12.0	0.91	$208,000	$4,000
	Goodnews Bay	263	103	4.0	0.64	$93,000	$903
	Cape Avinof	267	137	28.0	0.07	$94,000	$686
	Nelson Is.	--	--	--	--	--	--
	Nunivak Is.	59	17	12.0	0.29	$9,000	$529
1990	Security Cove	234	52	7.0	0.64	$94,000	$1,808
	Goodnews Bay	455	126	32.0	0.11	$314,000	$2,492
	Cape Avinof	50	101	3.0	0.17	$35,000	$347
	Nelson Is.	--	--	--	--	--	--
	Nunivak Is.	--	--	--	--	--	--
1989	Security Cove	554	104	4.0	1.33	$256,000	$2,462
	Goodnews Bay	616	138	50.0	0.09	$335,000	$2,428
	Cape Avinof	129	147	194.0	0.00	$54,000	$367
	Nelson Is.	233	162	15.0	0.10	$57,000	$352
	Nunivak Is.	116	45	186.0	0.01	$42,000	$933

- continued -

.ppendix H.3. (page 2 of 2.

Year	District	Estimated Harvest (st)	Number of permits	Hours fished	CPUE[a] (st)	Estimated Value	Income per permit
1988	Security Cove	324	31	23.5	0.44	$362,000	$11,677
	Goodnews Bay	483	60	40.0	0.20	$463,000	$7,717
	Cape Avinof	348	98	88.5	0.04	$264,000	$2,694
	Nelson Is.	775	174	7.5	0.59	$713,000	$4,098
	Nunivak Is.	--	--	--	--	--	--
1987	Security Cove	313	65	13.0	0.37	$242,000	$3,723
	Goodnews Bay	321	117	11.0	0.25	$133,000	$1,137
	Nelson Is.	923	235	6.0	0.65	$661,000	$2,813
	Nunivak Is.	414	61	39.0	0.17	$231,000	$3,787
1986	Security Cove	751	88	73.0	0.12	$535,000	$6,080
	Goodnews Bay	557	104	53.0	0.10	$325,000	$3,125
	Nelson Is.	886	163	40.0	0.14	$428,000	$2,626
	Nunivak Is.	511	36	156.0	0.09	$213,000	$5,917
1985	Security Cove	733	107	125.0	0.05	$335,000	$3,131
	Goodnews Bay	724	83	130.0	0.07	$309,000	$3,723
	Nelson Is.	977	143	44.0	0.16	$527,000	$3,685
	Nunivak Is.	358	37	228.0	0.04	$146,000	$3,946
1984	Security Cove	335	38	345.0	0.03	$110,000	$2,895
	Goodnews Bay	717	130	139.0	0.04	$168,000	$1,292
1983	Security Cove	1073	94	87.0	0.13	$443,000	$4,713
	Goodnews Bay	435	84	278.0	0.02	$185,000	$2,202
1982	Security Cove	813	107	302.0	0.03	$271,000	$2,533
	Goodnews Bay	486	84	314.0	0.02	$188,000	$2,238
1981	Security Cove	1173	113	90.0	0.12	$347,000	$3,071
	Goodnews Bay	657	175	133.0	0.03	$196,000	$1,120

a CPUE = catch per permit per hour fished

Appendix H.4. Pacific herring subsistence harvest (st) and effort data from selected Kuskokwim Area villages, Alaska, 1975-1996[a].

Village	Year																					
	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Nelson Island																						
Tununak	22	15	57	38	34	65	40	48	94	e	43	63	48	49	47	54	21	32	45	42	30	26
Umkumiut	33	9	3	11	8	3	10	0	e	e	e	e	d	d	d	d	d	d	d	d	d	d
Toksook Bay	34	35	21	37	51	29	14	35	-	-	46	70	51	59	52	46	40	43	23	53	46	42
Nightmute	-	-	-	-	-	-	-	-	-	-	3[b]	21	15	16	15	18	8	10	9	13	13	16
Newtok	:	:	:	:	:	:	:	:	:	:	7[b]	13	10	12	10	8	1	7	6	9	9	12
Total	89	59	81	86	93	97	64	83	94	-	99	167	124	136	124	126	70	92	82	117	98	96
No. of Fishing Families	109	42	90	83	54	70	93	65	43	-	65[b]	72[b]	96	104	.[b]	100	85	97	89	-	91	96
Nunivak Island																						
Mekoryuk	-	-	-	-	-	-	-	-	-	-	<1	<1	-	e	e	5	4	4	3	e	e	e
No. of Fishing Families	-	-	-	-	-	-	-	-	-	-	11	6[b]	-	e	e	19	20	17	16	e	e	e
Other Kuskokwim Delta																						
Chefornak	-	-	-	-	-	-	-	-	-	-	13[b]	e	14	e	e	e	e	e	e	e	e	e
Kipnuk	-	-	-	-	-	-	-	-	-	-	9	e	14	e	e	e	e	e	e	e	e	e
Kongiganak	-	-	-	-	-	-	-	-	-	-	3	2	e	e	e	e	e	e	e	e	e	e
Kwigillingok	:	11	1	:	8	13	13	:	:	5	e	e	e	e	e	e	e	e	e	e	e	
Total	-	11	1	-	8	13	-	13	-	-	30	2	28	e	e	e	e	e	e	e	e	e
No. of Fishing Families	-	8	9	-	22	19	-	21	-	-	55[b]	12[b]	49	e	e	e	e	e	e	e	e	e
All Areas Combined																						
Total Catch	92	75	85	91	112	121	78	107	103	11	138	177	155	136	124	145	74	95	84	117	98	96
No. of Fishing Families	143	91	129	112	160	150	139	89	80	47	175[b]	131	184	104	.[b]	119	95	114	105	-	91	96

a Subsistence survey results are believed to accurately reflect harvest trends, however, reported catches reflect minimum figures since all fishermen cannot be contacted.
b Fishing families were not interviewed or only a portion of fishing families were interviewed as catch was enumerated while on drying racks.
c Survey not allowed by village council.
d Umkumiut effort included with Toksook Bay and Nightmute.
e Not surveyed.

APPENDIX S

Appendix S. 1. 1996 Kuskokwim Area subsistence salmon harvest calendar.

PLEASE WRITE THE NUMBER OF ALL SALMON CAUGHT EACH DAY BY PEOPLE LIVING IN YOUR HOUSE. PLEASE INCLUDE SALMON THAT WERE GIVEN TO PEOPLE WHO LIVE IN OTHER HOUSES AND SALMON THAT WERE CAUGHT FOR DOGFOOD. DO NOT INCLUDE SALMON THAT WERE SOLD WHEN COMMERCIAL FISHING.

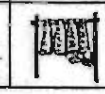
WHEN DONE SALMON FISHING FOR THE YEAR, FOLD THIS CALENDAR SO THAT THE ADDRESS ON THE BACK IS VISIBLE AND DROP IN THE MAIL. WE HAVE PAID THE POSTAGE.

This calendar is sent to you by the Subsistence Division of the Alaska Department of Fish and Game in Bethel.

NAME

Bulk Rate
U. S. Postage
Paid
Fairbanks, AK
Permit No. 99

MAY 1996 SUBSISTENCE SALMON CALENDAR

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
12 King ___ Chum ___ Red ___	13 King ___ Chum ___ Red ___	14 King ___ Chum ___ Red ___	15 King ___ Chum ___ Red ___	16 King ___ Chum ___ Red ___	17 King ___ Chum ___ Red ___	18 King ___ Chum ___ Red ___
19 King ___ Chum ___ Red ___	20 King ___ Chum ___ Red ___	21 King ___ Chum ___ Red ___	22 King ___ Chum ___ Red ___	23 King ___ Chum ___ Red ___	24 King ___ Chum ___ Red ___	25 King ___ Chum ___ Red ___
26 King ___ Chum ___ Red ___	27 King ___ Chum ___ Red ___	28 King ___ Chum ___ Red ___	29 King ___ Chum ___ Red ___	30 King ___ Chum ___ Red ___	31 King ___ Chum ___ Red ___	

Tanyaqvak = Ikalluk = Sayak = Chinook = Sockeye =

JUNE 1996 SUBSISTENCE SALMON CALENDAR

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
						1 King ___ Chum ___ Red ___
2 King ___ Chum ___ Red ___	3 King ___ Chum ___ Red ___	4 Kin ___ Chum ___ Red ___	5 King ___ Chum ___ Red ___	6 King ___ Chum ___ Red ___	7 King ___ Chum ___ Red ___	8 King ___ Chum ___ Red ___
9 King ___ Chum ___ Red ___	10 King ___ Chum ___ Red ___	11 King ___ Chum ___ Red ___	12 King ___ Chum ___ Red ___	13 King ___ Chum ___ Red ___	14 King ___ Chum ___ Red ___	15 King ___ Chum ___ Red ___
16 King ___ Chum ___ Red ___	17 King ___ Chum ___ Red ___	18 King ___ Chum ___ Red ___	19 King ___ Chum ___ Red ___	20 King ___ Chum ___ Red ___	21 King ___ Chum ___ Red ___	22 King ___ Chum ___ Red ___
23 Kin ___ Chum ___ Red ___	24 King ___ Chum ___ Red ___	25 King ___ Chum ___ Red ___	26 King ___ Chum ___ Red ___	27 King ___ Chum ___ Red ___	28 King ___ Chum ___ Red ___	29 King ___ Chum ___ Red ___
30 King ___ Chum ___ Red ___						

Tanyaqvak = Ikalluk = Sayak = Chinook = Sockeye =

JULY 1996 SUBSISTENCE SALMON CALENDAR

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	1 King ___ Chum ___ Red ___	2 King ___ Chum ___ Red ___	3 King ___ Chum ___ Red ___	4 King ___ Chum ___ Red ___	5 King ___ Chum ___ Red ___	6 King ___ Chum ___ Red ___
7 King ___ Chum ___ Red ___	8 King ___ Chum ___ Red ___	9 King ___ Chum ___ Red ___	10 King ___ Chum ___ Red ___	11 King ___ Chum ___ Red ___	12 King ___ Chum ___ Red ___	13 King ___ Chum ___ Red ___
14 King ___ Chum ___ Red ___	15 King ___ Chum ___ Red ___	16 King ___ Chum ___ Red ___	17 King ___ Chum ___ Red ___	18 King ___ Chum ___ Red ___	19 King ___ Chum ___ Red ___	20 King ___ Chum ___ Red ___
21 King ___ Chum ___ Red ___ Coho ___	22 King ___ Chum ___ Red ___ Coho ___	23 King ___ Chum ___ Red ___ Coho ___	24 King ___ Chum ___ Red ___ Coho ___	25 King ___ Chum ___ Red ___ Coho ___	26 King ___ Chum ___ Red ___ Coho ___	27 King ___ Chum ___ Red ___ Coho ___
28 King ___ Chum ___ Red ___ Coho ___	29 King ___ Chum ___ Red ___ Coho ___	30 King ___ Chum ___ Red ___ Coho ___	31 King ___ Chum ___ Red ___ Coho ___			

Qaigtak = Salyer =

Appendix S. 1. continued.

PLEASE WRITE THE NUMBER OF ALL SALMON CAUGHT EACH DAY BY PEOPLE LIVING IN YOUR HOUSE. PLEASE INCLUDE SALMON THAT WERE GIVEN TO PEOPLE WHO LIVE IN OTHER HOUSES AND SALMON THAT WERE CAUGHT FOR DOGFOOD. DO NOT INCLUDE SALMON THAT WERE SOLD WHEN COMMERCIAL FISHING.

WHEN DONE SALMON FISHING FOR THE YEAR, FOLD THIS CALENDAR SO THAT THE ADDRESS ON THE BACK IS VISIBLE AND DROP IN THE MAIL. WE HAVE PAID THE POSTAGE.

This calendar is sent to you by the Subsistence Division of the Alaska Department of Fish and Game in Bethel.

NAME

AUGUST 1996 SUBSISTENCE SALMON CALENDAR

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
				1 King _____ Chum _____ Red _____ Coho _____	2 King _____ Chum _____ Red _____ Coho _____	3 King _____ Chum _____ Red _____ Coho _____
4 TAYYAQVAK = King _____ IQALLUK = Chum _____ SAYAK = Red _____ QAKIYAK = Coho _____	5 King _____ Chum _____ Red _____ Coho _____	6 King _____ Chum _____ Red _____ Coho _____	7 King _____ Chum _____ Red _____ Coho _____	8 King _____ Chum _____ Red _____ Coho _____	9 King _____ Chum _____ Red _____ Coho _____	10 King _____ Chum _____ Red _____ Coho _____
11 CHINOOK = King _____ Chum _____ SOCKEYE = Red _____ SILVER = Coho _____	12 King _____ Chum _____ Red _____ Coho _____	13 King _____ Chum _____ Red _____ Coho _____	14 King _____ Chum _____ Red _____ Coho _____	15 King _____ Chum _____ Red _____ Coho _____	16 King _____ Chum _____ Red _____ Coho _____	17 King _____ Chum _____ Red _____ Coho _____
18 Chum _____ Red _____ Coho _____	19 Chum _____ Red _____ Coho _____	20 Chum _____ Red _____ Coho _____	21 Chum _____ Red _____ Coho _____	22 Chum _____ Red _____ Coho _____	23 Chum _____ Red _____ Coho _____	24 Chum _____ Red _____ Coho _____
25 Chum _____ Red _____ Coho _____	26 Chum _____ Red _____ Coho _____	27 Chum _____ Red _____ Coho _____	28 Chum _____ Red _____ Coho _____	29 Chum _____ Red _____ Coho _____	30 Chum _____ Red _____ Coho _____	31 Chum _____ Red _____ Coho _____

SEPTEMBER 1996 SUBSISTENCE SALMON CALENDAR

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1 IQALLUK = Chum _____ SAYAK = Red _____ QAKIYAK = Coho _____	2 Chum _____ Red _____ Coho _____	3 Chum _____ Red _____ Coho _____	4 Chum _____ Red _____ Coho _____	5 Chum _____ Red _____ Coho _____	6 Chum _____ Red _____ Coho _____	7 Chum _____ Red _____ Coho _____
8 Chum _____ Red _____ Coho _____	9 Chum _____ Red _____ Coho _____	10 Chum _____ Red _____ Coho _____	11 Chum _____ Red _____ Coho _____	12 Chum _____ Red _____ Coho _____	13 Chum _____ Red _____ Coho _____	14 Chum _____ Red _____ Coho _____
15 Chum _____ SOCKEYE = Red _____ SILVER = Coho _____	16 Chum _____ Red _____ Coho _____	17 Chum _____ Red _____ Coho _____	18 Chum _____ Red _____ Coho _____	19 Chum _____ Red _____ Coho _____	20 Chum _____ Red _____ Coho _____	21 Chum _____ Red _____ Coho _____
22 Chum _____ Red _____ Coho _____	23 Chum _____ Red _____ Coho _____	24 Chum _____ Red _____ Coho _____	25 Chum _____ Red _____ Coho _____	26 Chum _____ Red _____ Coho _____	27 Chum _____ Red _____ Coho _____	28 Chum _____ Red _____ Coho _____
29 Chum _____ Red _____ Coho _____	30 Chum _____ Red _____ Coho _____					

Were your household's subsistence salmon needs met this year? ____Yes ____No

If not, why? _____

Appendix S. 2. 1996 Household survey form.

Division of Subsistence, Bethel COMM. ID# _____

Chinook= *"taryaqvak,"* Chum= *"Iqalluk,"* Sockeye= *"sayak,"* Coho= *"qakiiyaq"* HHID# _____

KUSKOKWIM AREA 1996

POST-SEASON SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY

* (Questions marked with an asterisk are asked of all households interviewed) kb

Community: _____ Household Head Name: _____

Survey Date: 10 11 _____, 1996 Name of Person Interviewed: HH, _____

Interviewer: LO SM _____ Household P.O. Box: _____

Was this household in community last year?: No ___ Yes ___

*1. Did this household catch salmon for subsistence use this year? No___ (go to # 3) Yes___

2. May I have your salmon calendar? (If household fished and we don't already have or don't collect the calendar, go to # 7)
Picked up by interviewer ___ (go to # 10) Mailed it to ADFG___ Didn't get one___
Didn't use___ Lost or unavailable___

*3. Does this household usually subsistence fish for salmon? No___ Yes___

HOUSEHOLD DIDN'T FISH (Household did not help harvest/catch salmon)

4. Did this household help another household process ("put up") salmon?
No ___ (go to # 17) Yes ___: (Names, HHIDs) _____

5. Please estimate how many salmon all of you processed ("put up").
CHINOOK___ ("kings") CHUM___ ("dogs") SOCKEYE___ ("reds") COHO___ ("silvers") Could not estimate___

6. Please estimate how many salmon were for your household only.
CHINOOK___ ("kings") CHUM___ ("dogs") SOCKEYE___ ("reds") COHO___ ("silvers") Could not estimate___

(Go to Question 17)

HOUSEHOLD FISHED, ADF&G *DOES NOT HAVE* CALENDAR

7. Did other households fish with you? No ___ Yes ___: (Names, HHIDs) _____

8. Please estimate how many salmon your household (or all households together) caught. (Ask about salmon already eaten, frozen, given to other households, and dog food)
CHINOOK___ ("kings") CHUM___ ("dogs") SOCKEYE___ ("reds") COHO___ ("silvers") Could not estimate___
Salmon are included with Household _____ (HHID)

9. Please estimate how many salmon were for your household only.
CHINOOK___ ("kings") CHUM___ ("dogs") SOCKEYE___ ("reds") COHO___ ("silvers") All___ Could not estimate___

(Go to Question 15)

HOUSEHOLD FISHED, ADF&G *DOES HAVE* CALENDAR

10. Are all of the salmon this household caught written on the calendar? (Ask about and include salmon already eaten, frozen, given to other households, and dog food)
No ___ Yes ___ (go to # 12)

11. How many additional salmon, not written on the calendar, were caught?
CHINOOK___ ("kings") CHUM___ ("dogs") SOCKEYE___ ("reds") COHO___ ("silvers") Could not estimate___

12. Did other households fish with you? No ___ (go to # 15) Yes ___: (Names, HHIDs)

LK

13. Are the salmon they caught written on your calendar? No ___ Yes ___

14. Please estimate how many salmon were for your household only. All_____
CHINOOK_____ CHUM_____ SOCKEYE_____ COHO_____ Could not estimate_____
(Go to Question 15) .....

FISHING GEAR (For subsistence fishing households only)

15. What type(s) of fishing gear was used for catching subsistence salmon this year?

Drift net ___, Set Net ___, Rod and Reel ___, Fishwheel ___, Spear ___, Sein ___,

16. How many salmon did your household catch and keep with Rod and Reel this year?

CHINOOK_____ CHUM_____ SOCKEYE_____ COHO_____

COMMERCIAL FISHING

*17. Does this household commercial fish? No ___ (go to # 21), Yes ___
If yes, where ? ___Kuskokwim River or Bay ___Yukon Area ___Bristol Bay

18. Were all of the salmon caught when commercial fishing sold or were some brought home to eat or processed for subsistence? All were sold _____ Some were used for subsistence _____

19. How many commercially caught salmon were used for subsistence?
CHINOOK_____ CHUM_____ SOCKEYE_____ COHO_____

20. Are those salmon listed on the calendar or included in the catch numbers you gave me?
Yes___, No ___

HOUSEHOLD SIZE

*21. How many people live in this household? _____

DOG FOOD (For subsistence fishing households only)

22. Did this household catch salmon for dog food?
No ___ (go to # 26) Only backbones/heads/guts/scraps _____ (go to # 26)
Yes ___

23. How many salmon? CHUM_____ ("dogs") SOCKEYE_____ ("reds") COHO_____ ("silvers")

24. Are the salmon caught for the dogs included on your calendar or in the estimates you gave me ?
Yes___, No ___

25. How many dogs does this household have? _____

26. (For subsistence fishing households only)
How was subsistence salmon fishing for your household this year?
Kings: __ Very Good __ Average __ Poor If Poor, why?_____
Chums: __ Very Good __ Average __ Poor If Poor, why?_____
Sockeye: __ Very Good __ Average __ Poor If Poor, why?_____
Coho: __ Very Good __ Average __ Poor If Poor, why?_____

*27. What could Fish and Game do to make subsistence fishing better for you? (regulations, etc)
_____

Appendix S. 3. 1996 Postcard survey form.

Dear Kuskokwim Area Resident,

Please take a moment to answer the questions on the back side of this card and drop it in the mail to us. No stamp is necessary, postage is already paid. We will mail you a subsistence salmon harvest summary in Spring after the survey data is compiled.

We appreciate your help to document subsistence salmon harvests. We use this information to help the Board of Fisheries and the Department of Fish and Game make informed management decisions affecting the Kuskokwim Area. Your household harvest information remains confidential. Please call if you have any questions.

Thank you,

Subsistence Division
Room 214, BNC Complex
Bethel (543-3100)

Division of Subsistence
Alaska Dept. of Fish and Game
P.O. Box 1788
Bethel, AK 99559

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL
First Class Mail Permit No. 50 Fairbanks, AK.

Postage Will Be Paid By Addressee

State of Alaska
Department of Fish and Game
Subsistence Division
P.O. Box 1788
Bethel, AK 99559-1788

(correct your address if necessary)
NAME:_____
P.O. BOX:_____
CITY, STATE:_____
ZIPCODE:_____

Did your household harvest salmon for subsistence use this year?
(include any salmon kept for subsistence when commercial fishing) Yes___ No___

How many subsistence salmon did your household harvest?
(include salmon eaten, given away, frozen, dried, smoked, canned, or for dogfood)

Chinook_____ (King salmon) Chum_____ (Dog salmon) Sockeye_____ (Red salmon) Coho_____ (Silver salmon)

What type(s) of gear did your household use to catch subsistence salmon ?
Set net_____ Drift net_____ Fishwheel_____ Rod and reel_____

How was subsistence salmon fishing for your household this year?
King: Very good Average Poor, If Poor, why_____
Sockeye: Very good Average Poor, If Poor, why_____
Chum: Very good Average Poor, If Poor, why_____
Coho: Very good Average Poor, If Poor, why_____