ANNUAL MANAGEMENT REPORT
2002
NORTON SOUND - PORT CLARENCE - KOTZEBUE

By
Allegra Banducci
Elisabeth L. Brennan
Wes Jones
Jim Menard

Regional Information Report[1] No. 3A03-30

Alaska Department of Fish and Game
Division of Commercial Fisheries
333 Raspberry Road
Anchorage, Alaska 99518-1599

December 2003

[1] The Regional Information Report Series was established in 1987 to provide an information access system for all unpublished divisional reports. These reports frequently serve diverse ad hoc informational purposes or archive basic uninterpreted data. To accommodate timely reporting of recently collected information, reports in this series undergo only limited internal review and may contain preliminary data: this information may be subsequently finalized and published in the formal literature. Consequently, these reports should not be cited without prior approval of the author of the Commercial Fisheries Management and Development Division.

AUTHORS

Allegra Banducci is a Norton Sound Fish and Game Program Technician for the Alaska Department of Fish and Game, Division of Commercial Fisheries, Pouch 1148, Nome AK 99762.

Elisabeth L. Brennan was a Norton Sound Assistant Area Management Biologist for the Alaska Department of Fish and Game, Division of Commercial Fisheries, Pouch 1148, Nome AK 99762.

Wes Jones is a Norton Sound and Kotzebue Assistant Area Management Biologist for the Alaska Department of Fish and Game, Division of Commercial Fisheries, Pouch 1148, Nome AK 99762.

Jim Menard is the AYK Region Norton Sound and Kotzebue Area Management Biologist for the Alaska Department of Fish and Game, Division of Commercial Fisheries, Pouch 1148, Nome AK 99762.

ACKNOWLEDGEMENTS

Many people contributed toward the collection and processing of the data contained in this report. Alaska Department of Fish and Game seasonal employees work long and hard hours to provide the management staff with timely and useful fishery, abundance, and escapement information. We would like to thank the various project crew leaders, catch monitors, and the Admin Clerk III, who, over the past year, acted as liaisons for the management staff in communicating with the public and on whose shoulders the burden of gathering the baseline data displayed in this report has rested most directly. We thank the Norton Sound Economic Development Corporation for providing funding for interns, and Kawerak Inc., and Unalakleet IRA for their assistance in cooperative projects. We also thank the regional biologist and biometrician staff for technical assistance and acknowledge the data collection of many technicians and volunteers this past season.

OFFICE OF EQUAL OPPORTUNITY (OEO) STATEMENT

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Continued)

Page

LIST OF TABLES

Table. Page

LIST OF TABLES (Continued)

Table. Page

LIST OF FIGURES

Figure Page

LIST OF FIGURES (Continued)

Figure Page

LIST OF APPENDICES

LIST OF APPENDICES (Continued)

LIST OF APPENDICES (Continued)

LIST OF APPENDICES (Continued)

PRESENTATION

This report summarizes the 2002 season and historical information concerning management of the commercial and subsistence fisheries of the Norton Sound, Port Clarence and Kotzebue Sound Districts. Data from special management and research projects are included in this report. A more complete documentation of project results is presented in separate reports.

Data presented in this report supersedes information found in previous management reports. An attempt was made to correct errors presented in earlier reports. Previously unreported data was included and is indicated by appropriate footnotes. Current year catch data presented has been derived from seasonal field data.

This report is organized into the following major sections:

(1) Salmon
(2) Herring
(3) King Crab
(4) Miscellaneous species

Tabular data has been separated into two categories to facilitate use of this report: 1) tables presenting annual data, and 2) appendix tables which present historical comparisons.

SECTION 1: SALMON
(Includes Norton Sound, Port Clarence
and Kotzebue Districts)

INTRODUCTION

Boundaries

The Norton Sound, Port Clarence and Kotzebue Sound salmon management districts include all waters from Point Romanof in southern Norton Sound to Point Hope and includes St. Lawrence Island. These management districts are over 65,000 square miles, and have coastline exceeding that of California, Oregon, and Washington combined.

Salmon Resources

Five species of Pacific salmon are indigenous to the area with chum *(Oncorhynchus keta)* and pink salmon *(O. gorbuscha)* historically are the most abundant (Tables 1-11). Chum, pink, and chinook (king) salmon *(O. tschawytscha)* are found as far north as Barrow; however, these species are uncommon north of the Kotzebue Sound drainages. The northernmost large concentrations of chum salmon are found within the Kotzebue Sound drainages, but large numbers of pink, chinook and coho *(O. kisutch)* salmon are not found north of Norton Sound. Small sockeye (red) salmon *(O. nerka)* populations exist within a few southern Seward Peninsula drainages.

Commercial Fishery

In 1959 and 1960, Department biologists conducted resource inventories indicated harvestable surpluses of salmon available in several river systems of the Norton Sound-Kotzebue area. The Department liberalized various regulations and encouraged processors to explore and develop new fishing grounds since statehood. As a result, commercial salmon fishing activity grew significantly, enabling some local residents to obtain cash income.

Most of commercial fishers and many buying station workers are resident Native Alaskans (Yupik, Inupiat, and Siberian Yupik). Commercial fishers operate set gillnets from outboard powered skiffs to capture salmon. All commercially caught salmon are fished in coastal marine waters.

Salmon effort and catch per unit of effort data (CPUE) presented throughout this section were derived in this stepwise approach:

- Boat (or fisher) hours have been computed after assuming that if a fishing boat delivers during a fishing period, it fished the entire period.
- The total number of individual boats delivering in any period is multiplied by the number of hours open to commercial fishing.
- Catch per fisher (or boat) hour is obtained by dividing the total fisher hours into the catch for the corresponding period of time. Total fishers (or boats) is the total number of fishers making deliveries, regardless of how many deliveries were made

or days fished during a particular period or season. There are a number of fishers who deliver only once or twice during the entire season. Total days fished is the total number of hours open to commercial fishing during the season divided by 24 hours.

Subsistence Fishery

There are approximately 16,000 people in the area, the majority of whom are Native Alaskans, residing in more than 26 small villages scattered along the coast and the major river systems. Nearly all of the local residents are dependent to varying degrees on the fish and game resources for their livelihood (Tables 1-18 and Appendicies A1-G1).

Subsistence fishers operate gillnets or seines in the main rivers and, to a lesser extent, in the coastal marine waters capturing primarily salmon, whitefish, arctic char and inconnu (sheefish). Beach seines are used near the spawning grounds to catch schooling or spawning salmon and other species of fish. The major portion of fish taken during the summer months is air dried or smoked for later consumption by villagers or occasionally their dogs.

Prior to 1960, subsistence harvest information is incomplete or entirely lacking. From the early 1960s until 1982, the Department conducted annual household surveys in communities with major salmon fisheries. Beginning in 1983, budgetary restrictions made it impossible to conduct surveys in each village. For the last 5 years that these surveys were conducted for Norton Sound (1998-2002) the average subsistence catch was 78,352 salmon including all species (Appendix A8). The majority of salmon taken are pinks and chums.

Subsistence surveys for the Kotzebue area were less complete. An expansion of documented surveys from several years for different villages estimates total subsistence salmon harvest for the Kotzebue Sound area to be approximately 75,000 annually (Appendix C5).

Since 1974, subsistence salmon catches in the Nome Subdistrict (Subdistrict 1) have been determined from the return of catch calendars as required under a permit system. Not all fishers obtained or returned permits, and the data were not expanded, therefore these harvests should be considered minimum figures.

In 1994, the Department initiated a new annual subsistence salmon harvest assessment effort in northwest Alaska that provided more extensive, complete, and reliable salmon harvest estimates than existed previously. In 2002, the department continued its subsistence salmon harvest assessment program. Household surveys were conducted in eight communities in the Norton Sound District, both communities in the Port Clarence District, and two of the fifteen Kotzebue District communities. In Kotzebue, subsistence salmon harvests were determined in conjunction with a big game harvest survey. And in the Nome area, harvests were determined through fishing permits with catch calendars. In the twelve surveyed communities, surveyors attempted to contact 100 percent of the households, with an actual contact rate of 93 percent in 2002. The harvest data were not expanded in 2002 to account

for those households not contacted. Department staff believed that expansion of permit data led to an overestimation of the salmon harvest because unreturned permits were most likely from households that did not fish.

The goals of the postseason household survey:

1) collect harvest data to estimate subsistence salmon by species and community,
2) compile information on gear types, participation rates, sharing, use of salmon for dog food, and household size.

Management

The Division of Commercial Fisheries of the Alaska Department of Fish and Game is responsible for the management of commercial and subsistence fisheries in this vast area. The permanent full-time staff assigned to this area during 2002 consisted of an Area Management Biologist, and Area Research Biologist, two Assistant Area Management Biologists, an Assistant Research Biologist and the Admin Clerk III stationed in the Nome office. In addition, seasonal assistance in conducting various management and research activities was provided by approximately 20 seasonal biologists and technicians in Norton Sound and Kotzebue Sound. Biologists from the regional staff provided additional assistance. In 2002, interns funded by Norton Sound Economic Development Corporation (NSEDC) were utilized as fisheries technicians in some projects. Three cooperative projects staffed by Kawerak Inc. and one project operated by U.S. Bureau of Land Management (BLM) in Norton Sound supplemented the salmon escapement monitoring activities of the area staff.

The main objective of the Department's program is to manage the commercial and subsistence salmon fisheries on a sustained yield basis. Various field projects are conducted to provide information on salmon abundance, migration and stock composition. Summaries of ADF&G, Kawerak Inc., and BLM projects are presented in Appendix G2.

Management of the salmon fishery is complicated by the difficulty obtaining accurate escapement data and by insufficient comparative catch and return information. Management problems are compounded by the need to provide not only for adequate escapements, but also for the needs of several different user groups. Alaska State law requires that subsistence uses receive priority over other uses of fish and wildlife resources. If subsistence harvest or demands increase, commercial fishing and sport fishing may be restricted.

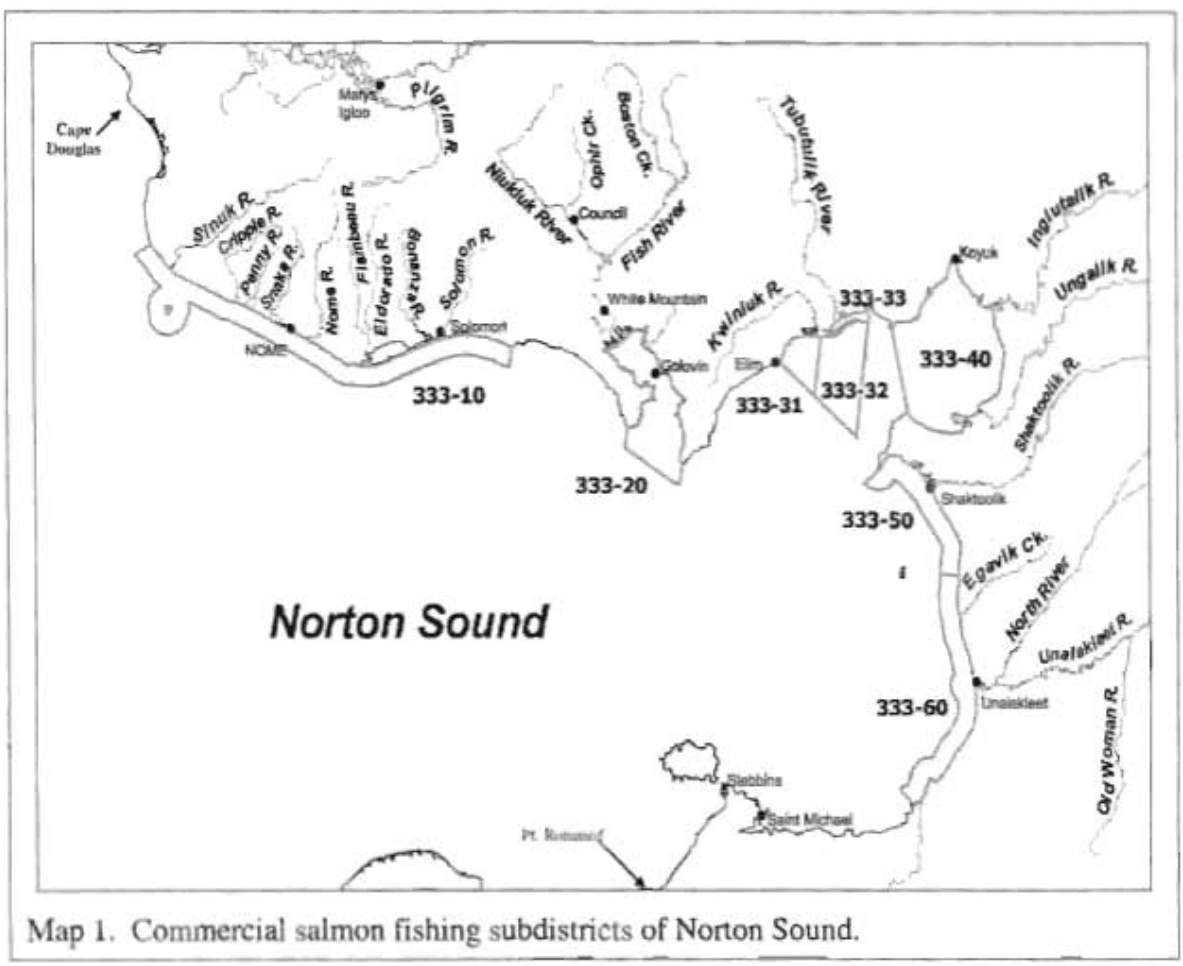
Basic regulation that governs the commercial salmon harvest in all districts is the scheduled weekly fishing period. Commercial fishing regulations provide two to four days of fishing per week during the open season depending on area and season. The Department attempts to distribute fishing effort throughout the entire return to avoid harvesting only particular segments of the return. Occasionally, fishing time is increased or decreased by emergency order. Managers issue these orders depending upon fishing conditions and strength of runs

or spawning escapements, as determined by evaluation of available run timing and abundance indicators. Weekly fishery reports, which give information on fishery status and fishing schedules, are broadcast during the fishing season over radio KICY and KNOM in Nome, and KOTZ in Kotzebue. Fishery news articles are published in the Nome Nugget and the Arctic Sounder.

NORTON SOUND DISTRICT

District Boundaries

Norton Sound Salmon District consists of all waters between Cape Douglas in the north and Point Romanof in the south. The district is divided into six subdistricts: Subdistrict 1, Nome; Subdistrict 2, Golovin; Subdistrict 3, Moses Point; Subdistrict 4, Norton Bay; Subdistrict 5, Shaktoolik; and Subdistrict 6, Unalakleet (Map 1, Figure 1). Each of these subdistricts contains at least one major salmon-producing stream. Subdistrict boundaries were established to facilitate management of individual salmon stocks.



Map 1. Commercial salmon fishing subdistricts of Norton Sound.

All commercial salmon fishing in the district is by set gillnets in marine waters; fishing effort is usually concentrated near river mouths. Commercial fishing typically begins in June and targets chinook salmon if sufficient run strength exists. Emphasis switches to chum salmon around June 25 and the coho salmon fishery begins the fourth week of July. By regulation, commercial salmon fishing closes after September 7. Pink salmon may be abundant on even numbered years. On even years, a pink directed fishery may replace or may be scheduled to alternate periods with the historical chum directed fishery.

Salmon management changed significantly during recent years because of limited market conditions and marginal returns of many salmon stocks within the northern portion of the district. Except for the Nome Subdistrict, commercial fishing can occur if salmon run sufficiently and a commercial market opens. Commercial fishing managers use estimates of run strength from escapement counting projects, test fishing, aerial surveys, and commercial fishing indexes. The Nome Subdistrict is managed intensively for subsistence use. Tier II subsistence permits, registration permits, closed waters, setting fishing period length, limiting gear and harvest limits are all tools that can be employed throughout the season to provide for escapement needs and to maximize subsistence opportunity.

Historical Fishery Use

Archeological evidence dating back 2,000 years indicate fishing has been a part of life for Norton Sound residents for many centuries (Bockstoce, 1979). The largest pre-contact settlements on the Bering Strait Islands and the Western Seward Peninsula were located where marine mammals were the primary subsistence resource. The rest of the region's population lived in small groups scattered along the coast, often moving seasonally to access fish and wildlife resources (Thomas 1982). During summer months residents would disperse usually in groups comprised of one or two families, and set up camps near mouths of streams. Harvest levels of fish on any one stream were relatively small because of the low concentrations of people who caught only what their families and one or two dogs needed through the winter (Thomas 1982).

A large scale fur trade was developed by the Russians in the late 1800s and continued after the American purchase (Magdanz 1981). The activities and support for hundreds of commercial whalers and trading ships caused trading to increase in the region around 1848 (Ray 1975). The increased competition for walrus, caribou, and other species from outsiders may have increased the importance of salmon to area residents (Magdanz 1981). In the late 1890s, gold was discovered on the Seward Peninsula and boom-towns sprang up with thousands of new immigrants flocking to the region. Year-round communities were with increased commercial activity.

Mining impacted fish populations significantly. Nearly every stream on the Seward Peninsula had some sort of mining operation working on it which ranged from simple gold panning to sluice boxes to hydraulic giants to bucket line dredges. One example of extensive impact is on the Solomon River, which is only 30 miles long but had 13 dredges working at one time. Another obvious impact was simply the large number of people who

came to live in the region between 1900 and 1930. Communities like Nome, with a population of 30,000 and Council once with 10,000 people, did not exist before gold was discovered.

In the late nineteenth century the size of the dog teams increased from two or three to as many as ten to twenty. At about the same time, wooden boats began to replace kayaks (Thomas 1982). Consequently, the demand for dry fish to feed the dog teams increased along with the development of better means to harvest fish. Winter transportation throughout the region was hired dog teams and drivers who carried mail or freight along the coast and across the state to the ice-free port at Seward. Dry fish became a major barter item in response to the increased demand for dog food, primarily chum and pink salmon (Thomas 1982).

Local residents spent most of their summers catching and drying large amounts of salmon, some of which they kept for themselves and the rest they bartered or sold to mining camps, roadhouses, and trading posts or stores. For example, the Haycock mining camp on the Koyuk River bought about two tons of dry fish each year. Roadhouses were located at Golovin, Walla Walla, Moses Point, Isaac's Point, Ungalik, Robertvale, foothills (south of Shaktoolik), Egavik, and other locations. Dry fish was bought in units of bundles (50 dry fish tied together) at a typical price of 10 cents per pound from the fishers. One elder in the area thought more fish were retained for personal use compared to the average five to ten bundles sold per household (Thomas 1982).

The number of people gradually decreased over the next twenty years after the gold rush and the gold deposits were worked out. The number of dog teams diminished by the mid 1930s when mail planes and mechanical tractors were introduced. The last dog team mail contract ended in 1962 at Savoonga. Local stores continued to trade and barter in dry fish at Shaktoolik, Saint Michael, Unalakleet, and Golovin. An example of quantity was the 8x20x40 feet cache at the Shaktoolik store filled to the top with dry fish. One elder said the stores would buy the fish for 6 cents a pound and sell them for 10 cents a pound or their equivalent in groceries and supplies (Thomas 1982). By the early 1960s, commercial salmon fishing developed into a source of summer cash and snowmachines were replacing the need for dog teams (Thomas 1982). The use of dry fish to feed dogs decreased and cash became more available for exchange at stores.

Commercial Fishery Overview

Commercial salmon fishing in this district first began in the Unalakleet and Shaktoolik Subdistricts in 1961. Most of the early interest involved chinook and coho salmon flown in dressed condition to Anchorage for further processing. A single U.S. freezer ship purchased and processed chum and pink salmon during 1961. In 1962, two floating cannery ships operated in the district and the commercial fishery was extended into the Norton Bay, Moses Point and Golovnin Bay. The peak in salmon canning operations occurred in 1963.

Since then, markets have been sporadic and some subdistricts have often been unable to attract buyers. A joint venture between KEG (Koyuk-Elim-Golovin) Fisheries and NPL Alaska, Inc., operated from 1984 until mid-season in 1988. Two Japanese freezer ships were permitted to buy directly from domestic fishers limited to salmon caught in the internal waters of Golovin and Norton Bays. Currently, the most consistent markets are at Unalakleet and Shaktoolik where some onshore processing usually occurs.

The commercial salmon fishing season usually opens by emergency order between June 8 and July 1, but depending on run timing within each subdistrict. The season closes by regulation after August 31 in Subdistricts 1, 2, and 3, and after September 7 in Subdistricts 4, 5, and 6, but processors often terminate their operations before the regulatory closure dates. Up to two 48-hour fishing periods can occur each week unless changed by emergency order, with the exception of the Moses Point Subdistricts, where two 24-hour fishing periods can be scheduled each week. No commercial salmon periods have opened in the Nome Subdistrict since 1997 because of lower fish runs.

Commercial fishing gear is restricted to set gillnets. A maximum aggregate length of 100 fathoms allowed for each fisher. No mesh size or depth restrictions are enforced during normally scheduled periods. However, mesh size is often restricted in an attempt to harvest a specific species of salmon. Most gillnets fished are approximately 5 7/8 inch stretched measure. Unalakleet and Shaktoolik Subdistricts, 8 1/4 inch stretched mesh gillnets are commonly used during the chinook salmon run in June through early July. During years when large pink salmon runs occur and a market opens, the department provides fishing periods when only 4 1/2 inch mesh nets or less may be set or drifted. These special small mesh periods are an attempt to target pink salmon without over harvesting the larger sized salmon species.

Most fishers do not tend their nets continuously once they are set, leaving them unattended overnight. Fish quality suffers coincidental to the length of time fish may be left in the nets and is especially poor when storms prevent fishers from checking their gear for extended periods.

Commercial Fishery Management

The Norton Sound District is managed on comparative commercial catch data, escapements and weather conditions. A single factor or combination of factors may lead managers to issue of emergency orders affecting seasons, fishing periods, allowable mesh size, and areas.

Aerial surveys are used to monitor escapements in most Norton Sound streams. Weather conditions, time of day, type of aircraft, water conditions, bottom conditions, date of survey, and efficiency of the surveyor and pilot must be taken into account when making inter-annual aerial survey comparisons. Counting towers and weirs are a more consistent and accurate method of obtaining escapement information and are utilized on several river systems in Norton Sound. Four counting towers and three weirs were operated in 2002. Two of these weirs started as counting towers and later converted to weirs.

The commercial fishing season begins with chinook salmon in mid to late June if run strength is sufficient. Emphasis switches to chum salmon in late June or early July, then gradually shifts to coho during the fourth week in July. Pink salmon are abundant during even numbered years, but often no market opens for this species. The southern Norton Sound Subdistricts 5 and 6 (Shaktoolik and Unalakleet) have maintained commercial fisheries that target chinook, chum, and coho salmon, with coho salmon catches remaining fairly stable while chum and chinook salmon catches have been declining. Management consisted of a series of emergency orders to open and close fishing seasons and periods, adjust fishing time, and restrict mesh size.

Commercial fisheries in Subdistricts 2 and 3 (Golovin and Moses Point) target chum salmon and pink salmon during even numbered years. The commercial chum salmon harvest dropped dramatically since the mid-1980s. Poor chum salmon runs resulted in restrictive management actions during recent years. Seasons were closed by emergency order to allow for escapement and subsistence needs.

Little or no commercial salmon have been harvested in Subdistricts 1 and 4 (Nome and Koyuk) since the early 1980s. The Nome Subdistrict has had very depressed chum salmon stocks, which in recent years require closure or severe restrictions on the subsistence fishery. Conversely, the Norton Bay Subdistrict often has healthy stocks, but has been unable to attract markets willing to operate in this remote area.

Subsistence Fishery Overview

Household subsistence harvest surveys were not conducted district wide in Norton Sound from 1985 to 1993 because of budgetary restrictions. Since 1994, the department has conducted an annual subsistence salmon harvest assessment effort in northwest Alaska to provide more extensive, complete, and reliable salmon harvest estimates than previously existed. These household subsistence harvest surveys are primarily funded by the Commercial Fisheries Division and were conducted by the Division of Subsistence during the fall in eight Norton Sound villages. Subsistence harvest estimates for the district are generated from the data gathered by the survey project.

Daily surveys of Unalakleet River and ocean subsistence fishers have been conducted annually since 1985 during the chinook salmon run. Although total harvests by subsistence fishers were not documented, effort and catch information were used to judge timing and magnitude of the chinook salmon return. The commercial fishery is delayed until it becomes apparent subsistence needs are being met and chinook salmon are beginning their upstream migration as indicated by the Department of Fish and Game test net in the lower Unalakleet River. Since the early 1990s some subsistence nets are fished in the ocean to avoid large debris loads from spring runoff.

Low salmon stock levels in the Nome Subdistrict combined with a large concentration of users has required subsistence harvest permits since 1974. Permits are issued by regulation

to each household and designated fishing location which may have its own catch limit per permit, and the fisher is allowed to change locations after notifying the local Fish and Game office. After the fishing season, households are required to return the completed permit to the department, whether or not they actually fished.

Regulatory Actions in Nome Subdistrict

Although pink salmon are usually the most abundant species of salmon in Subdistrict 1 streams, the commercial fishery primarily targeted chum salmon during the 1970s. The relatively large chum salmon catches in this subdistrict in conjunction with weak local abundance implied the fishery intercepted non-local stocks. A 1978-79 Norton Sound stock separation study confirmed this view. Salmon tagged near Nome were re-captured in fisheries from Golovin (Subdistrict 2) to Kotzebue. In an attempt to provide for spawning requirements and to provide for an important subsistence fishery that targets local stocks, a commercial harvest guideline of 5,000-15,000 chum salmon was adopted as a regulation.

The Board of Fisheries, in response to an advisory committee petition, directed the Department to manage the commercial fishery for optimal chum salmon escapement after the poor chum salmon escapement during the 1982 and 1983 seasons. During the 1984 fall Board of Fisheries meetings, the directives in practice that season became regulation. In response to public and advisory board proposals, the following commercial fishery restrictions were adopted as regulations:

1) Salmon may be taken commercially only from July 1 through August 31.

2) Fishing periods were restricted to two 24-hour periods per week.

3) Waters west of Cape Nome were closed to commercial salmon fishing to allow for rebuilding of the river stocks that supported the historical subsistence effort.

The Department was also directed to allow a harvest at the lower end of the guideline harvest range of 5,000 to 15,000 chum salmon, as stipulated in 5AAC 04.360. In addition to these restrictions, a proposal to restrict the sport fishery in the Nome and Snake Rivers was adopted in 1984:

> With a bag and possession limit of 15 salmon, other than chinook salmon only 5 could be chum and coho salmon, in combination.

Subsistence permit limits in the Nome and Snake Rivers were restricted to 20 chum and 20 coho salmon. The remainder of the permit limit could be filled with salmon other than chum or coho salmon.

However, even with these restrictive regulations in place, chum salmon escapement goals were difficult to attain. The 1987 fishing season experienced poor returns of both chum and

pink salmon to Nome Subdistrict streams. Numerous management actions were made to curtail commercial fishing activities: and later, sport, personal use, and subsistence were restricted. Even with such drastic fishery restrictions, escapement goals for chum salmon were not attained during 1987 in the Nome, Eldorado, Flambeau, Bonanza, Snake, and Solomon Rivers. In response to this continuing trend of decreasing chum and pink salmon returns to the Nome Subdistrict, several new regulations were adopted by the 1987 Alaska Board of Fisheries.

At that time with the commercial fishery all but eliminated, proposals affecting the sport, personal use, and subsistence fisheries were considered. The following sport fish regulations were adopted for all Nome area road system streams (Seward Peninsula drainages from Cape Prince of Wales to Cape Darby):

1) For salmon other than chinook, 10 per day, 10 in possession, only 3 which may be chum salmon and coho salmon, in combination.

2) For chinook salmon, 1 per day, 1 in possession.

These new regulations superseded those adopted in 1984. Additional new regulations affecting personal use and subsistence fishers adopted in 1987:

1) In the Nome River, no person may operate more than 50 feet of gillnet in aggregate.

2) Nome River was added to regulation 5AAC 01.170 (e) which states small mesh gillnets (less than 4 ½ inch mesh) and beach seines may not be used in specific Nome Subdistrict streams.

Regulation changes in 1992 restricted the use of beach seines in the Nome Subdistrict. The managers were given authority to permit subsistence harvest of chum or pink salmon by beach seine if escapement needs were likely met. Beginning in 1991, no chum salmon harvests were allowed until escapement goals were likely to be met or conservative management actions were judged to be no longer effective. In the past, beach seines were viewed as an overly effective means to harvest fish, but during the last two years, beach seines were used to harvest abundant species, and allow the live release of other species experiencing depressed runs.

Nome Subdistrict was designated a Tier II subsistence salmon management area during a special meeting by the Alaska Board of Fisheries held in Nome, March 1999. Tier II permits are dispensed to individuals by fishing history, dependence, and the projected harvestable surplus. Through a series of Board of Fisheries directed meetings, the Board concluded the previous management plan did not provide adequate opportunity for all subsistence salmon users to supply their annual needs for chum salmon. As a result, the board allocated a subsistence priority to twenty individuals who applied and qualified for Tier II permits. The intent was to allow up to 30 permit holders first priority over other subsistence users if only a small harvestable surplus of chum salmon return. If the run was

assessed to be strong, then the subsistence fishery would open to all Alaskan residents who obtain a registration permit and individual harvests would be restricted to prescribed bag limits. In addition, the Board established "Closed Waters" areas where no subsistence salmon fishing would be allowed at any time to protect chum salmon on spawning grounds.

During a Board of Fisheries work session September 28-29, 2000, the Nome Subdistrict chum salmon stock was determined a management concern and the Golovin and Moses Point Subdistricts chum salmon stock was determined a yield concern.

The Board of Fisheries made several changes to regulations for management of Norton Sound salmon at the January 2001 meeting. In the subsistence fishery, the Board included another gear type, a line attached to a rod or pole, as legal fishing gear from Cape Espenburg on the northern Seward Peninsula along the coast to Bald Head (between Elim and Koyuk) and all inland waters between those points. Bald Head is the western boundary of the Subdistrict 4 (Figures 1 and 2). Therefore, in the Port Clarence District and in the Norton Sound District, from Cape Douglas to Bald Head, a fishing pole is legal subsistence gear. Although a fishing pole can now be used for subsistence fishing, sport fish methods and means requirements will still apply as to the harvesting of fish, for example no snagging of fish. The sport fish bag and possession limits, by species, as specified in 5 AAC 70.022 also apply, except when fishing through ice or when a subsistence salmon permit is required, and the harvest limits specified in the subsistence permit will apply. However, fishers cannot combine sport fish bag and possession limits with subsistence harvest permit limits.

The Board repealed the existing Biological Escapement Goals (BEGs) in regulation and adopted Optimal Escapement Goals (OEGs) for chum salmon for five Norton Sound rivers. In the past, escapement goals were in aerial survey counts of salmon. Aerial surveys do not count all salmon present, but serve as an index to compare current and previous surveys. The new OEGs are in actual number of fish. Four of the five OEGs were established for rivers where an escapement project (tower or weir project) is operated. The Board-established OEGs:

Subdistrict 1
Snake River: 1,600 – 2,500 chum salmon
Nome River: 2,900 – 4,300 chum salmon
Eldorado River: 6,000 – 9,200 chum salmon

Subdistrict 3
Kwiniuk River: 11,500 – 23,000 chum salmon
Tubutulik River: 9,200 – 18,400 chum salmon

The Board closed the commercial chum salmon fishery in the Nome Subdistrict and the fishery may not be reopened again until the abundance of chum salmon has a harvestable surplus large enough to meet subsistence needs for four consecutive years.

The department was given the authority to establish subsistence gillnet mesh size restriction of 4½ inch or less by emergency order when necessary to conserve chum salmon in Subdistricts 1, 2, and 3. The Board closed the Cripple and Penny Rivers to subsistence fishing for chum salmon. Also, the Nome and Solomon Rivers were closed to subsistence fishing for Arctic grayling, where abundance was determined to be low.

2002 Norton Sound Salmon Fishery

Commercial Fishery Summary

The 2002 Norton Sound commercial salmon season was the poorest season on record. The fishing season began in late July, one month later than usual, due to weak chinook and chum runs in eastern Norton Sound (Figures 1 & 2). In northern Norton Sound, a chum fishery would have been possible in early July in the Golovin and Elim Subdistricts, but the sole buyer had mechanical difficulties with tenders and was unable to purchase fish in those locations until late July. The commercial season ended 3 weeks before the regulatory closure on September 8, because of below average coho salmon returns. Commercial fishing time and areas were set throughout the season by emergency order. The combined commercial harvest of all salmon species and the number of commercial permits fished was the lowest on record. The 2002 fishery value to the fishers of $2,941 was the lowest on record. The previous low value was in 1965 when $21,483 was paid to commercial permit holders.

Appendix Table A8 lists the Norton Sound salmon historical and current year commercial harvests relative to the recent 5-year (1997-2001) and the recent 10-year (1992-2001) averages. The total salmon harvest was poor for all salmon species. The coho salmon harvest of 1,759 was 93% below the recent 5-year average, and 96% below the recent 10-year average. There was no buyer for pink salmon in 2002 as the forecast called for a harvest of 150,000 to 250,000 pink salmon and the buyer needed a forecast of 500,000 or greater before they would be interested. No chinook or chum salmon directed periods were opened, and harvest of these species was incidental during the coho fishery. The 2002 chinook salmon harvest of 5 was the lowest on record and was 99% below the recent 5-year and 10-year average harvests. The chum salmon commercial harvest of 600 was 95% below the 5-year and 10-year averages. The low harvest of 2,365 salmon can be attributed to the low salmon runs, no buyer in certain areas, and low participation by permit holders. Only 12 permit holders participated in the commercial fishery. The previous low participation was the preceding year when 51 permit holders fished. The previous 5-year average was 75 permits fished and the previous 10-year average was 95 permits fished.

Only one salmon buyer operated in Norton Sound during the 2002 season. The Unalakleet fish plant operated by Norton Sound Seafood Products was the base of commercial fisheries operations. Salmon were delivered to the Unalakleet dock and tendered from the neighboring Shaktoolik Subdistrict.

The average price paid for chinook salmon was $.39 per pound, $.20/lb for coho and sockeye, and $.07/lb for chum salmon. The total value of the raw fish reported on fish tickets in 2002 was $2,941.00. This amount was over 98% below the recent 5-year and 10-year averages (Appendix A11).

Subsistence Fishery Summary

Daily interviews of Unalakleet River and nearby ocean subsistence fishers were conducted at Unalakleet during the early portion of the fishing season to monitor the chinook salmon return. The verbal catch and effort information was used in combination with the Department's test net in the lower Unalakleet River to evaluate the timing and magnitude of the chinook salmon return. This information is the basis for scheduling initial commercial salmon fishing periods in the Unalakleet and Shaktoolik Subdistricts. Commercial fishing is typically only allowed after chinook salmon are observed entering the Unalakleet River in increasing numbers for a week's time. This time frame assures the harvest is directed on an actively migrating stock (rather than milling fish), allows adequate available quantities for subsistence users, and it helps to minimize the intercept of salmon bound for the Yukon River. There was no commercial chinook periods were scheduled in 2002 because subsistence fishers reported low catches, the test net catch was less than half the normal catch, and low numbers were reported at the North River tower.

Subsistence fishing permits are required by regulation for each household that fishes in the Nome Subdistrict. These permits are specific to a body of water with specific bag limits, and type of gear to be used. The permit holder records catches in numbers of each species of fish for each day fished on a catch calendar. If the subsistence fishers filled their harvest limits or want to fish another location, they request another permit for another area after the earlier one is returned. These permits are important to management because they identify users and harvest limits, but the actual catch information cannot be compiled until well after the season when the permits are returned to the Department of Fish and Game.

In 2002, 53 fishers applied for a Tier II permit. After scoring the applications, a subsistence priority went to forty individuals who applied and qualified. Two of the forty qualified Tier II permit applicants notified the department they would be unable to fish and the next two applicants were allowed to receive Tier II permits. The intent was to allow Tier II permit holders priority over other subsistence users should only a small harvestable surplus of chum salmon return. If the run was assessed to be strong, then the subsistence fishery would open to all residents of Alaska who obtain a subsistence salmon fishing permit and individual harvests would be restricted to prescribed bag limits as stated above.

Season Summary by Subdistrict

Nome - Subdistrict 1. The commercial salmon season in the Nome Subdistrict is scheduled to take place by regulation between July 1 and August 31. However, at the January 2001 Board of Fisheries meeting, commercial fishing for chum salmon was indefinitely closed and will be reopened only after the harvestable surplus of chum salmon has met Tier I subsistence needs for four consecutive years. No salmon were commercially harvested because of inadequate surpluses of pink, and coho salmon (Table 1). During the 2002 season, 38 Tier II permits and 106 Tier I subsistence fishing permits were issued. Two individuals eligible for Tier II permits did not pick them up. Some individuals were issued both permit types and multiple permits for different fishing locations. Harvest results for the 2002 subsistence fishing are listed in Tables 2, 3 and 7.

Subsistence fishing was closed by emergency order, in mid-June, early in the chum run, to all Tier I and Tier II fishers. Tier II fishing was only allowed in marine waters east of Cape Nome for three days per week beginning on June 25. The Board of Fisheries intended to allow more fishing time to Tier II permit holders early in the season when weather conditions are typically more suitable for processing salmon using traditional methods. The Board's intent was to limit the number of fishers, thereby reducing the risk of overharvest early in the run before full assessment. The chum salmon run to the rivers west of Cape Nome was poor. Fishing was restricted to Tier II fishers east of Cape Nome in marine waters until early July. The first week of July, the counts from the Eldorado River tower indicated a strong pink run and restricted mesh gillnet fishing by Tier I permit holders was also allowed in the marine waters east of Cape Nome. By July 4 nearly 20,000 pink salmon had passed the Eldorado tower. Tier I beach seining was allowed periodically in the fresh waters of Safety Sound beginning on July 6. In early July chum salmon escapement past the Eldorado River tower was tracking ahead of previous years. Tier II fishing was allowed in the Eldorado and Flambeau Rivers beginning July 4. The fresh water subsistence fishing periods were the earliest openings in over 5 years in Nome Subdistrict.

West of Cape Nome, chum and pink runs were not strong and fishing was not allowed until later in July. In mid-July when pink escapement was assured at the Nome River, Tier I beach seining for pinks was allowed on the Nome River. Tier II fishing periods were allowed on the Snake River when chum salmon escapement was projected to reach the escapement goal. On July 22, all fresh water subsistence harvest areas of the Nome Subdistrict were opened to all subsistence fishers because most chum salmon were now on the spawning grounds. However, Nome River was restricted to only beach seining and chum salmon were required to be returned to the water.

The subdistrict reopened in both marine and fresh waters to all Tier I and Tier II fishers on July 29 to target coho salmon. The coho salmon return was initially believed late, but later was assessed to be below average. In mid-August, the Nome Subdistrict was closed to

subsistence salmon fishing for two weeks. Improvement in the coho salmon escapement allowed the reopening of the subdistrict, except for the Snake and Solomon Rivers, to subsistence fishing in late August.

Golovin - Subdistrict 2. The 2002 Salmon Management Plan stated that the Golovnin Bay Subdistrict commercial harvest would be limited to a maximum of 15,000 chum salmon before mid-July to protect chum salmon stocks and allow for some harvest while flesh quality is at its best. By that date, the chum salmon run could be assessed and fishing time adjusted accordingly.

No chum salmon were commercially fished in Subdistrict 2 because no buyers were available during the chum salmon run. No coho were commercially fished because of a weak run. The Niukluk and Fish Rivers had subsistence fishing restricted to four days a week for three weeks in late August and early September. Improved coho escapement counts allowed the normal seven days per week subsistence fishing schedule in fresh waters to resume the second week of September.

Moses Point - Subdistrict 3. The Moses Point Subdistrict chum salmon return has experienced below average runs despite conservative management actions taken over the last ten years. At the Board of Fisheries meeting in January 2001, the escapement goals for the Kwiniuk and Tubutulik Rivers were revised to account for recent Biological Escapement Goal (BEG) analysis. The Board established an Optimal Escapement Goal (OEG) for each river that was lower than its previous escapement goal. The previous escapement goal range was 15,600 to 31,200 chum salmon and the revised optimal escapement goal range is 11,500 to 23,000 chum salmon. In 2002, the escapement past the Kwiniuk tower was 778 chinook salmon, 37,995 chum salmon, 1,114,410 pink salmon, and 6,459 coho salmon. Except for coho salmon, all escapements were well above average.

No salmon were commercially fished in Subdistrict 3 because no buyers were available during the chum salmon run. No coho were commercially fished because of a weak run.

Norton Bay - Subdistrict 4. The Norton Bay Subdistrict typically has difficulty attracting a buyer because of its remoteness and its reputation for watermarked fish. Consequently, regulatory changes were implemented to move the western boundary from Six Mile Point to Isaac's Point in 1995 and the eastern boundary out to Point Dexter in 1998 to improve fish quality. Because of timely salmon escapement information, the Norton Bay Subdistrict is typically managed similar to the Shaktoolik and Unalakleet Subdistricts because they reflect similar trends in salmon return strength and timing. In 2002, no commercial salmon fishing occurred because of marginal salmon runs and no buyer interest.

Shaktoolik and Unalakleet - Subdistricts 5 and 6. The Shaktoolik and Unalakleet Subdistricts, which share a common boundary, consistently attract commercial markets because of large volumes of fish and better transportation services. Management actions typically encompass both subdistricts because salmon tend to intermingle and the harvest in one subdistrict affects the movement of fish in the adjacent subdistrict. As stated earlier, the

department's test net in the Unalakleet River and subsistence interviews at Unalakleet are used to set early fishing periods in both subdistricts. As the season progresses, test net catches, commercial catch indices, and the North River counting tower are used to assess run strength of each salmon species. Aerial surveys are frequently not obtained in either subdistrict because of poor survey conditions and are only useful for late season escapement assessment because of the long travel time between the fishery and the spawning grounds (Table 4).

Commercial fishing is typically only allowed after chinook salmon have been observed entering the Unalakleet River in increasing numbers for a week to assure the harvest is directed on actively migrating stock and not on milling fish. In 2002, the chinook salmon run was weak as determined by subsistence net catches, test net catches, tower counts, and aerial surveys (Tables 4, 5, 6 and 7). The chum salmon run although not as weak as the chinook run, was also well below average. No chinook or chum salmon directed commercial fishing periods were opened.

On July 25, both subdistricts opened with a test period reduced to 24 hours duration compared to the normal 48 hour duration for coho salmon. A series of fishing periods were announced, each one separately, with reduced fishing time. Commercial fishing effort and catches continued to be low. Even with the reduced effort the CPUE (catch per unit of effort) continued to be below average. Only the August 8 fishing period had an above average CPUE, but catches and CPUE decreased in fishing periods thereafter. A final 24-hour test period on August 19 had a below average catch and CPUE, and the commercial season was closed.

The commercial catches in the Shaktoolik Subdistrict included 1 chinook, 680 coho, and 261chum salmon harvested by 7 permit holders (Tables 1 and 5). The coho salmon harvest was 84% below the recent 5-year average.

The Unalakleet Subdistrict total commercial catch harvested by 5 permit holders included 4 chinook, 1 sockeye, 1,079 coho, and 339 chum salmon (Tables 1 and 6). The coho salmon harvest was 95% below the recent 5-year average.

Escapement

Table 4 summarizes escapement assessments for the major index river systems of the Norton Sound and Port Clarence Districts. These assessments are often qualitative and relative to historical escapement sizes. Most of the chum salmon assessments are described relative to a Sustainable Escapement Goal (SEG) for an index area. An SEG is a level of escapement known to provide for sustained yields over a 5-to-10 year period, and is used in situations where a Biological Escapement Goal (BEG) cannot be estimated because a stock specific catch estimate is absent. A BEG is based on spawner-recruit relationships estimated to provide maximum sustained yield. The more formalized BEG has been established for the Nome Subdistrict chum salmon stock. SEGs have been established for seven of the nine individual streams in the Nome Subdistrict based on the historical average proportion of each stream's contribution to the composite Nome Subdistrict chum

salmon escapement. These SEGs are in expanded aerial survey counts. BEGs have been established for the chum salmon stocks that return to the Kwiniuk and Tubutulik rivers. At the January 2001 meeting, the Board of Fisheries established Optimal Escapement Goals (OEG) for the Eldorado, Nome, Snake, Kwiniuk, and Tubutulik rivers in the Norton Sound District. An OEG is a specific management objective for escapement that includes biological and allocative factors and may differ from the SEG or BEG. The Board of Fisheries places an OEG into regulation, and the department seeks to maintain escapements evenly within the bounds of the OEG.

Department escapement projects in Norton Sound include counting towers on the Kwiniuk and Niukluk Rivers, a test net operated on the Unalakleet River, and a weir on the Nome River. Norton Sound Economic Development Corporations (NSEDC) provides essential support for these projects. The Unalakleet test net and the Kwiniuk tower projects have been in operation for many years. They provide comparable and timely information used as a basis for inseason salmon management decisions. The Nome River weir first began as a counting tower project late in 1993 and was operational as a tower in 1994 and 1995 before switching to a functional weir in 1996. The Niukluk tower became operational in 1995. Both the Nome and Niukluk River projects have limited years of data that can be used when making comparisons, but have proven to be reliable and will become more valuable the longer they operate.

Four additional counting tower projects were operated in the management area this season. The Snake, Eldorado, and Pilgrim River projects were setup and operated by Kawarak Corporation and the North River project was operated by Unalakleet IRA. Bering Sea Fishermen's Association (BSFA) and NSEDC provided support to both organizations. These projects have operated since the mid-1990s and are cooperative ventures with the Department of Fish and Game, which provided technical advice. These projects supplied important daily information to the Department that was useful to the management of local salmon resources and will become more important the longer they operate.

Aerial survey assessment conditions were fair to good in most subdistricts. As usual, the Nome Subdistrict streams received the most intensive assessment efforts because salmon stocks local to the Nome area are strictly regulated, easily accessed by road system, and are exposed to intense subsistence and sport fishing pressure.

Chinook Salmon. The 2002 chinook salmon run was below average throughout most of Norton Sound. Rivers of the Unalakleet and Shaktoolik Subdistricts are the primary chinook salmon producers in Norton Sound. The eastern Norton Sound rivers generally produce larger runs and support larger harvests. Aerial surveys of chinook salmon were incomplete because of poor conditions. The Unalakleet test net catches, the North, Kwiniuk and Niukluk towers, and subsistence reports were the primary assessment tools for judging chinook salmon run strength. The Unalakleet test net catch was approximately 50% below average and the North River tower was also below average, but the chinook escapement counts did reach the low end of the SEG for the North River. Subsistence fishers in the Shaktoolik and Unalakleet Subdistricts reported longer than normal time to reach their chinook harvest goal. The escapement of chinook past the Kwiniuk tower was well above average and the Niukluk River tower count was a record although the chinook salmon runs are much smaller in those rivers.

Chum Salmon. Chum salmon escapements were below average throughout most of the management area in 2002. Survey conditions were good in the Nome Subdistrict and chum salmon escapement goals were achieved in two of the three rivers with established OEGs. The Niukluk counting tower is used as an index for the Golovnin Bay Subdistrict. The tower has operated since 1996 and estimated chum salmon passage was one-quarter below the recent 5-year average and less than half the escapement in 1996 and 1997. However, the Kwiniuk tower in the Moses Point Subdistrict had a chum salmon count that was fifth highest in the last 20 years and double the recent 5-year average. An aerial survey of the Tubutulik River was conducted under poor conditions and cannot be used to judge whether the OEG was met. The Unalakleet River chum salmon escapements were below average based on test net catches and the North River chum salmon escapements were average based on tower counts.

Coho Salmon. Coho salmon are found in nearly all of the chum salmon producing streams throughout Norton Sound, the primary commercial contributors are the Unalakleet and Shaktoolik Rivers. Because inclement weather is normally experienced in this area during August and September, escapement data can be somewhat incomplete. Streams in the northern subdistricts of Norton Sound are typically surveyed. The more recent Nome area escapement assessment projects are intended to monitor coho salmon and chum salmon and are becoming more important to fisheries management. The coho salmon return to Norton Sound was below average and continued the pattern of below average returns in recent years. Subsistence restrictions were implemented in the Nome and Golovin Subdistricts, and the Port Clarence District, and reduced commercial fishing time occurred throughout the Norton Sound District. Weak escapement of coho salmon by mid-August resulted in a subsistence closure of two weeks in the Nome Subdistrict and Port Clarence District and reduced fishing time for three weeks in the Fish and Niukluk rivers in the Golovin Subdistrict. Sport fishing for coho salmon was closed in mid-August in the Nome Subdistrict, and the Pilgrim and Kuzitrin Rivers in the Port Clarence District, and as far south as the Unalakleet River the coho salmon bag limit was reduced to one coho per day. Restrictions on fishing enabled some rivers to reach coho salmon escapement goals. In the Unalakleet River, test net catches indicated a late push of coho salmon in early September and the cumulative test net catch ended above the seasonal average. An aerial survey of the

North and Niukluk Rivers indicated that escapement had been reached. Escapement counts at the Nome River weir improved enough to allow for limited subsistence and sport fishing. Escapements on other rivers remained poor and the Snake and Pilgrim Rivers remained closed when subsistence salmon fishing was reopened in late August. However, with the fisheries restrictions in Norton Sound in 2002, most rivers had adequate escapement.

Pink Salmon. During recent years, pink salmon returns to Norton Sound have followed an odd/even year cycle, even-numbered year returns are typically much greater in numbers than the odd-numbered years. In 2002, escapements were highly variable, some rivers had high returns compared to the historical average and other rivers having had very low returns when compared to the historical average. The Kwiniuk River had an escapement of 1.1 million pink salmon, the third highest on record; and the Snake River had an escapement of 4,000 pink salmon, one of the lowest escapements on record for an even year return.

Sockeye Salmon. Sockeye salmon are typically found in small numbers throughout Norton Sound District. The largest stock spawns at Glacial Lake where approximately 1,000 fish return to spawn each year. Port Clarence, the salmon district immediately to the northwest of Norton Sound, has had a spawning population near 10,000 fish in recent years at Salmon Lake. No commercial fisheries targeted these stocks in many years because of their low abundance and importance to subsistence users. In 2002, the sockeye run was below average. Several aerial surveys made of Glacial Lake estimated a peak of 330 sockeye salmon. The estimate was below the aerial survey escapement goal of 800 to 1,600 sockeye salmon. However, poor weather reduced the effectiveness of aerial surveys at Glacial Lake. A weir operated by the U.S. Bureau of Land Management (BLM) at the outlet of Glacial Lake counted 1,047 sockeye salmon into Glacial Lake. Several aerial surveys made of Salmon Lake estimated a peak of 3,520 sockeye salmon observed on August 23, which was below the escapement goal of 4,000 - 8,000 sockeye salmon.

2003 Norton Sound Salmon Outlook

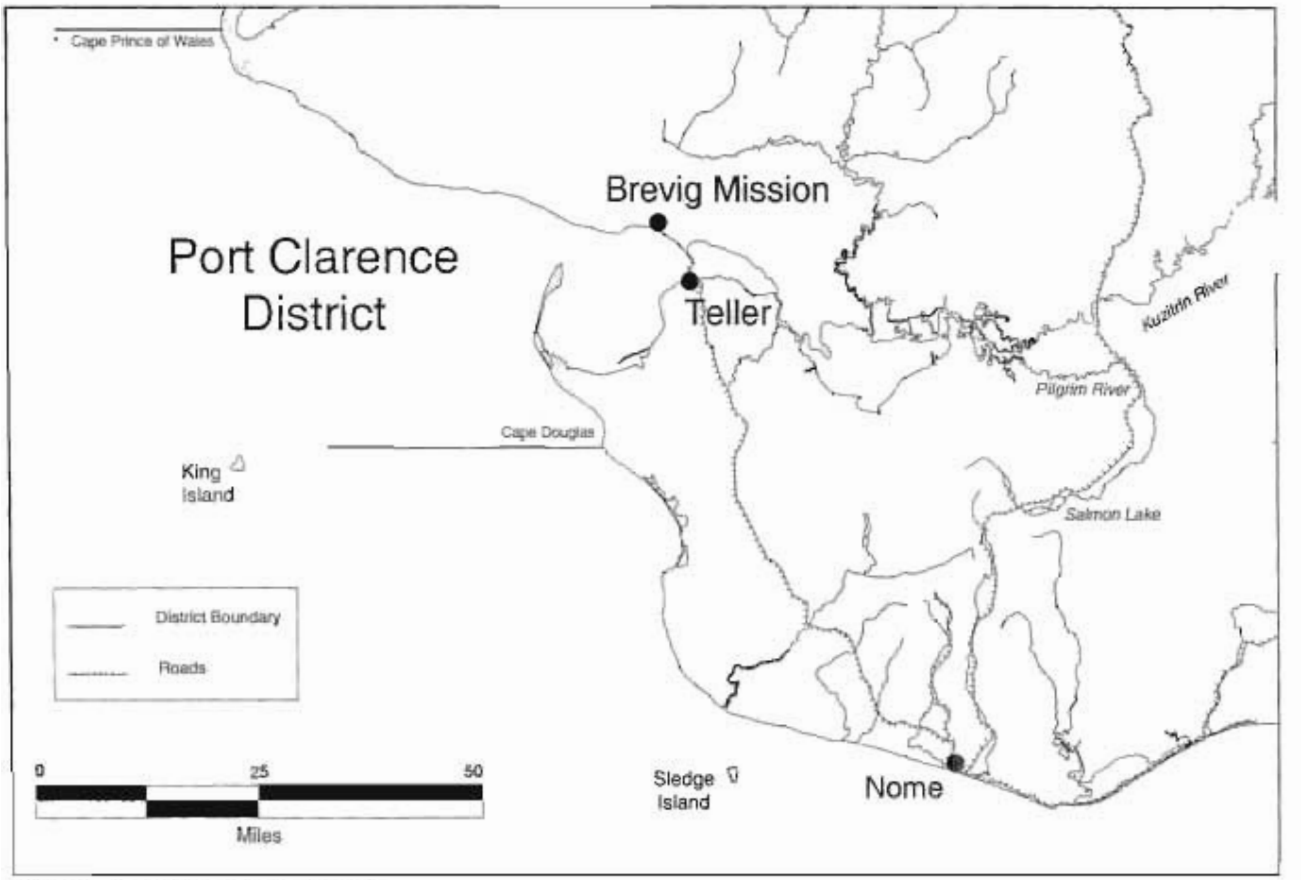
Salmon outlooks and harvest projections for the 2002 commercial salmon season are based on qualitative assessments of brood year returns, subjective determinations of freshwater over-wintering and ocean survival, and projections of local market conditions. Salmon buyers will probably operate in only some of the Norton Sound subdistricts during 2003. The chinook run is expected to have little harvest based on the poor runs of recent years. Limited or no chinook salmon periods may be directed. The expected commercial harvest from incidental catches and possible limited chinook fishing periods is from 0 to 1,000 fish. A pink salmon fishery will be unlikely in odd-numbered years, as there is insufficient harvest for major buyers to profit. Similar to the decline seen in other salmon runs in recent years, the 2001 pink salmon return was below average and strong returns of pink salmon in 2003 are unlikely. If sufficient buyer interest exists, pink salmon harvests may be 150,000 to 250,000 fish. The 2003 chum salmon run is expected to be below average. Additionally, the market for Norton Sound chum will likely be

minimal because of low demand and will also be dependent on buyer interest. Because of the expected below average chum salmon run, the commercial chum salmon fishery will be managed conservatively, but may provide a commercial harvest of between 10,000 and 25,000 fish. Based on the 1999 parent-year escapement, the 2003 coho salmon run is expected to be below average. Accordingly, the 2003 commercial harvest is anticipated to be below average. The commercial harvest is expected to range from 20,000 to 40,000 fish.

PORT CLARENCE DISTRICT

District Boundaries

The Port Clarence District encompasses all waters from Cape Douglas north to Cape Prince of Wales including the Salmon Lake and Pilgrim River drainage (Map 2, Figure 3). Salmon, saffron cod, whitefish and herring are the major subsistence species; however, this district has other fishery resources.



Map 2. Port Clarence District

Commercial Fishery

Commercial salmon fishing in this district has been prohibited since 1967. In 1966, a total of 1,216 salmon consisting of 93 sockeye, 131 pinks and 922 chums was taken commercially in the Grantley Harbor/Tuksuk Channel area. A few subsistence caught salmon are sold or bartered each year in Teller and Nome. Relatively small runs in this area and the existence of a subsistence fishery prohibit reopening commercial salmon fishing.

Subsistence Fishery

A traditional subsistence salmon fishery has probably occurred within this district for centuries; however, subsistence fishing has only been reported at Salmon Lake since the 1930s and monitored at the upper Pilgrim River since 1962. Data collected by Department personnel indicates most fishers of Brevig Mission fish the northern and northeastern sections of Port Clarence, and Teller fishers utilize Grantley Harbor and Tuksuk Channel. Interviews with local residents indicated substantial fishing effort within the Agiapuk River. Village subsistence surveys had been conducted annually by the Division of Commercial Fisheries up until 1983 (Appendix B1). Subsistence Division conducted a partial survey of Brevig Mission in 1989. The department has conducted full-scale household surveys of both villages since 1994.

Salmon Lake and Pilgrim River stocks have been fished by Nome residents in addition to residents of Brevig Mission and Teller. The Alaska Board of Fisheries adopted a regulation in 1972 to close Salmon Lake and its tributaries to subsistence salmon fishing from July 15 through August 31 to conserve declining sockeye salmon stocks. Subsistence salmon fishing permits are only required for the Pilgrim River drainage, but some fishers get permits for other Port Clarence drainages. Beginning in the 1991 season, an increase was observed in the number of subsistence permits issued to Nome residents intending to fish in the area, in part because of a strong sockeye salmon run. Extensive subsistence fishing closures in the Nome area made the Pilgrim River an alternative location to meet subsistence needs. In 2002, twenty eight households requested permits for the Pilgrim and Kuzitrin Rivers (Table 2). Some subsistence salmon fishing by Nome residents in the Port Clarence District may not be documented by household surveys or permit data.

The 2002 estimated subsistence salmon harvest in Port Clarence District was 12,152 fish (Georgette et al, 2003). Of the total harvest, 1% were chinook, 22% were chum salmon, 19% were pink, 21% were sockeye, and 13% were coho. A summary of the subsistence salmon harvest estimates by community is presented in Table 8.

The estimated mean harvest in the Port Clarence District was 69 salmon per household: 1 chinook, 15 chum, 19 pink, 21 sockeye, and 13 coho. Brevig Mission had a mean household harvest of 110 fish and Teller had a mean household harvest of 54 fish. Households with Pilgrim River permits harvested a mean of 8 salmon per household.

In the Port Clarence District, 55% of households subsistence fished for salmon in 2001. About 8% helped other households process subsistence-caught fish. Three percent of subsistence caught salmon were reported used for dog food. Set gillnets were used by 95% of the households to harvest salmon, rod and reel was used by 7%, and seine nets used by 6%. Approximately 16% of fishing households responded their chum fishing season was "poor", 58% said "average", and about 26% said the chum fishing season was "very good" (Georgette et al, 2003).

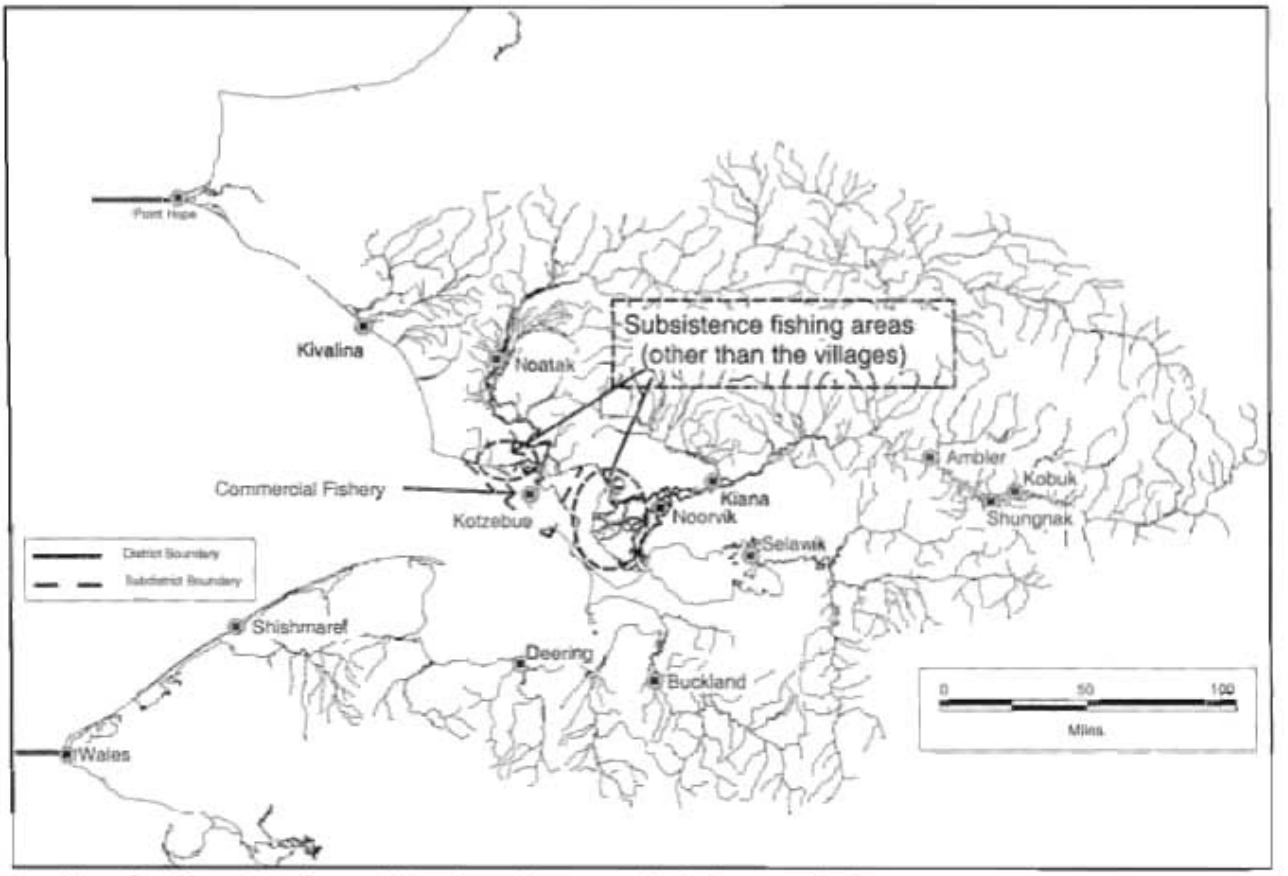
Escapement

Aerial surveys are not typically flown in this district, except Salmon Lake, because a higher priority is assigned to the Nome Subdistrict and surrounding areas of commercial fishing. Aerial surveys show an increasing trend of sockeye returns to Salmon Lake since 1986 (Appendix B2). In 2002, several aerial surveys were made of Salmon Lake, the peak estimate was 3,520 sockeye salmon observed on August 23, below the escapement goal of 4,000 - 8,000 sockeye salmon. The department had run a fertilization program at Salmon Lake partially funded by NSEDC and BLM from 1997 to 2001. The goal of the project was to apply liquid fertilizer to restore the sockeye population to historical levels, however the department could not adequately tell if the results were effective and suspended fertilization in 2002.

KOTZEBUE SOUND DISTRICT

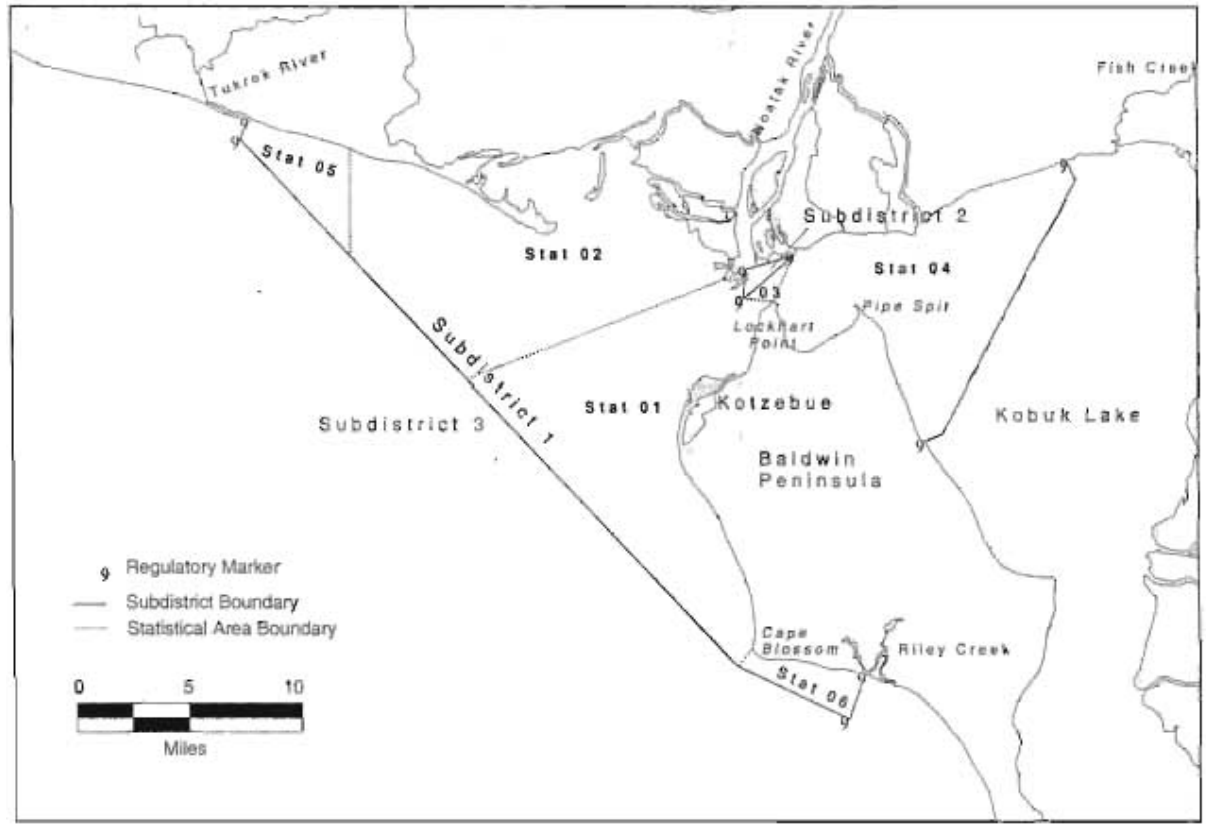
History

The Kotzebue Sound District supports subsistence fishing and the northernmost commercial salmon fishery in Alaska (Map 3, Figure 4). The Kotzebue District is divided into three subdistricts. Subdistrict 1 has six statistical areas where commercial salmon fishing occurs (Map 4, Figure 5).



Map 3. Kotzebue Sound District, villages and subsistence fishing areas.

The commercial fishery opened under state management in 1962. Salmon harvests consist primarily of chum salmon although limited amounts of Dolly Varden and a few chinook salmon are harvested during the salmon fishery. Only 3 of the 186 commercial permit holders in 2002 fished. During the recent ten-year period, 1992 to 2001, participation in the fishery averaged 82 permit holders, and during the recent five year period, 1997-2001, participation averaged 60 permit holders, of which 97 percent were residents of the state.



Map 4. Kotzebue Sound salmon fishing subdistricts and statistical areas

The earliest documented sales of salmon in the Kotzebue District were in 1909 when Lockhart's store purchased 21,906 pounds of salmon from local Native Alaskans and resold it at $0.05/lb. Of those sales, 21,366 pounds were sold to gold miners on the Kobuk River drainage and 540 pounds were sold to a company in Seattle. A commercial fishery occurred from 1914 to 1918. Salmon were canned and the bulk of the harvest was thought sold to miners working in the upper Kobuk River drainage. The next organized commercial fishery began under state management in 1962 and continues to the present. The current fishery became fully developed in the mid-70s. The fishery displayed a gradually declining pattern of overall run strength with four year cycles of stronger returns followed by weaker returns. In 1987, the fisheries managers' new program emphasized attaining escapement goals. Before 1987, harvests were proportional to total return. Since 1995, poor market conditions caused harvests to fall short of their potential, particularly in 1995 and 1996 when resulting escapements were strong. In 2002, harvests were below potential because a major buyer was lacking, and escapements were below average.

In 1981, a chum salmon hatchery was established at Sikasuilaq Springs, a tributary of the Noatak River. The hatchery was closed in 1995 because of lack of funding support. At peak production, the hatchery incubated 11,100,000 eggs in 1992. An estimated peak production adult hatchery return of 90,000 chum salmon occurred in 1997. The estimated contribution to the commercial fishery was approximately 50% in 1997.

General Information

A limited 2002 Kotzebue Sound commercial salmon season ended with a record low harvest and participation. The commercial harvest consisted of 8,390 chum salmon (Table 9). Only 3 of a possible 186 permit holders fished during the season. The overall chum salmon run to Kotzebue Sound in 2002 was estimated to be below average to poor in abundance based on the very low commercial harvest, lower harvest rates than normal, and the below average Kobuk test fish index.

The Kotzebue Sound commercial salmon fishery remained closed past July 10, the regulatory opening date, with no market. The fishery opened on July 18 when a limited market became available. The fishery closed by regulation after August 31, but the last fisher stopped fishing on August 24.

A total of 74,341 pounds of chum salmon (average weight 8.9 lbs) were sold at an average of $0.10 per pound. The total exvessel value was $7,572 to Kotzebue area fishers averaging $2,542 for each participating permit holder. This represents 1% of the $660,951 historical average (Appendix C1).

Gear in the commercial fishery is limited to set nets with an aggregate of no more than 150 fathoms per fisher. Fishers generally operate with one end on or near shore and with all three shackles connected. Fishers also set in deeper channels in the mud flats further out from shore. Most gear used in the district is 5-7/8 in (14.9 cm) or 6 in (15.2 cm) stretch mesh gillnet.

2002 Commercial Season Summary

Inseason Management

Primary fishery management objectives were to provide adequate chum salmon escapement through the commercial fishery to ensure a sustained run and to provide for the subsistence priority. A test fishery conducted on the Kobuk River for the tenth year provided the only inseason escapement information. Low participation by fishers and limited buying capacity allowed the fishery to remain open continuously while allowing management objectives to be met. Age-sex-length (ASL) data was not used to manage the fishery due to the low volume of fish harvested.

Season Narrative

The season was opened on July 18 by emergency order opening commercial fishing until further notice. One fisher signed up as a catcher/seller to supply fish to the small local

market. Starting the week of July 21 the same fisher became an agent for Great Pacific Fisheries. Great Pacific had limited orders for fresh Kotzebue chum salmon.

Two fishers fished each week from July 28 until August 17 to fill orders. Commercial fishing remained open continuously to allow fishers the maximum flexibility to harvest fish and meet airline shipping schedules. One fisher continued fishing the week of August 18. Fishers reported catch rates were below average overall for the season. Catch rates were reported good on August 9 and 10 then again August 22 to 24.

Subsistence Season Summary

In the Kotzebue Sound District, household surveys were only conducted in the villages of Noatak and Noorvik in conjunction with a big game harvest survey. The subsistence salmon harvest in the Kotzebue District was 16,955 fish (Table 11). Chum salmon made up nearly all of the catch with the remaining portion a mix of other salmon species, which are present in only small numbers in the district (Georgette et al, 2003).

The estimated mean salmon harvest was about 79 per household, nearly all chum salmon. Noorvik had a mean household harvest of 122 salmon, and Noatak's mean household harvest was 29.

In the Kotzebue District, 64% of households subsistence fished for salmon and about 7% assisted other households in processing subsistence-caught salmon. Thirteen percent of the subsistence harvest was used for dog food. Set gillnets were used by 49% of households for harvesting salmon, 48% of households used rod and reel, and 24% used a seine. However, rod and reel use accounted for less than 4% of the total salmon harvest in the two surveyed communities in the district.

In the Kotzebue District, 11% of the fishing households responded their chum salmon fishing season was "poor," 53% said "average," and 36% said "very good" (Georgette et al, 2003).

Escapement

A test fish project located just downstream from the village of Kiana monitored escapement into the Kobuk River. The test fish index of 875 was fourth lowest in the ten years the project has been in operation (Table 10, Figure 6). The lowest index recorded was 494 in 1993. Aerial surveys indicated escapement was adequate in 1993. In 2002, the Kobuk River test fish index did not follow the typical pattern. A larger than average number of index points were generated in the first half of the season and fewer than average number of index points were generated in the second half of the season indicating an early and below average escapement to the Kobuk River.

Test fishing was conducted in the lower Noatak River three times during the run by department and National Park Service staff to obtain chum salmon ASL samples. Fishing

on all three trips was described as slow. Both Kobuk and Noatak River ASL samples show a higher then normal percentage of 5-year-old fish throughout the season.

Only one aerial survey was conducted in the Kotzebue District in 2002 under unacceptable viewing conditions. One aerial survey was canceled because of weather and one survey was canceled because no airplanes were available.

2003 Outlook

The outlook for the 2003 season is calculated from the parent-year escapement and returning age classes observed in the 2002 run. During the 2003 season, the four-year-old and five-year-old component of the return is expected to be average. The three-year-old and six-year-old component is generally small, but are likely to be near average. The commercial harvest is expected to fall within the range of 50,000 to 100,000 chum salmon, if market conditions can accept that level of harvest.

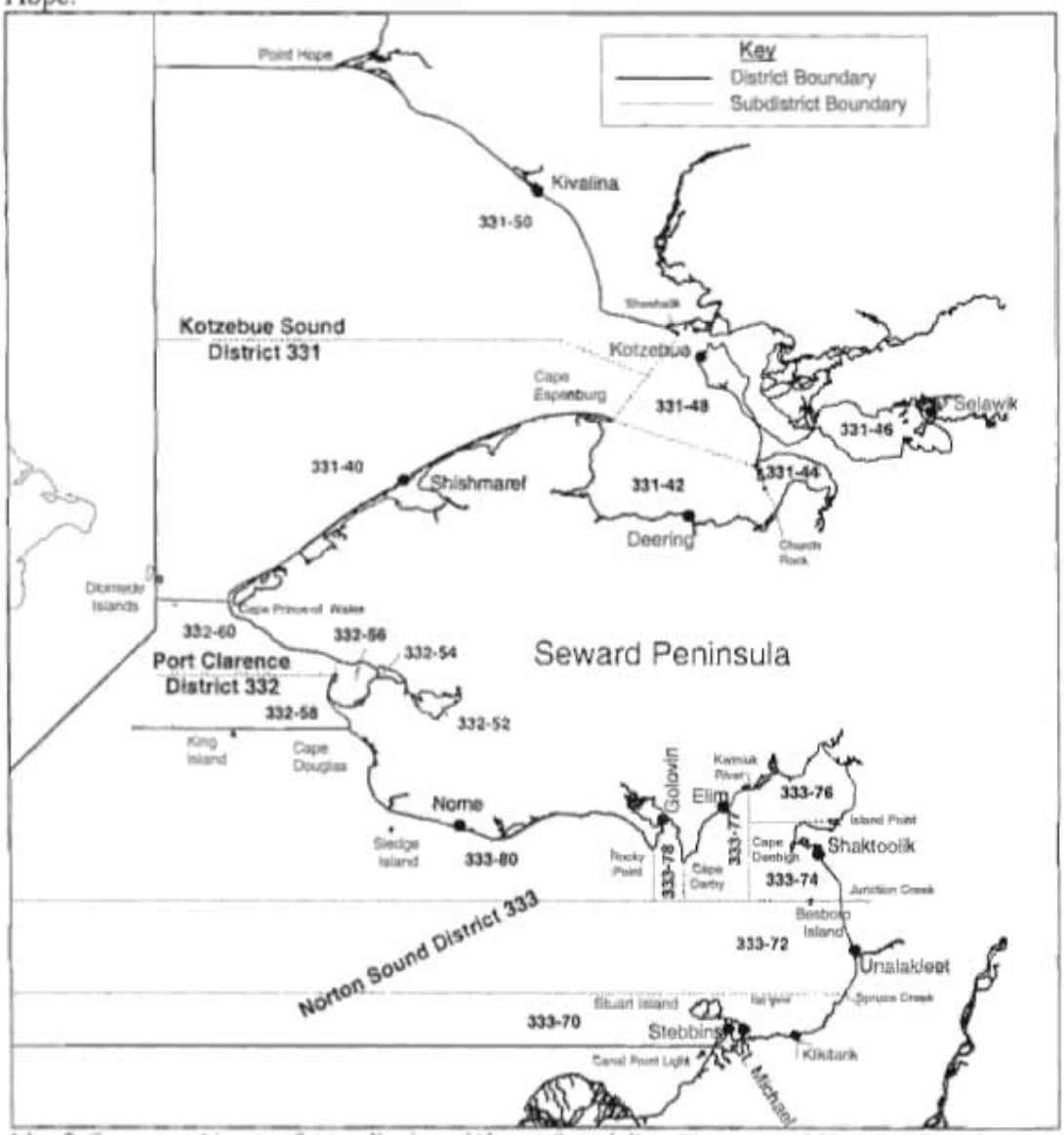
Section 2: PACIFIC HERRING

(Includes Norton Sound and
Port Clarence/Kotzebue Districts)

INTRODUCTION

Boundaries

The Norton Sound District consists of all waters of Alaska between the latitude of the western most tip of Cape Douglas and the latitude of Canal Point Light (Map 5, Figure 7). The Port Clarence District consists of all waters of Alaska between the latitude of Cape Douglas and the latitude of Cape Prince of Wales. The Kotzebue Sound District consists of all waters of Alaska between the latitude of Cape Prince of Wales and the latitude of Point Hope.



Map 5. Commercial herring fishing districts of Norton Sound, Port Clarence, and Kotzebue Sound.

Spawning Areas and Timing

Arrival of Pacific herring *(Clupea harengus pallasi)* on the spawning grounds is greatly influenced by climate and oceanic conditions, particularly the extent and distribution of the Bering Sea ice pack. Most herring spawning populations appear near the eastern Bering Sea coast immediately after ice breakup between mid-May and mid-June. Spawning progresses in a northerly direction and may continue into July or August along portions of the Seward Peninsula or within the Chukchi Sea.

The Norton Sound District has the largest abundance of herring in the Arctic-Yukon-Kuskokwim Region; the primary spawning areas are from Stuart Island to Tolstoi Point. When sea ice has remained in this area into June, spawning has been more extensive along Cape Denbigh and several locations along the northern shore of Norton Sound between Bald Head and Bluff. More northerly spawning areas have been more difficult to identify because of small herring stock sizes and limited investigations. Likely spawning areas include Imuruk Basin, Shishmaref Inlet, Deering-Kiwalik coast, and Hotham Inlet.

NORTON SOUND DISTRICT

Fishing History

Pacific herring were likely used for subsistence purposes by coastal residents well before the mid-1800s when their use was first documented by early explorers. The earliest American commercial effort on Bering Sea herring apparently took place in the early part of the 1900s at Golovnin Bay in Norton Sound (Appendix D1).

Food Herring

Early records indicate about 3,200 tons of "fall herring" were processed in Norton Sound from 1916 to 1941 (Appendix D1). This fishery, dependent on salt curing, declined because foreign competition produced poor marketing conditions. The Japanese began gillnetting in Norton Sound during 1968 with three vessels. Effort was concentrated about 12 miles offshore between St. Michael and Golovin. Approximately 40 Japanese vessels reported harvesting a record 1,400 tons of herring during 1969 (Appendix D2). An average annual harvest of approximately 440 tons was reported in Norton Sound by the Japanese during 1968-1974. The Japanese fleet was prohibited in 1977 from gillnet fishing in this area.

Sac Roe

Domestic commercial fishing resumed in Norton Sound in 1964 near Unalakleet and continued sporadicly until 1979. Between 1964 and 1978 the fishery averaged about 10 tons of herring annually and targeted "spring herring" for sac roe extraction (Appendix D1).

In 1979, a domestic herring fishery for sac roe began on a larger scale in Norton Sound when approximately 1,292 tons of herring were taken by 63 fishers (13 purse seiners, 50 gillnetters). Purse seiners took 70% of the total catch.

After the 1979 season, Alaska Board of Fisheries adopted a public proposal which made gillnets and beach seines the only legal commercial herring fishing gear within Norton Sound. A purse seine fishery could only be opened if the gillnet fleet could not take the allowable harvest. This regulation was an attempt to encourage involvement of local fishers in this developing fishery. During the 1980 season, 294 gillnet fishers harvested 2,452 tons of herring (Appendix D3 and D4). Because gillnet fishers demonstrated they were capable of taking the available harvest, a regulation passed in 1981 to prohibit any purse seine gear within Norton Sound.

Before the 1984 season, the harvest by beach seine fishers was negligible. During 1984, ten beach seine fishers harvested 327 tons. In 1984, Board of Fisheries set a beach seine gear limit of 100 fathoms and limited the harvest to "not exceed 10 percent of the total herring sac roe harvest projection as published by the department." During the fall 1987 Board of Fisheries meetings, beach seine gear was further restricted to a limit of 75 fathoms. Beach seine harvests since 1985 averaged 6.3% of the total reported harvest, but since 1998 little market interest exists in herring caught with beach seines. The last commercial beach seine harvest of herring was in 2000.

As with any developing fishery, fishing effort increased with each successive season. In 1984 Norton Sound became a Super-Exclusive Use herring fishing district to slow growth and bolster local involvement, but had only limited success. The 1987 season had the highest level of fishing effort on record, a total of 564 fishers made at least one delivery; 559 gillnet and 22 beach seine permits recorded landings (Appendix D3). Some fishers made both beach seine and gillnet deliveries. This effort was more than twice the average from 1980 through 1986. Local Norton Sound area residents accounted for only 36% of the effort and 29% of the total harvest.

A public proposal adopted at the fall 1987 Board of Fisheries changed the Norton Sound Herring Fishing District to Limited Entry status. Beginning with the 1988 season, a moratorium was placed on Norton Sound, no new entrants were allowed into the fishery. The Limited Entry Commission is reviewing and awarding limited entry permits to fishers based on fishing history and will eventually reduce the total number to 301 gillnet and 4 beach seine permits as directed by the Board of Fisheries. Currently, most fishers have already received limited entry permits and others are still fishing with interim-use permits while their eligibility is evaluated case-by-case.

No fishery occurred in 1992 because of a late ice breakup in Norton Sound. Low prices and declining market conditions resulted in a below average harvest in 1994. More recently, the harvest averaged 3,215 tons from 1997 to 2001. Stock status, market conditions and climatic factors influence the level of commercial harvest.

Spawn on Kelp

A small-scale spawn-on-kelp *(Fucus)* fishery existed in Norton Sound from 1977 to 1984. Harvests during the 1977-1984 period ranged from less than one ton (1977) to approximately 47 tons (1981). In addition, during the 1984 season, one ton of *Macrocystis* kelp imported into Norton Sound resulted in a harvest of approximately 3 tons of product. In response to a public proposal, the Board of Fisheries closed all spawn-on-kelp fisheries in Norton Sound before the 1985 season.

The 1998 herring market was known to be poor before the southernmost fisheries opened. Alaska Board of Fisheries approved an experimental herring spawn on *Macrocystis* kelp fishery to operate in Norton Sound during the 1998 season. The Commissioner approved emergency regulations to allow a herring spawn on wild *Fucus* kelp fishery shortly before the normal start of the sac roe fishery. The intent of these decisions was to allow as much opportunity as possible to sac roe permit holders, since only a small minority would have an opportunity to participate in the sac roe fishery.

At their January 1999 meeting, the Board of Fisheries instituted a *Macrocystis* kelp open pound fishery and allowed for a wild *Fucus* spawn on kelp fishery for sac roe permit holders who had not sold sac roe product. Wild *Fucus* harvest is limited to an area west of Wood Point to Canal Point Light, including Stuart Island. The herring spawn-on-kelp guideline harvest level may not be more than 90 tons, to include the combined weight of herring eggs and kelp. The department shall manage the herring pound spawn-on-kelp fishery to achieve this level by restricting the number of blades of kelp that may be suspended from a herring pound: (1) no more than a total of 75,000 blades of kelp are allowed in the fishery; and (2) the maximum number of blades of kelp any permit holder may attach to a herring pound is 3000; if more than 25 permits are issued for this fishery, the department shall determine the number of blades of kelp a permit holder may attach to a herring pound by dividing 75,000 by the number of permits issued.

Management Strategies

The overall statewide management strategy is to annually harvest 0-20% of the herring biomass. The upper end of the exploitation range is applied to stocks in good condition. The lower end of the exploitation range is applied to stocks exhibiting a trend of decreasing abundance and poor recruitment. If a minimum threshold level is not achieved, 7,000 tons for Norton Sound, no commercial fishery will be allowed.

Typically herring are long lived fish and will usually remain harvestable for at least five years after recruiting into the fishery. Harvesting only a percentage of the biomass ensures some fish will remain for following years. This type of strategy helps mitigate population fluctuations caused by successive years of poor recruitment, a common occurrence in marine spawning fish. Before 1983, harvests in Norton Sound were regulated on a

subdistrict basis so harvests would be dispersed over the entire fishing grounds. This strategy prevented harvest efforts from concentrating in one area, on what was then thought to be a distinct stock of fish.

Since methods to reliably forecast herring returns are still being developed and estimates of recruitment are not available, inseason assessments of biomass supersede the projected biomass for management of the Norton Sound herring fishery. The herring biomass is managed for a 20% exploitation rate at biomass levels twice the minimum threshold or greater. If the run does not materialize as projected, the harvest exploitation rate may be reduced to a lower level.

Generally, fisheries management staff has tried to set commercial openings to allow gillnetters to fish flood tides as they crest. The belief that ripe females approach the beach at that time to spawn, figures heavily in this strategy. Because the Norton Sound fishery covers a large area with varying tides, opening at the optimal time throughout the district is not always possible. The fishing fleet must be flexible to maximize catches and roe quality.

In the past, the duration of beach seine openings is dependent on herring abundance near the beach and favorable weather conditions for spotters and fishing. Beach seiners prefer to work flood tides similar to gillnetters, however, fisheries managers frequently provide less optimal fishing times. The beach seiners are able to harvest their allotment of 10% of the preseason harvest goal in a single three-hour opening under ideal conditions. By the nature of the gear, beach seiners have the potential to wrap up large numbers of fish that could potentially exceed their allocation. Management staff have often reduced the beach seine efficiency by allowing a gillnet opening to occur before the beach seine opening. This order breaks up school size and reduces the likelihood of excessive harvests. Occasionally, the beach seine fleet has been used to test the roe quality of herring newly arrived in nearshore waters before a gillnet opening. The potential for waste would have been great had the entire gillnet fleet fished on poor quality herring.

The present market desires a high roe percent and larger size fish. These criteria have been difficult to achieve with beach seine gear and in recent years little buyer interest exists for herring harvested from beach seines.

2002 SEASON SUMMARY

A poor herring market was expected even before the southernmost herring fisheries opened.

Spawn on Kelp

Permit holders wishing to participate in the *Macrocystis* spawn-on-kelp open pound fishery were required to register with the Nome Fish and Game office by April 16. Five permit holders registered as participants in the *Macrocystis* fishery. No fishers deployed kelp during the 2002 season because of the early run timing and no reliable market.

Sac Roe

The herring fishery opened by emergency order on May 22; two companies were registered to buy. The total harvest of sac roe herring based on fish ticket data was 1059.0 tons of herring and had an average roe recovery of 10.6% (Table 13). An additional 63.8 tons of herring was purchased as bait. This year had the second lowest harvest in the history of the fishery. In Subdistrict 1, a total of 339.8 tons of herring was harvested at 10.1% average roe recovery. In Subdistrict 3, a total of 719.2 tons were harvested at 10.8% average roe recovery. Buyers reported harvest with a 10% reduction because of water content. Consequently, staff converted the reported harvest back to wet weights, which has been the standard of reporting weight in Norton Sound for comparison purposes. Forty-six gillnet fishermen made at least one delivery during the season, ranked as the lowest effort in the history of the Norton Sound sac roe fishery. No beach seine permit holders were present in Norton Sound in 2002 because of no buyer.

Two companies were present on the grounds during the 2002 season, and 2 processors and 7 tenders were registered (Appendix G3). Based on final operations reports, the average price estimated for a short ton of 10% roe herring was $155. The total value of the herring harvest to the sac roe fishermen was approximately $160,088 based on the reported poundage with a 10% reduction caused by water content. This averages to $3,480 for each fisherman making a landing. The 2002 season has the lowest value for the Norton Sound herring fishery (Table 13).

Fishery Management/Emergency Orders

The department projections for the 2002 spawning biomass, for the Norton Sound sac roe fishery was 22,463 tons. At 20% exploitation rate. the guideline harvest level for the Norton Sound District was 4,493 tons with 4,173 tons allocated to the gillnet fishery. The first tenders arrived at Norton Sound on May 20. Most of Norton Sound was ice free, but shore fast and broken ice was still present along the eastern edge of Cape Denbigh, Norton Bay, St. Michael Bay and the western edge of Stuart Island. Some shore fast ice remained along the Elim shore. Herring were first observed in Norton Sound on May 20 when the first aerial survey of the season documented 8,969 tons. Most of the herring was near Stuart Island. Spawn was observed all along Stuart Island and at Klikitarik. The

department put the herring fleet on notice that as soon as processors were registered and on the grounds, and herring was of marketable quality, commercial fishing could commence. The first herring were captured in department test nets on May 21 in the Tolstoi Point area.

Two companies registered to buy herring in Norton Sound on May 21. An aerial survey flown May 21 observed 15,000 tons of herring, most in Subdistricts 1 and 3. Significant spawn was observed around Klikitarik and Stuart Island. An aerial survey on May 22 documented a similar estimate of herring and spawn. Because of expected low participation by fishers and limited buying capacity, the department wanted to take advantage of the good quality fish as soon as available. The first commercial fishing period was opened May 22 at 11:00 p.m. for 13 hours. Gear was limited to one 50 fathom net. Buyers could then control test fishing and fishers could immediately harvest good quality herring. The opening was extended for 12 hours until 12:00 midnight May 23. The department allowed another 24 hour fishery opening for gillnetters beginning at 12:00 a.m. May 24. The department stayed with daily, 24 hour openings throughout the season. Buyers were able to direct fishing efforts to areas with good roe percentages to take advantage of marketable herring right away.

On May 26, the department allowed fishers to use a total of 100 fathoms of gillnets. Approximately 20 boats participated in the commercial fishery, and with catches beginning to decrease, buyers requested fishers be allowed to use two nets. The use of two nets allowed the fishers to maximize their harvest.

One company ceased buying operations on May 31. The second company purchased sac roe herring until June 3. Commercial gillnetting was opened by emergency order in Subdistrict 7 (Nome area) from 12:00 noon, June 4 until 12:00 noon, June 12. Nome area fishers requested an opportunity to harvest herring for bait near Nome. The Norton Sound sac roe commercial harvest did not reach the harvest guideline and had no conservation concern. This fishing period was allowed to harvest herring while at their peak abundance for local fishers. However, no herring were reported harvested during this opening.

A total of 12 commercial gillnet periods in the Norton Sound District between May 22 and June 3 for a total of 288 hours of fishing time. The single period in Subdistrict 7 was a total of 192 hours in duration. Fifteen emergency orders were issued (Appendix G7).

Catch Reporting and Enforcement

Herring buyers registered for the 2002 season communicated well with the department during the fishery. Commercial test fishing results were relayed in a timely manner, which provided managers with adequate time to formulate plans and make announcements. Buyers also had a much greater role in deciding where and when to fish because of the limited market. Buyers were required to report herring purchases daily (8:30 a.m.) to the Unalakleet office for the previous 24 hour period. Compliance with requested catch reports was good. Nearly all fishing vessels in the fleet have VHF radios, but their activities are often beyond normal ranges. Managers made fishery updates and emergency order

announcements over both VHF and SSB radios simultaneously to ensure everyone got the same message. Communications with the field camps were accomplished with marine VHF, SSB or by aircraft radio from the aerial survey plane.

One permanent, full time Fish and Wildlife Protection officer was on the Norton Sound herring grounds patrolling through the first half of the 2002 fishery. Protection efforts consisted of a single engine aircraft and a small boat on loan from the department. Four citations were issued. Three were related to commercial fishing without a crewmembers license. One citation was given for littering. Approximately 19 warnings were given for various violations such as ADF&G triangle not attached to vessel, no crew license in possession, and gear not properly marked.

Abundance and Research

Three Department field crews operated during the 2002 season. One crew operated from Cape Denbigh. The second crew operated from a camp at Klikitarik, and a third was based in Unalakleet. The test fish crews' presence and sampling efforts on the herring grounds are critical to the proper management of the fishery and biological documentation of the stocks.

Unalakleet field office personnel during the season consisted of the area management biologist, two assistant area biologists, and two seasonal fishery biologists. Norton Sound Economic Development Corporation supplied one fishery intern to assist ADF&G in test fishing and sampling during the herring fishery.

Biomass Determination

The peak aerial survey took place on June 3 and 4 when approximately 25,945.3 tons of herring were observed, most in spawned-out configurations (Table 12), and was above the projected 22,463 tons. Weather was good to fair for most of the aerial surveys. The primary spawning was thought to have taken place between May 21 and 24. A total of 67.9 miles of spawn were observed throughout the fishery.

2003 Outlook

By adjusting for growth and survival, it is estimated that the biomass will be 25,312 tons, allowing a harvest of 5,062 tons at a 20% exploitation rate. A maximum of 320 tons of herring are to be reserved to allow for the harvest of not more than 90 tons of spawn on kelp. This leaves 4,742 tons for the sac roe harvest (4,268 tons by gillnets, 474 tons by beach seines) and any subsequent bait fisheries. The beach seine harvest will not exceed 474 tons that equates to 10% of the allowable sac roe harvest. Ages 6, 7, and 10 are expected to dominate the returning biomass (37.2%, 27.5% and 7.8% respectively). Age 9 and older herring are expected to contribute over 26.2% of the return (Table 13).

PORT CLARENCE / KOTZEBUE DISTRICTS

Introduction

In the Port Clarence and Kotzebue Districts, regulations state herring may be taken from April 15 through November 15, except that herring may not be taken during the open commercial salmon fishing season. However, before the 1987 season, no spring sac roe commercial fisheries had ever occurred within these districts. Interest in exploring these stocks has been expressed in past years by industry personnel operating in the Norton Sound District. However, no large-scale effort to develop the fishery has occurred because of the late ice breakup and fishery timing in the Port Clarence and Kotzebue Districts.

The Port Clarence and Kotzebue commercial herring fisheries have been in regulation since 1982. The 1983 and 1984 regulation books set a guideline harvest of 150 mt (165 tons) for each district. Since the guideline harvest has never been changed or repealed by the Board of Fisheries, the 165 tons guideline harvest is still in effect. Presently purse seines, beach seines, and gillnets are legal commercial gear within these districts, and regulation allows spawn-on-kelp fisheries. Attempts at open pound *Macrocysitis* harvest in the Port Clarence District in 1991 and 1992 were unsuccessful.

Local fishers from Teller, Shishmaref, and Kotzebue have also expressed increasing interest in exploiting these stocks. While small harvests of herring for food/bait have occurred during the fall, fisheries in these districts were limited by lack of markets.

Resource Investigations

Resource investigations of Port Clarence and Kotzebue Sound area herring stocks were conducted by ADF&G from March 1976-September 1978 (Barton 1978). These studies indicated herring populations from Golovnin Bay (Norton Sound) northward differed significantly in size and behavioral characteristics from herring populations occurring in the southern Bering Sea. Differences between populations were summarized as follows (Barton, 1978).

Seward Peninsula Populations	Southern Norton Sound to Southern Bering Sea Pelagic Populations
Smaller herring at age with lower vertebral counts.	Larger herring with probable higher vertebral counts.
Lower abundance.	Higher abundance.

Subtidal spawning (3m) in shallow bays, inlets and lagoons.	Intertidal and shallow subtidal spawning along exposed rocky headlands.
Zosteria sp. primary spawning substrate.	*Fucus* sp. primary spawning substrate.
More euryhaline.	Less euryhaline.
Overwinter in shallow bays; water is warmed by river discharge under ice cover.	Overwinter in deep ocean layers near the Pribilof Islands.
Fall (non-spawning) runs documented.	No fall runs documented.
Larval development in brackish water.	Larval development probable in more saline water.

Data collected from herring populations along the Seward Peninsula strongly indicated that a separate stock of herring occurs in the Port Clarence and Kotzebue Sound areas. This data does not preclude the possibility of the occurrence of more southern stocks from utilizing this region, such as stocks which winter near the Pribilof Islands and migrate to the western Alaska coast to spawn. Migration to the central Bering Sea for wintering herring stocks along the western Seward Peninsula is unlikely, rather they might remain in coastal lagoons, bays or inlets which are warmed by river discharge under the ice (Barton 1978). Size difference may be explained by warmer water temperatures from the river discharge. Water temperatures and feeding conditions in deep ocean waters are probably more favorable for growth than those in herring winter habitats along the Seward Peninsula, which apparently have become adapted to Arctic conditions (Barton 1978).

Aerial surveys are difficult in the Port Clarence District because of organic coloring of the waters of Imuruk Basin, Tuksuk Channel, Grantley Harbor and to a lessor extent, Port Clarence. Aerial surveys were impractical in Imuruk Basin and Tuksuk Channel. The presence of other species of fish caught in test commercial gear sets indicate the need for verifying any biomass sighted. A further complicating factor within Port Clarence is the spring ice conditions. Port Clarence is a very sheltered body of water which becomes highly stained over winter and takes time to clear once the ice melts. Typically, outside waters are significantly warmer than the inside waters which are covered by ice longer thereby slowing solar gain and water mixing. Soon after the ice begins to shift the herring move into the warm shallow lagoons to spawn. The herring are invisible to aerial observation once they enter the stained water. The best aerial survey conditions exist just outside the entrance to the Port, where herring mass just before the ice moves. One or two surveys were flown each of the past several years, but virtually no herring were observed because the narrow window of time for seeing fish was missed.

Spring/Fall Food/Bait Fishery

Although a fall fishery has probably existed for subsistence use within these areas for many years, a commercial venture has only been attempted recently. The primary use of those fish are for crab bait and dog food. People typically fish occurs during September and the ice free portion of October. A fish buyer located at Nome in 1994 and 1995 who provided a ready crab bait market and transportation for the fish had facilitated a spring harvest. However, no one has fished for bait since 1996 (Appendix D6).

Sac Roe Fishery

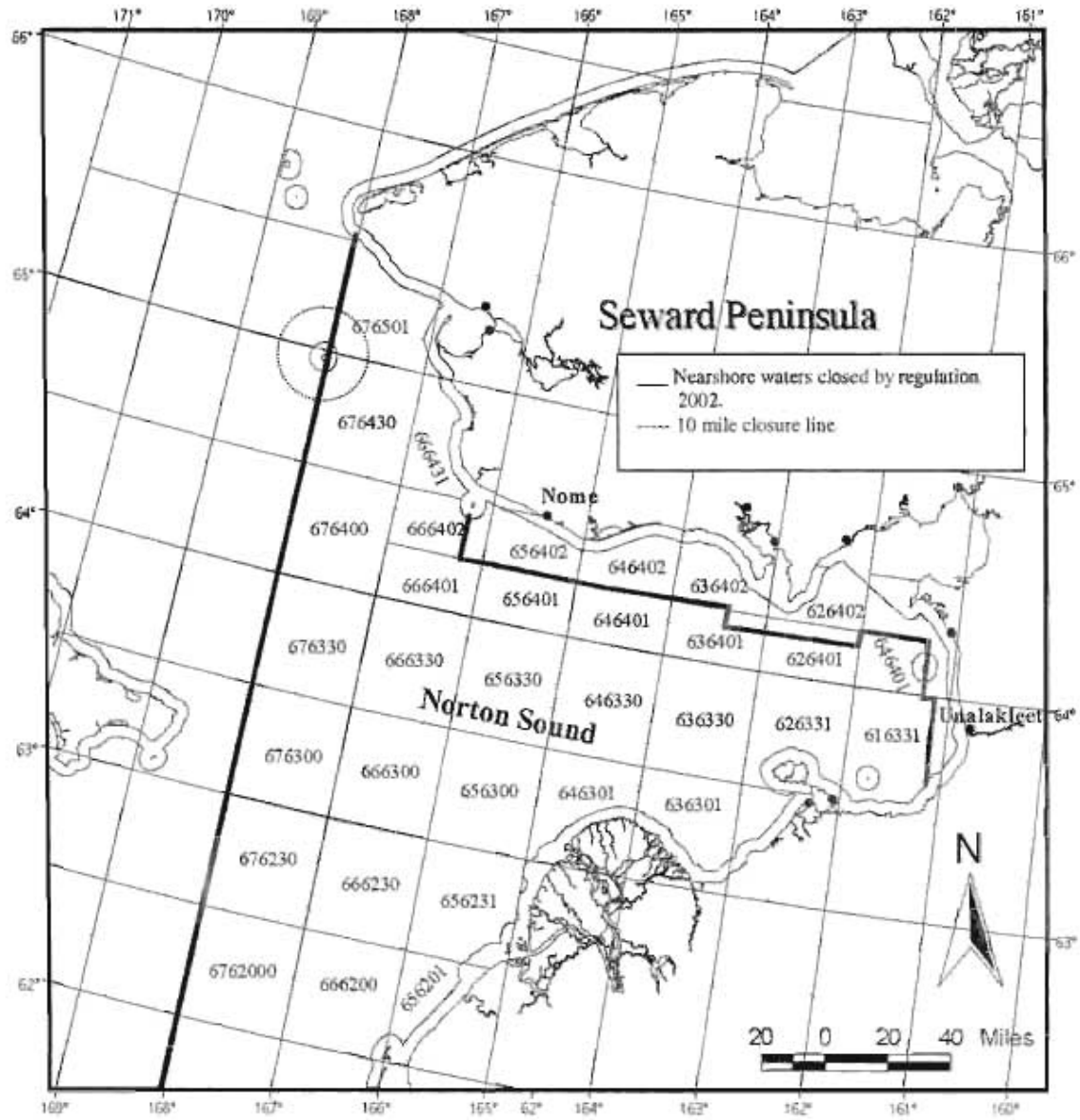
Port Clarence fishers were unable to attract a sac roe buyer for their relatively late fishery. During 1991 and 1992, one individual imported *macrocystus* kelp and attempted an open pound. No herring spawned on the imported kelp, although ripe herring were found in close proximity and very light spawn was found on blades of *Zosteria sp.* nearby.

SECTION 3: KING CRAB
(Includes Norton Sound,
Port Clarence and Kotzebue Districts)

INTRODUCTION

Norton Sound

Norton Sound Section (Q3) consists of all waters in Statistical Area Q north of the latitude of Cape Romanzof, east of 168° west longitude, and south of the latitude of Cape Prince of Wales (Map 6, Figure 11).



Map 6. Statistical areas for the Norton Sound red king crab fishery.

A large vessel summer commercial crab fishery existed in the Norton Sound Section from 1977 through 1992. No summer commercial fishery occurred in 1991 because staff needed to manage the fishery the previous winter. In 1992, the summer commercial

fishery resumed. Appendix E1 shows the historical summer commercial harvest by year for the Norton Sound crab fishery. Regulation changes adopted during the March 1993 Board of Fisheries meeting changed participation in the fishery to that of small boats. A superexclusive designation went into effect for the Norton Sound commercial crab fishery June 27, 1994. This designation stated a vessel registered for the Norton Sound crab fishery may not be used to take king crab in any other registration area during that registration year. Later a vessel moratorium put into place before the 1996 season had the intention of creating a license limitation program. The Community Development Quota (CDQ) groups were allocated a portion of the summer harvest beginning in 1998. Although the CDQ allocation was in place, no harvest occurred until the 2000 season. The North Pacific License Limitation Program (LLP) went into effect for the Norton Sound crab fishery January 1, 2000. The program states a vessel which exceeds 32 feet in length overall must hold a valid crab license issued under the LLP by the National Marine Fisheries Service.

The Norton Sound red king crab length based population model developed by Zheng, et al. (1998) incorporates trawl surveys, winter and summer pot studies, and summer and winter fisheries data from 1976 to present. The model can then be used to project estimates in years when no trawl survey occurs, allowing abundance-based management of the Norton Sound red king crab fisheries.

During the March 1999 meeting of the Board of Fisheries, a new management strategy was enacted for the Norton Sound summer red king crab fishery (5AAC 34.915). A threshold level of abundance of legal male red king crab biomass was set at 1.5 million pounds. The summer commercial season may only open if the population of legal crab exceeds 1.5 million pounds. If the legal biomass falls to a range of 1.5 to 2.5 million pounds the harvest rate will not exceed five percent, so that the stock may rebuild. If the legal biomass is 2.5 million pounds or more, the harvest rate will be no more than ten percent. Improved abundance estimates and the current management strategy will greatly reduce the risks of over fishing the stock.

New regulations adapted by the Board of Fisheries during the March 2002 meeting affected the CDQ crab fishery and relaxed closed water boundaries in eastern Norton Sound and waters west of Sledge Island. Changes in the closed water boundaries are illustrated in Map 6 and Figure 11. The Norton Sound CDQ fishery may begin at 12:00 noon, June 15, or no less than 72 hours after the commercial gillnet or beach seine herring fishery is closed, whichever is later, through 12:00 noon, June 28. After July 1, the commissioner may, by emergency order, open a CDQ fishery for any remaining allocation after the closure of the open access fishery.

Estimates of the legal red king crab biomass in Norton Sound, based on nine trawl surveys conducted between 1976 and 2002, have been standardized; accounting for design and coverage (Appendix Table E5). The Norton Sound legal red king crab biomass in 1976 was estimated to be roughly 1.7 million crab. By 1982, the legal biomass had fallen to 0.8 million crab because of a lack of recruitment and high harvest rates in the summer commercial fishery. The population then gradually recovered to an estimated 1.2 million

legal crab in 1991. The trawl survey conducted during August of 1996 indicated a reduced stock size and estimated the legal biomass at 0.5 million crab. In 1999, the legal red king crab population of 1.5 million crab was estimated by a trawl survey to be near the historical high biomass. The population level had nearly tripled since 1996. An all-time high prerecruit-1 male abundance (sublegal male crab with carapace length 90-104 mm) was also detected. Conversely, the exceptionally weak 1999 prerecruit-2 (sublegal male crab with carapace length 76-89 mm) abundance estimate suggested at least one year of weaker recruitment beginning during the 2001 summer fishery. The surveys taken as a whole indicate there have been periods of weak and strong recruitment.

In 1999, the legal red king crab population of 1.5 million crab was estimated by a trawl survey to be near the historical high biomass (Appendix E5). The population level had nearly tripled since 1996. An all-time high prerecruit-1 male abundance (sublegal male crab with carapace length 90-104 mm) was also detected (Figure 13). This estimate indicated that the legal component would continue to expand at least for the 2000 fishery. Conversely, the exceptionally weak 1999 prerecruit-2 (sublegal male crab with carapace length 76-89 mm) abundance estimate suggested at least one year of weaker recruitment beginning during the 2001 summer fishery. The combination of the trawl survey conducted during the summer of 1999 and the winter king crab study of 2000 resulted in an estimate of 4.2 million pounds of legal crab for the 2000 summer fishery. These high numbers were the result of strong recruitment over the previous three years. The estimated legal male crab abundance for the 2001 summer commercial crab fishery was estimated at 3.8 million pounds. An eight percent exploitation rate equated to a guideline harvest level (GHL) of 303,000 pounds of crab. This satisfied the harvest strategy set by the Board of Fisheries and also took into consideration the lower recruitment rate anticipated for the 2001 season. The estimated legal male crab abundance for the 2002 summer commercial crab fishery is 3.1 million pounds. This is down from the 2001 legal abundance. The size composition data from the 2002 winter pot study indicated that the portion of the crab population classified as postrecruit males was depressed. An 8 percent exploitation rate equates to a guideline harvest level of 248,000 pounds of crab. The CDQ allocation was 18,600 pounds of crab. This satisfied the harvest strategy set by the Board of Fish and take into consideration the lower legal population for the 2002 season. The winter pot study also pointed to a large prerecruit-1 and prerecruit-2 population. These crab will molt and become part of the legal population in the next two years.

In August 2002, the department conducted the triennial Norton Sound king crab trawl survey. The estimated abundance of legal male red king crabs was 771,569 with a corresponding biomass of approximately 2.3 million pounds. This was less than half of the 1999 abundance estimate, yet above the all time low in 1996. This decrease was expected, as the 1999 trawl survey indicated an exceptionally weak prerecruit-2 abundance. The prerecruit-2 crabs observed in 1999 now make up the recruit and postrecruit portion of the legal population. The Norton Sound summer commercial crab harvest has shown an almost 10 percent decrease in recruitment since the 1999 season.

Estimated abundances for pre-1 and pre-2 males were 518,638 and 427,703 crabs, respectively. The 2002 pre-1 male abundance estimate was lower than the all-time high

observed in 1999, but higher than the three prior surveys. These crabs will molt and give a much-needed boost to the recruit portion of the legal crab biomass in 2003. Prerecruit–2 male crab abundance was over four times greater than 1999 and the fourth highest abundance estimate since 1976 indicating increased recruitment for the 2004 and 2005 seasons. These recruitment events should push the legal population to higher levels than we presently observe.

St. Lawrence Island

The St. Lawrence Island Section (Q4) lies immediately west and north of the Norton Sound Section. Commercial catches in the St. Lawrence Island Section have only been reported for four years. In 1983, 52,557 pounds of blue king crab delivered from 13 landings. The commercial crab fleet concentrated their efforts near the southeast shore of St. Lawrence Island. In 1984, a regulation was adopted to close the waters within ten miles of all inhabited islands within the St. Lawrence Island Section (St. Lawrence Island, Little Diomede and King Island). This regulation attempts to protect stocks targeted by local fishers and reduce impacts on marine mammal subsistence harvests. In 1989, 3,603 pounds of red king crab and 984 pounds of blue king crab were delivered from eight landings. In 1992, 53 pounds of blue king crab were landed. In 1995 7,913 pounds of blue king crab were delivered from three landings.

The villagers of Little Diomede and St. Lawrence Island have bartered with and sold winter caught blue king crab to residents of Nome and other villages for years. The Department does not have an accurate estimate of the magnitude of this trade. The remoteness of the villages contributes to the lack of catch records. Current regulations allow a commercial harvest and sale of king crab nearshore during the winter. However, local residents have decided not to export any of their winter catch for commercial sale.

Norton Sound Summer Open Access Commercial Fishery

The 2002 summer open access commercial crab fishery was opened by regulation at 12:00 noon, July 1 in the Norton Sound section. The guideline harvest level was 229,400 pounds of crab. Two companies were registered to buy crab in Norton Sound during the 2001 season. One of these buyers operated a new seafood processing plant in Nome and purchased crab from local Norton Sound fishers. Nonlocal fishers delivered to the second buyer who flew live crab to markets in Anchorage. Some fishers also sold their catch dockside as catcher/sellers. The open access portion of the fishery was closed by emergency order at 12:00 noon, August 6, 2002 when the harvest was expected to approach the goal of 229,000 pounds.

The total harvest from fish ticket reports was 81,502 red king crab or 244,376 lbs (Table 14). Of this total, 2,359 pounds were reported as deadloss. A total of 28 vessels made deliveries and 32 permit holders fished. Twenty-one of the vessels were considered local and seven were non-local. A total of 164 landings were made. Local boats accounted for 74 percent of the total crab harvest. The average weight for commercially caught crab was 3.0 pounds. A total of 1,120 pots were registered and 5,958 pots were pulled throughout the fishery. The average price paid was $2.81 per pound. The exvessel value of the fishery is estimated at $686,696.

Fish ticket reports document that 11 statistical areas were fished. Stat areas 656401 and 626401 had the highest catch with 63,038 and 53,722 pounds of crab respectively. The other large catches came from stat areas 636401 (50,906 pounds), 666401 (35,970 pounds) and 666402 (30,070 pounds). The catch from stat areas east of 164° made up 42.6 percent of the harvest (Figure 11). All other stat areas comprised 57.4 percent of the harvest. Overall, catch per unit effort (CPUE) was 13.7 crab per pot (Table 14), almost double the 2001 CPUE of 7.6 crab per pot.

The first delivery in the open acces fishery was made on July 3 and the final delivery was made August 9, 2002. Although the open access fishery ended 12 noon, August 6, some fishers had been holding storage pots off shore and had 72 hours to make deliveries. The 2002 open access fishing season was the shortest since 1994. The commercial crab fleet concentrated in two areas of operations throughout most of the open access fishery. A portion of the fleet delivered to a small tender vessel in Golovnin Bay. These crab were delivered to Nome for processing. The other portion of the fleet based their operations out of the Port of Nome. These fishers sold crab to the seafood processing plant or to a processor flying live crab to markets in Anchorage. The CPUE improved near the end of the fishery, to exceed the guideline harvest by almost 15,000 pounds.

CDQ Fishery

The Norton Sound and Lower Yukon CDQ groups divided the CDQ allocation. Only fishers designated by the Norton Sound and Lower Yukon CDQ groups are allowed to participate in this portion of the king crab fishery. Fishers were required to have a CDQ fishing permit from Commercial Fisheries Entry Commission (CFEC) and register their vessel with ADF&G before they made their first delivery. Fishers operated under the authority of the CDQ group and the individual CDQ groups decided how the CDQ crab quota was harvested.

The CDQ fishery began at 12:00 noon June 15, 2002 and closed at 12:00 noon June 28, 2002. The harvest was 10,551 pounds of crab, well below the CDQ allocation. Therefore the CDQ fishery was allowed to open again on August 9 once the open access fishery was complete. The CDQ harvest was adjusted to 19,805 pounds of crab because the open access fishery exceeded their harvest allocation. Fishing closed by regulation on September 3, 2002. A total of 15,226 pounds (5,164 crab) were harvested during the CDQ fishery openings (Table 15). Eighteen vessels participated and 37 landings were made. A total of 533 pots were pulled. The average price paid to fishers for their harvest was $2.67 per pound. The exvessel value was $40,653 for the CDQ fishery.

Although the CDQ fishery has been in place since 1998, this year was only the second a CDQ harvest occurred. This year was the first the CDQ fishery was allowed to take place before the open access fishery and closer to shore in eastern Norton Sound. One reason why the entire allocation was not harvested was the Yukon Delta Fisheries Development Association CDQ group used the second half of the fishery to prospect for crab offshore of the Yukon River. Fishers wanted to find areas that may have large concentrations of crab, and fish closer to their home base of Emmonak in the future. No crab were reported harvested from that area.

Commercial Catch Sampling

Carapace length measurements and shell age were collected from 5,220 commercially caught crab during the open access and CDQ fishery. Carapace age was classified as new (2-12 months old) or old (over 13 months old) (Appendix E7). Recruit crab are new shell legal crab with carapace length < 116 mm. Postrecruit crab are legal new shell male crab with carapace length ≥ 116 mm and all legal old shell males. Recruit crab made up 33 percent of the legal crab sampled and postrecruit crab made up 67 percent (Appendix E2). The Norton Sound summer commercial crab harvest has shown an almost 10 percent decrease in recruitment since 1999. This decrease was expected, as the 1999 trawl survey pointed to an all-time high prerecruit-1 male crab population, and indicated an exceptionally weak prerecruit-2 abundance (Appendix E6). Male crab with new shell carapaces made up 89 percent of the total legal crab sampled, and old shell crab made up 11 percent (Appendix E7). Overall mean carapace length of legal male crab was 119.5 mm. The average legal mean length of male crab during the 2002 and 2001 fishery increased by over 3 mm since the 2000 fishery. The larger populations of recruit crab observed in

1999 and 2000 have molted multiple times and become the larger postrecruit crab portion of the population.

The Norton Sound red king crab fishery has had the benefit of an onboard observer during the 2000 and 2001 seasons because a floating processor was on the fishing grounds in those years. In years when no observer is onboard, a smaller percentage of crab from the commercial harvest get sampled because fishers deliver at all times of the day and night. The new seafood processing plant that began operating in Nome this summer greatly improved the ability of Nome ADF&G staff to sample the crab brought to the Nome dock. A floating processor would unlikely operate in the Norton Sound fishery in the future. The department will continue to make a concerted effort to coordinate catch sampling with fishers and buyers to ensure optimal commercial harvest data collection.

Enforcement

The Nome Fish and Wildlife Protection officer was unable to patrol the fishery. One fisher was sited for leaving pots on the grounds after the closure.

Norton Sound Winter Commercial Fishery

A winter commercial fishery in the Norton Sound Section occurs from November 15 through May 15 and typically takes place near Nome. Vessels are prohibited and the winter commercial fishery takes place from the ice. Stability of the sea ice affects the success of the winter fishery. Appendix Table E4 illustrates the winter commercial and subsistence harvest of crab from 1978 to 2002. During the winter of 2001-2002, 11 commercial fishers reported selling a total of 2,591 red king crab. Sea ice conditions were good for most of the season.

The harvest is divided between local residents who buy crab directly from the fishers, the new seafood plant in Nome and other non-local markets such as Anchorage. The average price paid for crab was $3.69 per pound. The 2002 winter catch of crab was estimated to be worth about $24,215.80. Most fishers consider commercial crabbing a sideline and hold other jobs. Usually, two or three of the winter crab fishers sell most of their crab.

SUBSISTENCE FISHERY

Norton Sound residents utilize red king crab for subsistence mainly during the winter. Fishing occurs through cracks or holes cut in the ice with the use of handlines and pots. To document trends in the subsistence harvest, the Board of Fisheries enacted a regulation in 1977 requiring subsistence fishers in Norton Sound to obtain a permit before fishing. Fishers record their daily effort and catch on these permits. During the 2002 season, 114 permits

were issued in the Nome area, and 67 permit holders fished. A total of 3,669 crab recorded were kept for subsistence use in the Nome area (Table 17).

The first year subsistence permits were required had the highest number of permits issued and a relatively high harvest rate. The fishery declined sharply the following year and remained at low levels throughout the 1981-82 season. The lack of success in the winter crab fishery during some past years has been attributed to a declining crab population caused by the removal of crab in the summer commercial fishery together with low recruitment, low effort caused by poor ice conditions, and changes in the nearshore winter distribution of crab. All these factors probably have some effect on the success of the winter fishery in varying degrees. During the 1978-79 winter fishery, the king crab population was still relatively high. Despite this relatively large population, winter catches were the poorest on record indicating the major factors limiting winter catches were probably poor ice conditions and the distribution of crab. During the winter of 1981-82, poor winter catches could more reasonably be attributed to a declining crab population since the crab population was at a lower level. Subsistence fishing success during the winters of 1982-83 through 1986-87 had improved because of a rebuilding of the population and increased use of more efficient gear (pots instead of handlines). Unstable ice conditions and record snowfalls adversely affected the 1987-88, 1988-89, 1992-93 and 2000-2001 catches. During years of stable ice conditions, approximately 100 fishers averaged 100 crabs each.

FUTURE INVESTIGATIONS

A winter pot survey is planned during February, March and April of 2003. The results of the winter project will be used in the length-based model to project the summer 2003 legal biomass and appropriate GHL.

SECTION 4: MISCELLANEOUS SPECIES
(Includes Norton Sound, Port Clarence and Kotzebue Districts)

INTRODUCTION

Several species other than salmon, crab and herring are utilized for commercial and subsistence purposes in the Norton Sound, Port Clarence and Kotzebue Districts. Primary species include inconnu or "sheefish" *(Stenodus leucichthys)*, whitefish *(Coregonus laurettae, Coregonus pidschian, Coregonus sardinella, Coregonus nasus, and Prosopium cylindraceum), (Coregonus sp., Prosopium sp.)*, Dolly Varden *(Salvelinus malma)*, and saffron cod *(Eleginus gracilis)*.

These fish are taken by set gillnets, beach seines, "jigging" through the ice, and rod and reel. Subsistence catches taken during the summer months are normally air dried, and winter catches are stored frozen. Fish are utilized for human consumption and for dog feed. Fish taken for commercial purposes are mainly sold locally, although some are shipped from the area.

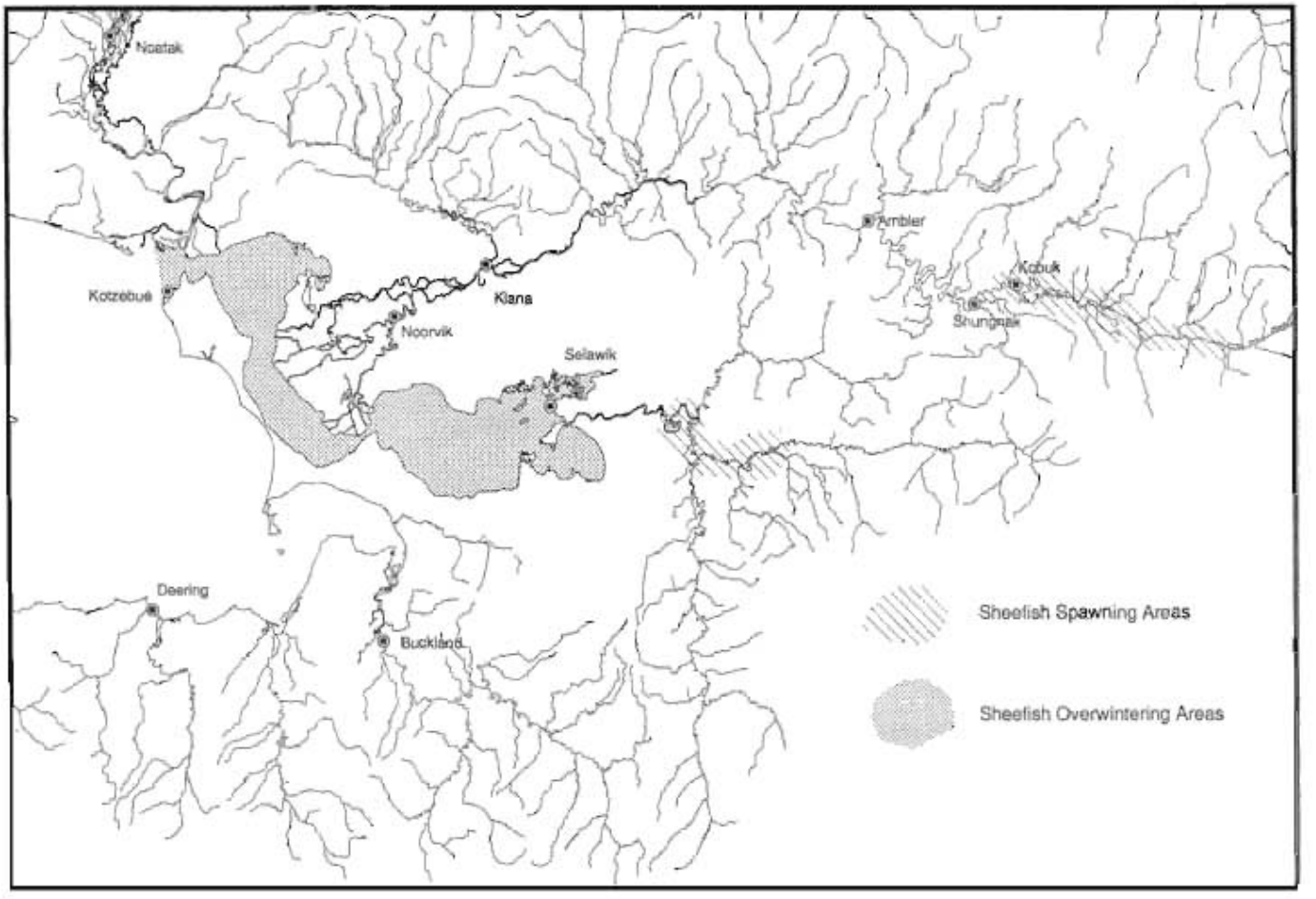
Subsistence harvest of most species is not limited by regulation. Commercial harvest may be prohibited in some freshwater areas, but limited commercial endeavors are allowed in many areas under terms of a permit.

INCONNU (Sheefish)

Introduction

The distribution of inconnu includes the Kobuk-Selawik River drainages, and Hotham Inlet of Kotzebue Sound and some Norton Sound drainages, but the largest populations and harvests occur within the former area (Map 7, Figure 14). In the Kotzebue Sound area, adult fish migrate to upriver spawning areas after ice breakup and to wintering areas within the Hotham Inlet/Selawik Lake area during October-November. Although inconnu are capable of consecutive spawning, most fish spawn every two to three years. Inconnu mature slowly, males reach maturity at 5-7 years of age and females at 7-11 years.

The inconnu's spawning and overwintering migration behavior makes them available for harvest by the various fisheries throughout their life cycle, and increases their vulnerability to overharvest. In addition, the inconnu's slow maturation rate increases the time required to restore depleted populations.



Map 7. Kotzebue and Kobuk River Valley villages and their spatial relationship with inconnu spawning and overwintering areas.

During the 1960s, age, sex and length data indicated stocks were over harvested by the commercial and subsistence fisheries in the Kotzebue district. Consequently, an annual area commercial harvest quota of 25,000 pounds of inconnu was instituted, although subsistence catches remained unrestricted.

Commercial Fishery

Most of the commercial fishing effort occurs near Kotzebue in Hotham Inlet. Fishers use gillnets ranging from 5 1/2 inch to 7 inch stretched mesh which are set under the ice. Recorded commercial catches have remained relatively small; however, undocumented catches are believed to be significant and therefore, harvest totals should be considered minimum estimates. Restricted markets outside northwestern Alaska greatly limit commercial activity and most individuals who normally participate in the winter commercial fishery also fish for subsistence purposes. Incidentally caught inconnu are sold by commercial salmon fishers in years there is a market, but only in small amounts.

Reported harvest and effort in the commercial fishery has declined in recent years. Only 30 Sheefish (300 pounds) was reported harvested commercially in 2002 (Appendix F1).

Subsistence Fishery

In 1987, the Alaska Board of Fisheries adopted a regulation limiting the size of gillnets used to take sheefish for subsistence to not be more than 50 fathoms in aggregate length nor 12 meshes in depth, nor have a mesh size larger than seven inches (5AAC 01.120). This regulation was intended to conserve the larger, breeding portions of the stock. Except for this gear restriction, the state does not restrict timing, area, or quantity of subsistence sheefish harvest. No requirement exists for harvest reporting.

Inconnu have long been utilized for subsistence purposes throughout the Kotzebue basin. Fishers along the Kobuk and Selawik Rivers fish for inconnu during June through October with gillnets, seine nets, and rod and reels. In spring residents of Kotzebue, Noorvik and Selawik harvest sheefish with hand jigs through the ice of Hotham Inlet and Selawik Lake. In early winter, Kotzebue, Noorvik and Selawik fishers use gillnets set under the ice in Hotham Inlet and Selawik Lake.

Appendix F2 estimates sheefish catches reported during the chum salmon subsistence surveys conducted in the fall by Subsistence Division, and for Kobuk River residents may include winter, and as summer and fall catches. In 2002, the Noorvik community harvested an estimated 4,310 sheefish. The mean harvest per Noorvik household was 38 sheefish (Georgette et. al. 2003). Subsistence sheefish harvest information was not collected for Kotzebue where a sizable ice fishery occurs for sheefish in late winter and spring. No information was found concerning sheefish harvests in the Selawik area.

Escapement

Historically, aerial surveys were conducted on key inconnu spawning areas incidental to the effort of enumerating salmon. These surveys were primarily conducted along the upper Kobuk River in September. Survey conditions historically result in either very few or no inconnu being observed (Appendix F3). During these surveys, species identification has been a problem in some years. Surveys were not conducted in 1985 through 1990 because of high, turbid water, poor weather conditions, or lack of personnel. Through the early 1990s incomplete escapement and catch data provide little basis for assessing the current population status of inconnu in the Kotzebue district, however some local residents were concerned that inconnu stocks were declining.

Because of these concerns, a cooperative tagging project on sheefish in the Kotzebue District began in 1994. This study was conducted by Sport Fish Division, U.S. Fish & Wildlife Service (USFWS) and the National Park Service (NPS). Spawning sheefish were tagged in the Upper Kobuk River and the Selawik River. Roughly 600 sheefish were tagged in the Kobuk River by Division of Sport Fish and 150 in the Selawik River by USFWS in 1994. During the fall of 1995, roughly 617 sheefish were tagged in the Upper Selawik

River and approximately 1,386 sheefish in the Upper Kobuk River. In 1996, 2,300 were tagged in the Upper Kobuk and 500 in the Selawik Rivers. The Selawik River project ended in 1996. In 1997, 1,757 sheefish were tagged in the Upper Kobuk River. Spawning population estimates of sheefish in the Upper Kobuk were 32,300 in 1995, 43,700 in 1996 and 26,782 in 1997. Sheefish spawn upstream of the village of Kobuk, the greatest observed concentrations were between the Meneluk and Beaver Rivers. After spawning is complete in late September, fish disperse to downstream overwintering areas. In the Selawik River, the spawning population estimate was 5,200 to 5,300 for both 1995 and 1996 (DeCicco 2001). The tag recoveries showed these stocks mixed in Hotham Inlet winter habitats, but maintained fidelity to their spawning areas (DeCicco 2001).

DOLLY VARDEN

Introduction

Dolly Varden are distributed throughout the Norton Sound, Port Clarence, and Kotzebue Districts. Although taxonomists disagreed on the distinguishing Dolly Varden characteristics and distribution of Arctic Char and Dolly Varden, most now agree char in this area are the northern form of Dolly Varden. To eliminate confusion, in this report these fish are referred to as Dolly Varden, the common name for this species complex.

Dolly Varden in this area are primarily nonconsecutive spawners and spawn throughout the late summer and fall. Fry emerge in the spring and migrate to the ocean during early summer after spending from 1 to 6 (generally 2-5) years in freshwater. Because Dolly Varden are a late-maturing fish (generally age 6-7), they are susceptible to overfishing by commercial, subsistence, and/or sport fisheries. Consequently, commercial fisheries have been maintained at low levels or prohibited to both reduce the potential of overharvest and provide for reproductive and subsistence fishery needs.

Commercial Fishery

Dolly Varden are taken as a non-target species in the directed Kotzebue commercial chum salmon fishery. Regulation changes in 1976, which closed the commercial salmon fishery on August 31, reduced the harvest of Dolly Varden since they typically pass through the harvest area during September. Dolly Varden generally appear in commercial catches during the last three weeks of August. However, in the second period of the 2002 Kotzebue commercial fishery (July 18-22) 30 Dolly Varden were reported as incidental catch. Reported Dolly Varden catches are dependent upon available markets. The typical season catch when buyers are purchasing Dolly Varden is between 1,000 to 3,000 fish (Appendix F4). Spawning and overwintering Dolly Varden (locally called trout) typically begin migrating along the northern shore of Kotzebue Sound during the third week of August.

Subsistence Fishery

Dolly Varden are an important component in the diet of subsistence users in the Norton Sound-Kotzebue Sound areas. Subsistence fishers catch Dolly Varden with seines in the fall, hook and line through the ice in the winter, and gillnets in the spring. The fall seine fishery contributes the greatest number of fish to the annual subsistence Dolly Varden harvest. Since 1962, seine catches made by the residents of Kivalina, within the Kotzebue District, ranged from 7,000 to 49,000 Dolly Varden annually (Appendix F5)

In the Kotzebue District, fall seine fishing is a group effort with several households comprising a fishing group. The catch is stored and allowed to freeze in willow cribs located near the seining site. These fish are used throughout the winter by the fishing group. Notice the historical subsistence Dolly Varden catches because of the survey timings summarized in Appendix Table F5 are minimal figures. Most Dolly Varden harvests take place before or just after freeze-up. The village of Noatak usually fishes before freeze-up, but the Kobuk River villages of Shungnak and Noorvik fish for Dolly Varden throughout the winter. In 2002 an estimated 3,242 Dolly Varden were harvested for subsistence by the community of Noatak for a mean household harvest of about 32 fish (Georgette et al 2003).

Most villagers in the Norton Sound District report incidental catches of Dolly Varden in their subsistence salmon nets. However, the bulk of the catch is taken by seining in the late fall.

Sport Fishery

Residents of the Kotzebue area and nonlocal residents on wilderness boating trips on the Kobuk and Noatak Rivers are the primary participants in the Dolly Varden sport fishery in the Kotzebue area watershed. Approximately 1,500 Dolly Varden are taken in this fishery annually (Sport Fish Division surveys).

Overwintering Counts

Aerial survey counts of overwintering Dolly Varden on the Wulik River have ranged from 297,257 fish in 1969 to 30,923 fish in 1984 (Appendix F6). Weather and water conditions have precluded flying aerial surveys during many years. When weather permits, the Division of Sport Fisheries conducts aerial surveys of the spawning grounds on the Noatak River in the summer and the overwintering areas of the Kivalina and Wulik Rivers in the fall. Surveys flown in the Kotzebue District in 2002 observed 44,257 Dolly Varden in the Wulik River, with spawning counts ranging from 816 in July to 1,500 in August. No surveys were flown on the Kivilina River (Appendix F6).

WHITEFISH

Introduction

Although inconnu belong to the whitefish family, this section deals with several smaller species of the genera *Coregonus* and *Prosopium*. The genus *Coregonus* contains the "broad" and "humpback" whitefish or *C. nasus* and *C. pidschian*, respectively. In addition, three whitefish species known as "ciscoes" belong to this genera; ie., the least *cisco (C. sardinella)*, Arctic cisco *(C. autumnalis)* and Bering cisco *(C. laurettae)*. "Round" whitefish *(Prosopium cylindraceus)* are sole representatives of genus Prosopium in this area. All species normally spawn in fall in fresh water.

Whitefish occur throughout most bodies of fresh water in the Norton Sound, Port Clarence and Kotzebue areas and can also be found in inshore marine waters at various times of the year. Whitefish are harvested to a very limited extent by the commercial and sport fisheries within the area, but are uniformly important to the various subsistence fisheries. Recently, interest in commercial development of this resource is increasing, especially in the Kotzebue District.

Commercial Fishery

Limited commercial whitefish harvests were allowed since statehood, normally under the auspices of a permit that delineated harvest levels, open areas, legal gear, etc. Commercial whitefish fisheries were generally limited to large open water areas (e.g. Grantley Harbor in the Port Clarence District) or ocean waters. Beach seines were stipulated as legal gear in some instances to reduce the number of incidental species taken. Little comparative commercial catch and effort data were recorded, but harvest levels are historically low. Most commercial catches were made in Golovnin Bay in the Norton Sound District, in the Kuzitrin River in the Port Clarence District, and in Hotham Inlet and Selawik River in the Kotzebue District. The fish were sold to local markets for human consumption, dog food, or more recently, crab bait.

Subsistence Fishery

Whitefish harvested for subsistence are taken mainly by beach seine or set gillnets. Catches are usually dried and used for human consumption or dog food. In some areas fish are "gutted" and dried early in the summer, but later in the summer the fish are filleted and dried with the eggs and viscera intact.

Subsistence catch enumeration is difficult since fishers do not count fish individually, but by "tubs", "bags", "strings" or any other estimators of gross abundance. Additionally, many fish are dried and consumed or stored in caches before the survey period. Reported

subsistence harvests were generally the result of a limited and sporadic survey effort and should be regarded as minimum values and not comparable from year to year. In 1997, subsistence harvests of whitefish were included for the first time in Division of Subsistence household salmon harvest surveys in Kotzebue Sound villages. An estimated 25,607 whitefish were harvested in 2002 for subsistence in the Noatak and Noorvik villages (Appendix F7). Mean household harvests ranged from 197 whitefish in Noorvik to 29 whitefish in Noatak (Georgette et al 2003).

Escapement

Whitefish escapements have not been monitored in the past, but limited department observations or fishers interviews do not indicate declining populations.

SAFFRON COD

Saffron cod, or tomcod as they are called locally, are extensively utilized as a subsistence resource in the Norton Sound, Port Clarence and Kotzebue areas. Tomcod are taken through the ice by jigging and with gillnets in open water and under the ice in Unalakleet.

An extensive commercial fishery on tomcod in the Norton Sound, Port Clarence or Kotzebue areas has never occured. During 1980, one fisher caught and sold 89 pounds (98 tomcod) in the Nome Subdistrict. No commercial landings occurred during 1982. In 1983, one Nome area fisher caught and sold 2,548 pounds (4,348 tomcod) and in 1989 one fisher sold 1,800 pounds locally. These fish were used for dog food, crab bait and human consumption. No commercial deliveries were reported during 1984-1993.

In 1994, Norton Sound Economic Development Corporation (N.S.E.D.C.) provided a market for several fish species not commercially utilized in the past. The need for crab bait was the primary factor to initiate the fishery at Unalakleet, where 1,402 pounds were sold in seven deliveries in January and February of 1994. In 1995, the NSEDC market was not present, which was likely a factor in the reduced harvest. The 1995 harvest totaled 52 pounds which sold for $.50 per pound with a total value of $26.00. No commercial harvest was reported from 1996 through 2002.

MISCELLANEOUS FINFISH SPECIES

Other finfish species taken for subsistence in the Norton Sound, Port Clarence, and Kotzebue area: rainbow smelt (boreal smelt), capelin, northern pike, starry flounder, yellow fin sole, arctic flounder, Alaska plaice, grayling, burbot, Pacific herring in the fall time, and halibut (Appendix G1).

Subsistence utilization of these species has been documented although effort and catch vary widely in scale and importance with locality. Some of these species are important to the subsistence community in certain localities during specific seasons of the year.

Rainbow smelt, like saffron cod, had a limited commercial harvest at Unalakleet. During January, February and March of 1994, 631 pounds of rainbow smelt were reported sold in nine deliveries for bait. The smelt and cod harvests from Unalakleet both occur in estuarine areas. The smelt were reported higher in the water column than the cod. Either species could often be harvested from the same jigging site. Burbot, or freshwater cod, have been commercially sold sporadically in the past in the Kotzebue, Port Clarence and Norton Sound Districts under commercial permits.

LITERATURE CITED

Barton, L.H. 1978. Finfish Resource Surveys in Norton Sound and Kotzebue, Alaska Department of Fish and Game, Division of Commercial Fisheries. AYK Region OCS Report. Alaska Marine Environment Assessment Project, Research Unit 19. September, 1978. Anchorage.

Bockstoce, John. 1979. The Archeology of Cape Nome, Alaska. The University Museum, University of Pennsylvania, Philadelphia.

DeCicco, F. 2003. Fishery Management Report for sport fisheries in the Northwest Alaska regulatory areas, 1999-2000. Alaska Department of Fish and Game, Division of Sport Fish, Fishery Management Series No. 01-06, Anchorage.

Georgette, S., D. Caylor and S. Tahbone 2003. Subsistence Salmon Harvest Summary, Northwest Alaska, 2002: Norton Sound District, Port Clarence District, and Kotzebue District. Alaska Department of Fish and Game, Division of Subsistence. Kotzebue.

Magdanz, J.S. and D.E. Punguk. 1981. Nome River Fishery II. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No. 5, Nome.

Ray, D.J. 1975. The Eskimos of Bering Strait, 1650-1898. University of Washington Press, Seattle, WA.

Thomas, D.C. 1982. The role of local fish and wildlife resources in the community of Shaktoolik, Alaska. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No. 13, Nome.

Zheng, J., G.H. Kruse, and L Fair 1998. Using multiple data sets to assess red king crab *Paralithodes camtschaticus* in Norton Sound, Alaska: A length-based stock synthesis approach. Pages 591-612 in Fishery Stock Assessment Models, edited by F. Funk, T.J. Quinn II, J. Heifetz, J.N. Ianelli, J.E. Powers, J.F. Schweigert, P.J. Sullivan, and C.-I. Zhang, Alaska Sea Grant College Program Report No. AK-SG-98-01, University of Alaska Fairbanks.

Table 1. Norton Sound commercial salmon harvest summary by subdistrict, 2002.

		Subdistricts						
		1	2	3	4	5	6	Total
Number of Permits Fished		0	0	0	0	7	5	12
Chinook	Number	0	0	0	0	1	4	5
	Weight(lbs.)	0	0	0	0	10	40	50
Sockeye	Number	0	0	0	0	0	1	1
	Weight(lbs.)	0	0	0	0	0	11	11
Coho	Number	0	0	0	0	680	1,079	1,759
	Weight(lbs.)	0	0	0	0	5,212	7,760	12,972
Pink	Number	0	0	0	0	0	0	0
	Weight(lbs.)	0	0	0	0	0	0	0
Chum	Number	0	0	0	0	261	339	600
	Weight(lbs.)	0	0	0	0	2,091	2,464	4,555
Totals	Number	0	0	0	0	942	1,423	2,365
	Weight(lbs.)	0	0	0	0	7,313	10,275	17,588

Table 2. Tier 1 subsistence salmon harvest by Nome area fishers, Norton Sound, 2002.

	Number of Permits			Number of Salmon Harvested					
	Issued	Returned	Fished	Chinook	Sockeye	Coho	Pink	Chum	Total
Marine Waters	33	26	11	1	4	141	153	70	369
Nome River	28	20	5	0	4	95	101	64	264
Snake River	0	0	0	0	0	0	0	0	0
Eldorado River	7	4	3	0	0	0	156	0	156
Flambeau River	1	0	0	0	0	0	0	0	0
Bonanza River	15	11	8	0	0	59	184	22	265
Safety Sound	12	11	4	0	0	12	211	39	262
Solomon River	6	3	0	0	0	0	0	0	0
Penny River	0	0	0	0	0	0	0	0	0
Cripple Creek	0	0	0	0	0	0	0	0	0
Sinuk River	1	0	0	0	0	0	0	0	0
Feather River	0	0	0	0	0	0	0	0	0
Fish River	1	1	1	0	0	0	80	0	80
Niukluk River	16	13	9	0	0	80	509	32	621
Port Clarence	0	0	0	0	0	0	0	0	0
Kuzitrin River	2	1	0	0	0	0	0	0	0
Pilgrim River	26	20	8	18	165	20	4	13	220
Unknown River	1	1	0	0	0	0	0	0	0
Total	149	111	49	19	173	407	1,398	240	2,237

Table 3. Tier II subsistence salmon harvest by Nome area fishers, Norton Sound, 2002

	Number of Permits			Number of Salmon Harvested					
	Issued [a]	Returned	Fished	Chinook	Sockeye	Coho	Pink	Chum	Total
Marine Waters	28	28	21	0	71	270	1,547	689	2,577
Nome River	0	0	0	0	0	0	0	0	0
Snake River	0	0	0	0	0	0	0	0	0
Eldorado River	5	5	5	0	0	89	565	85	739
Flambeau River	0	0	0	0	0	0	0	0	0
Bonanza River	1	1	1	3	0	0	3	0	6
Safety Sound	2	2	2	0	0	0	201	115	316
Solomon River	0	0	0	0	0	0	0	0	0
Penny River	0	0	0	0	0	0	0	0	0
Cripple Creek	0	0	0	0	0	0	0	0	0
Sinuk River	2	1	1	0	0	0	40	30	70
Feather River	0	0	0	0	0	0	0	0	0
Fish River	0	0	0	0	0	0	0	0	0
Niukluk River	0	0	0	0	0	0	0	0	0
Port Clarence	0	0	0	0	0	0	0	0	0
Kuzitrin River	0	0	0	0	0	0	0	0	0
Pilgrim River	0	0	0	0	0	0	0	0	0
Unknown River	0	0	0	0	0	0	0	0	0
Total	38	37	30	3	71	359	2,356	919	3,708

[a] Two Tier II fishers never picked up their permit.

Table 4. Salmon survey counts of Norton Sound streams and associated salmon escapement goal ranges (SEG, BEG or OEG) for 2002. (Page 1 of 2)

Stream Name	Chinook				Chum				Coho			
	Weir/ Tower Count	Escapement Goal Range	Aerial Survey Count	Escapement Goal Range	Weir/ Tower Count	Escapement Goal Range	Aerial Survey Count	Escapement Goal Range	Weir/ Tower Count	Escapement Goal Range	Aerial Survey Count	Escapement Goal Range
Salmon L.												
Grand Central R.												
Pilgrim R.	168				5,538				216			
Glacial L.												
Sinuk R.						4,000 - 6,200	1,682				1,290	
Cripple R.												
Penny R.												
Snake R.	7				2,669	1,600 - 2,500 [b]			396			
Nome R.	7				1,720	2,900 - 4,300 [b]			3,418			
Flambeau R.						4,100 - 6,300	1,876				186	
Eldorado R.	25				10,260	6,000 - 9,200 [b]			516			
Bonanza R.			8			2,300 - 3,400	595				1,080	
Solomon R.						1,100 - 1,600	325				515	
Fish R.				Combined				Combined				
Boston Cr.				100 - 250				23,200 - 46,400				
Niukluk R.	542				33,979				7,269		1,122	Combined
Ophir Cr.												950 - 1,900
Kwiniuk R.	1,632	300 - 550			37,864	11,500 - 23,000 [a]			6,459			650-1,300
Tubutulik R.			42 [a]			9,200 - 18,400 [a]	180 [a]					
Inglutalik R.												
Ungalik R.												
Shaktoolik R.			82	400 - 800			465				677	
Unalakeet R.			28	Combined			1,099	Combined			1,615	
Old Woman R.			33	550 - 1,100			236	2,400 - 4,800			347	
North R.	1,484	1,200 - 2,400			5,918				2,966		800	550-1,100

-Continued-

Table 4. (Page 2 of 2)

Stream Name	Sockeye				Pink			
	Weir/ Tower Count	Escapement Goal Range	Aerial Survey Count	Escapement Goal Range	Weir/ Tower Count	Escapement Goal Range	Aerial Survey Count	Escapement Goal Range
Salmon L.			3,520	Combined				
Grand Central R.			71	4,000 - 8,000				
Pilgrim R.	4,012				3,870			
Glacial L.	1,047			800 - 1,600				
Sinuk R.			1,105				28,487	
Cripple R.							2,900	
Penny R.							280	
Snake R.	8				4,042			
Nome R.	29				35,057	13,000		
Flambeau R.							1,102	
Eldorado R.	10				115,674			
Bonanza R.							17,095	
Solomon R.							9,170	
Fish R.								
Boston Cr.								
Niukluk R.					636,404	8,400		
Ophir Cr.								
Kwiniuk R.					1,114,616	12,500		
Tubutulik R.							182,000	
Inglutalik R.								
Ungalik R.								
Shaktoolik R.						48,000	29,250	
Unalakeet R.							16,090	
Old Woman R.							6,635	
North R.					321,756	8,500		

[a] Counts should be considered minimums due to counting conditions or well after peak spawning date.

[b] The Board of Fisheries also established an OEG with the same range as the BEG.

[c] This represents the OEG in regulation. The BEG is 10,000-20,000 for the Kwiniuk River and 8,000-16,000 (expanded aerial counts) for the Tubutulik River.

Table 5. Commercial salmon set gillnet catches from Shaktoolik, Subdistrict 5, Norton Sound, 2002.

Period Catch and Catch Per Unit Effort

Period	Length of period (hrs)	Date	# FM	Kings	King CPUE	Chum	Chum CPUE	Coho	Coho CPUE	Kings
1	24	7/25-7/26	0	NO FISHING EFFORT						
2	24	7/29-7/30	2	0	0.00	25	0.52	69	1.44	0
3	24	8/01-8/02	2	0	0.00	42	0.88	73	1.52	0
4	24	8/05-8/06	5	1	0.01	51	0.43	83	0.69	1
5	24	8/08-8/09	4	0	0.00	104	1.08	241	2.51	1
6	24	8/12-8/13	8	0	0.00	39	0.27	214	1.49	1
7	24	8/15-8/16	0	NO FISHING EFFORT						1
8	24	8/19-8/20	0	NO FISHING EFFORT						1
Total	192			1		281		680		

Total number of permits fished = 7

Table 6. Commercial salmon set gillnet catches from Unalakleet, Subdistrict 6, Norton Sound, 2002.

Period Catch and Catch Per Unit Effort

Period	Length of period (hrs)	Date	# FM	Kings	King	Chum	Chum	Coho	Coho
1	24	7/25-7/26	2	1	0.02	113	2.35	6	0.13
2	24	7/29-7/30	1	1	0.04	79	3.29	76	3.17
3	24	8/01-8/02	1	0	0.00	38	1.58	131	5.46
4	24	8/05-8/06	3	1	0.01	26	0.36	147	2.04
5	24	8/08-8/09	2	1	0.02	58	1.21	560	11.67
6	24	8/12-8/13	2	0	0.00	10	0.21	66	1.38
7	24	8/15-8/16	0	NO FISHING EFFORT					
8	24	8/19-8/20	1	0	0.00	15	0.63	93	3.88
Total	192			4		339		1,079	

Total number of permits fished = 5

Table 7. Norton Sound area subsistence salmon harvests, 2002.

	Total HH's	HH's Contacted	Chinook Reported Harvest	Chinook Est. Total[1]	Chum Reported Harvest	Chum Est. Total[1]	Pink Reported Harvest	Pink Est. Total[1]	Sockeye Reported Harvest	Sockeye Est Total[1]	Coho Reported Harvest	Coho Est. Total[1]	Total Reported Harvest	Total Est. Total[1]
Nome Permits[2]	141	113	4	4	1,114	1,114	3,161	3,161	79	79	666	666	5,024	5,024
Subdistrict 1	**141**	**113**	**4**	**4**	**1,114**	**1,114**	**3,161**	**3,161**	**79**	**79**	**666**	**666**	**5,024**	**5,024**
Golovin	47	39	35	42	949	1,144	6,492	7,827	55	66	812	979	8,343	10,058
Niukluk R. Permits[2]	17	14	0	0	32	32	569	569	0	0	80	80	701	701
White Mountain	65	59	25	27	661	706	5,599	6,014	0	0	544	581	6,829	7,328
Subdistrict 2	**129**	**112**	**60**	**69**	**1,642**	**1,882**	**12,680**	**14,430**	**55**	**66**	**1,436**	**1,640**	**16,873**	**18,087**
Elim	82	76	541	565	1,390	1,451	7,993	8,345	13	14	1,725	1,801	11,662	12,177
Subdistrict 3	82	76	541	565	1,390	1,451	7,993	8,345	13	14	1,725	1,801	11,662	12,177
Koyuk	84	76	511	557	3,643	3,971	5,551	6,049	0	0	467	509	10,172	11,086
Subdistrict 4	**84**	**76**	**511**	**557**	**3,643**	**3,971**	**5,551**	**6,049**	**0**	**0**	**467**	**509**	**10,172**	**11,086**
Shaktoolik	59	57	1,230	1,230	800	800	8,769	8,769	4	4	2,169	2,169	12,972	12,972
Subdistrict 5	**59**	**57**	**1,230**	**1,230**	**800**	**800**	**8,769**	**8,769**	**4**	**4**	**2,169**	**2,169**	**12,972**	**12,972**
Unalakleet[3]	225	222	2,310	2,367	3,164	3,877	13,958	15,557	278	280	4,604	4,988	24,314	27,069
Subdistrict 6	**225**	**222**	**2,310**	**2,367**	**3,164**	**3,877**	**13,958**	**15,557**	**278**	**280**	**4,604**	**4,988**	**24,314**	**27,069**
Stebbins	122	108	405	450	3,221	3,586	6,730	7,459	270	300	2,085	2,324	12,711	14,119
St. Michael	93	90	224	227	1,120	1,136	575	583	20	20	975	989	2,914	2,957
South Norton Sound	**215**	**198**	**629**	**678**	**4,341**	**4,722**	**7,305**	**8,043**	**290**	**320**	**3,060**	**3,313**	**15,625**	**17,075**
NORTON SOUND	935	864	5,285	5,469	16,094	17,817	69,417	64,364	719	763	14,127	15,086	95,642	103,490

NOTE: Harvests include salmon from subsistence fishing, rod and reel fishing (except in permit areas), removal from commercial catches, and test fisheries.

[1] Data from contacted households were expanded to households not contacted. If less than 30 or less than 50% of households in a community were contacted, then reported harvest is used for estimated harvest.

[2] Alaska Department of Fish and Game, Division of Commercial Fisheries, permit returns, 2002. Data not expanded.

[3] Unalakleet estimated harvests include 42 chinook, 692 chum, 1,522 pink, and 353 coho from the ADF&G test net fishery in addition to the survey results.

SOURCE: Alaska Department of Fish and Game, Division of Subsistence, household surveys, 2002.

Table 8. Subsistence salmon harvests, Port Clarence District, 2002.

			Chinook		Chum		Pink		Sockeye		Coho		Total	
	Total HH's	HH's Contacted	Reported Harvest	Est.[a] Total	Reported Harvest	Est.[a] Total	Reported Harvest	Est.[a] Total	Reported Harvest	Est.[a] Total	Reported Harvest	Est.[a] Total	Reported Harvest	Est.[a] Total
Brevig Mission	71	67	61	65	1,444	1,534	2,209	2,347	2,002	2,127	1,639	1,741	7,355	7,815
Pilgrim R. Permits[b]	28	21	18	18	13	13	4	4	165	165	20	20	220	220
Teller	77	71	44	50	1,007	1,152	908	1,043	1,262	1,440	378	433	3,599	4,117
PORT CLARENCE	**176**	**159**	**123**	**133**	**2,464**	**2,699**	**3,121**	**3,394**	**3,429**	**3,732**	**2,037**	**2,194**	**11,174**	**12,152**

[a] Data from contacted households were expanded to households not contacted. If less than 30 and less than 50% of households in a community were contacted, then reported harvest is used for estimated harvest.

[b] Alaska Department of Fish and Game, Division of Commercial Fisheries, permit returns, 2002. Data not expanded.

Table 9. Kotzebue District commercial catches of chum salmon, chinook salmon, and Dolly Varden by week, 2002.

Week	Number of Fishermen	Chum			Chinook			Dolly Varden		
		Number	Pounds	Avg. Wt.	Number	Pounds	Avg. Wt.	Number	Pounds	Avg. Wt.
7/14 - 7/20	1	20	160	8.0	0	0	0.0	0	0	0.0
7/21 - 727	1	629	5,713	9.1	0	0	0.0	0	0	0.0
7/28 - 8/3	2	1,919	18,084	9.4	0	0	0.0	0	0	0.0
8/4 - 8/10	2	2,202	19,644	8.9	0	0	0.0	0	0	0.0
8/11 - 8/17	2	578	5,190	9.0	0	0	0.0	0	0	0.0
8/18 - 8/24	1	3,042	25,550	8.4	0	0	0.0	0	0	0.0
Totals	3	8,390	74,341	8.9	0	0	0.0	0	0	0.0

Table 10. Kobuk River drift test fish cumulative Catch Per Unit Effort (CPUE) for chum salmon, 1993-2002.

	1993		1994		1995		1996		1997		1998		1999		2000		2001		2002	
Date	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
10-Jul							15.00	27.77	0.00	8.85	5.22	5.22			2.50	4.61	8.39	24.97	6.83	35.60
11-Jul							98.38	126.15	5.31	14.16	0.85	6.07	0.00	0.00	3.44	8.05	20.07	45.04	22.85	58.26
12-Jul	11.18	11.18			0.00	0.00	45.64	171.79	7.19	18.35	a	6.07	0.00	0.00	3.45	11.50	12.63	57.67	31.54	89.80
13-Jul	14.22	25.40	0.00	0.00	0.93	0.93	74.29	246.08	a	18.35	15.89	21.96	0.00	0.00	2.54	14.04	17.32	74.99	21.67	111.47
14-Jul	20.57	45.97	2.68	2.68	2.80	3.73	a	246.08	6.35	24.69	7.53	29.49	0.00	0.00	8.57	22.61	45.57	120.56	28.06	139.52
15-Jul	35.08	81.05	2.58	5.26	2.77	6.50	83.75	329.73	3.65	28.25	14.07	43.56	0.00	0.00	0.87	23.48	38.86	159.42	14.27	153.79
16-Jul	13.19	94.24	11.35	16.61	a	6.50	71.35	401.08	14.28	42.53	17.33	60.89	0.00	0.00	3.38	26.86	32.80	192.22	35.27	189.06
17-Jul	17.27	111.51	a	16.61	0.00	6.50	55.49	456.57	15.17	57.7	5.07	65.96	4.26	4.26	12.77	39.63	48.77	240.99	36.50	225.56
18-Jul	a	111.51	7.16	23.77	1.81	8.31	89.36	546.43	16.12	73.82	9.02	74.98	8.48	12.74	3.58	43.21	36.98	277.97	24.41	249.97
19-Jul	10.71	122.22	12.4	36.17	9.89	18.20	54.74	601.17	17.98	91.8	a	74.98	5.89	18.63	19.51	62.72	67.06	345.05	30.30	280.27
20-Jul	2.76	124.98	3.05	39.62	16.3	34.50	63.7	664.87	a	91.8	18.66	93.64	5.11	23.74	14.57	77.29	26.05	371.10	44.91	325.18
21-Jul	3.2	128.18	7.39	47.12	38.84	73.04	52.12	716.99	18.53	110.33	11.87	105.51	23.75	47.49	27.69	104.98	29.51	400.61	36.30	361.48
22-Jul	5.52	133.7	3.56	50.68	21.18	94.22	50.97	767.96	13.28	123.61	0.00	105.51	11.91	59.40	41.00	145.98	106.97	509.58	33.85	395.33
23-Jul	27.15	160.85	16.49	67.17	50.58	144.8	91.35	859.32	10.79	134.4	29.58	135.09	6.09	65.49	16.28	162.27	50.79	560.37	40.00	435.33
24-Jul	9.08	169.91	a	67.17	28.46	173.26	91.89	951.21	22.86	157.26	27.33	162.42	24.95	90.44	14.62	176.89	58.96	619.33	62.76	498.09
25-Jul	a	169.91	14.38	81.55	40.16	213.42	76.80	1,028.01	21.57	178.83	24.68	187.1	28.73	119.17	22.98	199.87	80.59	699.92	45.64	543.73
26-Jul	15.22	185.13	47.65	129.2	35.15	248.57	55.68	1,083.69	14.66	193.49	a	187.1	39.72	158.89	40.28	240.15	94.06	793.98	34.29	578.02
27-Jul	8.06	193.19	40.66	169.86	63.94	312.51	29.79	1,113.48	18.45	211.95	23.81	211.01	80.39	239.28	41.52	281.67	95.06	889.04	50.41	628.43
28-Jul	16.39	209.58	67.83	237.69	62.49	375.00	48.08	1,162.54	30.53	242.48	51.91	262.92	a	239.28	62.34	344.01	58.24	947.28	a	628.43
29-Jul	0.93	210.48	33.62	281.31	46.11	421.11	70.13	1,232.67	28.13	270.61	34.16	297.08	55.00	294.28	96.00	440.01	64.33	1,001.61	25.74	654.17
30-Jul	0.92	211.4	69.21	350.52	57.66	478.57	35.29	1,267.96	22.33	292.94	24.59	321.67	49.66	343.94	138.20	578.21	35.36	1,036.97	28.90	683.07
31-Jul	12.58	223.98	a	350.52	29.89	508.89	82.27	1,350.23	32.57	325.51	15.69	337.36	160.53	504.47	85.87	664.09	38.63	1,075.60	18.33	701.40
1-Aug	a	223.98	82.16	412.68	72.91	581.77	167.87	1,517.90	41.41	366.92	26.44	362.8	145.02	649.49	101.16	765.24	61.50	1,137.10	27.85	729.25
2-Aug	6.74	230.72	65.12	477.80	48.71	630.48	52.02	1,579.92	22.41	389.33	a	362.8	41.67	691.16	64.37	829.61	16.55	1,153.65	19.93	749.18
3-Aug	54.49	285.21	71.79	549.59	48.40	678.88	48.70	1,628.62	35.21	424.54	26.67	389.47	33.19	724.35	44.32	873.93	44.21	1,197.86	25.31	774.49
4-Aug	44.23	329.44	108.98	658.57	53.00	731.88	65.93	1,694.55	26.67	451.21	42.35	431.82	74.23	798.58	77.14	951.07	30.71	1,228.57	a	774.49
5-Aug	88.3	418.74	59.74	718.31	49.95	781.83	60.33	1,754.88	24.47	475.68	8.57	440.39	108.04	906.62	67.26	1,018.33	43.64	1,272.21	12.86	787.35
6-Aug	18.6	437.34	102.56	820.87	a	781.83	80.47	1,835.35	42.26	517.93	6.00	446.39	82.79	989.41	39.92	1,057.25	30.00	1,302.21	23.09	810.49
7-Aug	20.52	457.86	a	820.87	46.39	828.22	91.58	1,926.34	35.09	553.93	5.11	451.50	62.73	1,072.14	37.50	1,094.75	29.31	1,326.52	10.18	820.68
8-Aug	a	457.86	62.75	883.62	44.02	872.24	146.94	2,073.28	45.07	599.00	16.40	467.90	a	1,072.14	93.37	1,188.12	34.40	1,362.92	11.96	832.64
9-Aug	1.84	459.7	96.86	980.48	68.22	940.46	109.11	2,179.39	55.14	654.14	17.20	485.10	55.58	1,127.72	81.50	1,269.62	23.01	1,385.93	8.60	841.14
10-Aug	12.63	472.33	45.83	1,026.31	56.33	996.79	56.95	2,236.34	a	654.14	9.45	494.56	44.73	1,172.45	113.87	1,383.49	54.88	1,440.81	15.27	856.41
11-Aug	18.11	490.44	57.02	1,083.33	37.05	1,034.74	a	2,236.34	43.45	697.59	10.29	504.85	58.10	1,230.56	50.57	1,434.06	73.64	1,514.45	11.10	867.51
12-Aug	3.74	494.18	90.54	1,173.87	63.02	1,097.76	72.29	2,308.63	37.36	734.95	19.44	524.29	48.50	1,279.06	24.86	1,458.92	47.23	1,561.68	7.66	875.17
13-Aug			11.36	1,185.23	a	1,097.76	114.63	2,423.26	45.93	780.88	10.21	534.50	78.37	1,357.43	14.57	1,473.49	13.04	1,574.72		
14-Aug			a	1,185.23	28.35	1,126.01	158.13	2,581.39	16.01	796.89	3.85	538.35			7.83	1,481.32				
15-Aug			5.13	1,190.36	25.26	1,153.27					0.00	538.35								
16-Aug			16.23	1,206.59	36.04	1,189.31														

* Regular day off

Table 11. Subsistence salmon harvests, Kotzebue Sound, 2002.

			Chinook		Chum		Pink		Sockeye		Coho		Total	
	Total HH's	HH's Contacted	Reported Harvest	Est.[a] Total	Reported Harvest	Est.[a] Total	Reported Harvest	Est.[a] Total	Reported Harvest	Est.[a] Total	Reported Harvest	Est.[a] Total	Reported Harvest	Est.[a] Total
Ambler[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Kiana[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Kobuk[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Kotzebue[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Noatak	101	90	0	0	2,628	2,937	0	0	0	0	10	11	2,636	2,948
Noorvik	115	101	3	3	12,542	13,943	7	8	8	9	40	44	12,600	14,007
Shungnak[b]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
KOTZEBUE SOUND	**216**	**191**	**3**	**3**	**15,168**	**16,880**	**7**	**8**	**8**	**9**	**50**	**56**	**15,236**	**16,955**

[a] The Kotzebue Sound communities of Ambler, Kiana, Kobuk, Kotzebue, and Shungnak, though normally included, were not surveyed in 2002.

Table 12. Daily observed peak biomass estimates of Pacific herring, Norton Sound District, 2002.

Date	Flight No.	Observer Initials	Survey		Spawn		Estimated Biomass (ST) By Index Area							
			Hours	Rating	No.	Length (mi)	KLK	UNK	CDB	NTB	ELM	GOL	NOM	TOTAL
5/20/2002	1	WJ,BB	2.8	3	25	0.5	9,040.9	332.1	598.3					9,971.3
5/21/2002	2	WJ,BB	2.8	4	52	12.0	7,978.9	1,298.9	5,714.5					14,992.3
5/22/2002	3	WJ,BB	3.1	4	39	13.5	7,189.7	0.0	5,385.2					12,574.9
5/23/2002	4	WJ,BB	2.9	4	34	10.8	2,738.5	0.0	12,164.2					14,902.7
5/24/2002	5	JM, WJ	2.0	4	3	0.5		0.0	6,955.2	0.0	0.0			6,955.2
5/25/2002	6	JM,BB	2.9	4	36	16.0	2,022.3	335.7	0.0					2,358.0
5/26/2002	7	WJ, AB	3.0	4	11	3.0	5,121.4	136.3	192.7					5,450.4
5/27/2002	8	JM, AB	2.9	4	12	3.5	2,815.1	0.0	313.0					3,128.1
5/28/2002	9	JM	2.5	4	1	0.3	243.0	6,029.0	684.8					6,956.8
5/29/2002	10	JM	3.3	4	2	0.1	922.8	1,074.9	215.3		0.0	0.0		2,213.0
5/31/2002	11	WJ	2.2	4	0	0.0	0.0	0.0	873.6					873.6
6/3/2002	12	WJ	4.6	3	25	3.8	392.9	0.0	676.8	1,831.8	1,971.2	188.6	0.0	5,061.3
6/4/2002	13	JM	1.5	2	0	0.0							0.0	0.0
6/4/2002	14	WJ	2.5	2	27	3.9	2,014.0	15,059.4	4,880.3					21,953.7
6/17/2002	15	JM	2.0	1	0	0.0					4,387.8	25.8	846.5	5,260.1
Sum			40.9	3	247	67.9							Total Harvest	1,123.0
													Survey Biomass	25,945.3
														27,068.3
													Exploit%	4.1%

Note: Biomass includes combined total harvest and spawn survey estimate.

Table 13. Sac roe herring harvest and effort by date and subdistrict, Norton Sound District, 2002.

	Subdistrict 1 (333-70)				Subdistrict 3 (333-74)				Combined Totals		
Date	Number Fishermen	Sac roe tons	Roe %	Bait tons	Number Fishermen	Sac roe tons	Roe %	Bait tons	Number Fishermen	Sac roe tons	
5/22					2	2.7	8.0	3.2	2	2.7	3.2
5/23	8	70.8	9.9	31.7	11	164.5	10.4	4.0	19	235.3	35.7
5/24	11	65.4	9.7		18	193.1	11.1	2.1	29	258.5	2.1
5/25					28	217.1	11.1	5.9	28	217.1	5.9
5/26					24	55.4	10.8	7.1	24	55.4	7.1
5/27	9	61.6	10.4		11	12.7	9.6	2.0	20	74.3	2.0
5/28	7	27.4	9.9		3	1.8	10.2		10	29.2	
5/29	11	11.5	10.7						11	11.5	
5/30	6	12.2	11.1						6	12.2	
5/31	11	32.7	10.7		4			6.9	15	32.7	6.9
6/1	8	12.8	10.2						8	12.8	
6/2	9	8.9	10.1						9	8.9	
6/3	5	2.6	9.0	0.9					5	2.6	0.9
Total [a]	26	339.8	10.1	32.6	33	719.2	10.8	31.2	46	1,059.0	63.8

Total harvest	1122.8
Total value paid	$160,088.57
Average per fishermen	$3,480.19

[a] 10% added to sac roe totals due to dewatering by buyers

Table 14. Daily catch (using fish ticket data) for the open access summer commercial king crab harvest, Norton Sound Section, Eastern Bering Sea, July 1 - August 6, 2002.

Date [a]	Landings	Number of Crab	Lbs of Crab Harvested	Cum lbs	No. of Pots Pulled	Average Weight (lbs)	CPUE
7/1/2002							
7/2/2002							
7/3/2002	1	56	153	153	20	2.7	2.8
7/4/2002	4	638	1,756	1,909	125	2.8	5.1
7/5/2002	3	832	2,468	4,377	56	3.0	14.9
7/6/2002	1	405	1,118	5,495	40	2.8	10.1
7/7/2002	1	309	794	6,289	40	2.6	7.7
7/8/2002	1	629	1,842	8,131	40	2.9	15.7
7/9/2002	6	3,639	10,435	18,566	272	2.9	13.4
7/10/2002	5	984	2,865	21,431	180	2.9	5.5
7/11/2002	4	1,041	2,873	24,304	118	2.8	8.8
7/12/2002	2	464	1,284	25,588	67	2.8	6.9
7/13/2002	3	1,669	5,318	30,906	151	3.2	11.1
7/14/2002	5	2,097	6,167	37,073	190	2.9	11.0
7/15/2002	7	2,798	8,429	45,502	329	3.0	8.5
7/16/2002	4	1,994	5,505	51,007	238	2.8	8.4
7/17/2002	7	4,848	14,079	65,086	285	2.9	17.0
7/18/2002	3	2,052	5,836	70,922	120	2.8	17.1
7/19/2002	1	541	1,561	72,483	60	2.9	9.0
7/20/2002	7	2,785	6,810	79,293	202	2.4	13.8
7/21/2002	6	2,789	8,638	87,931	266	3.1	10.5
7/22/2002	3	2,425	7,342	95,273	99	3.0	24.5
7/23/2002	5	2,120	6,608	101,881	200	3.1	10.6
7/24/2002	5	1,864	5,691	107,572	187	3.1	10.0
7/25/2002	2	408	1,312	108,884	49	3.2	8.3
7/26/2002	2	1,336	4,005	112,889	75	3.0	17.8
7/27/2002	4	3,239	10,119	123,008	147	3.1	22.0
7/28/2002	10	6,664	19,889	142,897	326	3.0	20.4
7/29/2002	2	1,743	5,189	148,086	65	3.0	26.8
7/30/2002	9	8,106	24,572	172,658	369	3.0	22.0
7/31/2002	6	4,559	14,267	186,925	215	3.1	21.2
8/1/2002	2	1,302	4,842	191,767	80	3.2	18.8
8/2/2002	3	1,260	3,804	195,571	120	3.0	10.5
8/3/2002	8	4,707	14,993	210,564	275	3.2	17.1
8/4/2002	6	1,875	5,852	216,416	184	3.1	10.2
8/5/2002	7	2,095	7,076	223,492	286	3.4	7.3
8/6/2002 [a]	12	5,124	15,631	239,123	347	3.1	14.8
8/7/2002	1	718	1,880	241,003	28	2.6	25.6
8/8/2002	4	977	2,663	243,666	87	2.7	11.2
8/9/2002	1	210	710	244,376	20	3.4	10.5
Totals	164	81,502	244,376		5,958	3.0	13.7

[a] The open access fishery ended 8/6, but deliveries were made until 8/9.

Table 15. Daily catch (using fish ticket data) for the CDQ summer commercial king crab harvest, Norton Sound Section, Eastern Bering Sea, June 15 - June 28, and August 9 - September 3, 2002.

Date	Landings	Number of Crab	Lbs of Crab Harvested	Cumulative Total (lbs)	No. of Pots Pulled	Average Weight (lbs)	CPUE
19-Jun	1	10	43	43	1	4.3	10.0
20-Jun	1	337	946	989	40	2.8	8.4
22-Jun	9	1,140	3,188	4,177	109	2.8	10.5
26-Jun	3	579	1,530	5,707	51	2.6	11.4
27-Jun	13	1,371	4,127	9,834	170	3.0	8.1
28-Jun	3	249	717	10,551	41	2.9	6.1
11-Aug	3	725	2,185	12,736	50	3.0	14.5
12-Aug	1	125	381	13,117	17	3.0	7.4
24-Aug	2	173	538	13,655	24	3.1	7.2
29-Aug	1	455	1,571	15,226	30	3.5	15.2
	37	5,164	15,226		533	2.9	9.7

Table 16. Commercial harvest of red king crab from Norton Sound Section by statistical area, Eastern Bering Sea, 2002 (summer fishery only).

Statistical Area	Number	Pounds	Pots Pulled	CPUE	Average Weight (Lbs.)
616331	1,202	3,506	143	8.4	2.92
626331	910	2,455	80	11.4	2.70
626401	17,969	53,722	1,099	16.4	2.99
636401	17,606	50,906	957	18.4	2.89
646330	664	1,955	80	8.3	2.94
656330	4,063	12,374	250	16.3	3.05
656401	21,460	63,038	1,557	13.8	2.94
666330	418	1,332	78	5.4	3.19
666401	11,134	35,970	1,060	10.5	3.23
666402	9,665	30,070	1,020	9.5	3.11
666431	1,575	4,274	167	9.4	2.71
Total	86,666	259,602	6,491	13.4	2.9

Table 17. Station data and number of red king crab, by sex, captured during the Alaska Department of Fish and Game, Norton Sound trawl survey, July 27 - August 9, 2002.

					Female Red King Crab		Male Red King Crab				
							Sublegal			Legal	
Haul #	Station No.	Distance towed (nmi)	Avg. Depth (fm)	Bottom temp. (°C)	Juveniles	Adults	Threes (<75 mm)	Twos (75 to 89 mm)	Ones (>89 mm)	Recruit	Postrecruit
1	184	1.0	12	10.06	3	4	3	2	3	2	2
2	184	1.0	12	9.81	2	2	5	4	2	3	4
3	183	1.0	18	9.98	4	14	10	12	11	2	14
4	183	1.0	14	10.24	6	23	2	7	12	1	15
5	182	1.0	8	11.85	0	0	0	0	0	0	1
6	181	1.0	6	12.26	0	0	0	0	0	0	0
7	203	1.0	9	11.68	0	1	0	0	0	0	0
8	202	1.0	7	11.04	0	0	0	0	0	0	0
9	180	1.0	8	11.01	2	0	1	0	0	0	0
10	179	1.0	9	10.39	0	0	1	0	0	0	0
11	201	0.5	6	14.69	0	0	0	0	0	0	0
12	201	1.0	6	14.37	0	0	0	0	0	0	0
13	178	1.0	9	9.24	0	0	0	0	0	0	0
14	150	1.0	8	9.18	0	0	0	0	0	0	0
15	123	1.0	8	8.61	0	0	0	1	0	0	2
16	124	1.0	9	7.63	0	0	0	1	0	0	0
17	151	1.0	10	8.43	0	2	1	0	0	0	0
18	152	1.0	12	7.39	0	0	0	0	0	0	0
19	125	1.0	8	8.41	0	2	0	0	0	0	0
20	126	1.0	9	8.08	0	3	1	0	1	0	1
21	153	1.0	9	8.07	0	3	0	0	0	0	1
22	154	1.0	9	11.23	1	0	2	0	0	0	0
23	127	1.0	8	9.33	0	3	1	0	1	0	0
24	128	1.0	8	x	0	0	0	0	0	0	0
25	155	1.0	8	x	3	0	1	0	0	0	0
26	156	1.5	7	x	0	0	0	1	0	0	0
27	129	1.5	9	11.23	0	0	0	0	0	0	1
28	129	1.5	9	9.67	0	5	0	1	0	0	0
29	130	1.5	8	5.93	0	1	2	2	0	0	1
30	157	1.5	7	11.09	0	0	0	1	0	0	3
31	158	1.4	8	x	0	1	0	0	0	0	2
32	131	1.3	8	x	0	5	0	0	1	0	0
33	132	1.5	9	5.91	0	1	1	5	3	0	4
34	159	1.4	9	7.76	0	2	0	1	0	1	1
35	185	1.4	10	10.40	4	4	7	1	1	0	2
36	204	1.4	8	10.82	0	0	0	0	0	0	0
37	186	1.4	11	x	0	0	0	1	1	0	1
38	187	1.3	13	1.33	0	0	0	0	0	0	1
39	161	1.4	13	1.48	0	0	0	0	0	0	0
40	160	1.4	11	1.70	0	0	0	0	0	0	1
41	133	1.4	11	1.70	0	0	0	0	0	0	2
42	134	1.4	14	1.60	0	0	0	0	0	0	1
43	135	1.4	15	2.17	0	1	0	0	1	0	0
44	107	1.4	15	2.88	0	0	0	0	0	0	0
46	82	1.4	13	2.42	0	0	0	0	0	0	0
48	81	1.4	13	2.00	0	0	0	0	0	0	0
47	106	1.4	13	1.96	0	0	0	0	0	0	0
48	105	1.5	10	3.11	0	0	0	0	2	0	2
49	80	1.5	10	2.13	0	0	0	0	0	0	2
50	79	1.4	8	6.57	0	0	0	1	4	0	1
51	104	1.4	8	7.75	0	1	2	2	3	1	2
52	78	1.4	7	9.69	0	0	0	0	0	0	0
53	103	1.4	7	10.74	3	1	0	0	0	0	0
54	156	1.4	7	11.02	0	1	0	0	0	0	0
55	155	1.4	8	10.34	5	1	15	2	0	0	0
56	128	1.4	7	10.82	0	0	0	0	0	0	0
57	127	1.4	8	9.04	1	9	0	0	0	0	3
58	154	1.4	9	10.70	3	1	0	0	0	0	0
59	153	1.4	9	8.32	0	4	0	0	0	0	1
60	126	1.4	9	8.67	1	2	0	2	8	3	2
61	125	1.4	8	8.26	1	13	2	0	0	0	0
62	152	1.4	12	7.41	3	1	3	1	3	0	0
63	151	1.5	10	8.21	0	4	0	0	0	0	0
64	124	1.4	8	7.50	0	1	0	0	0	0	0
65	123	1.5	8	6.78	0	0	1	0	1	2	1
66	150	1.4	7	8.68	0	1	0	0	0	0	0
67	149	1.4	9	8.31	0	0	0	0	1	0	1
68	148	1.4	8	6.19	0	2	0	0	0	0	0
69	121	1.4	8	5.07	0	0	1	0	0	0	0
70	94	1.3	7	7.34	0	1	0	0	0	0	0
71	95	1.4	7	9.08	0	0	0	0	0	0	0
72	122	1.4	8	6.08	0	0	1	0	0	0	3
73	126	1.4	9	10.05	2	8	1	7	9	2	4
74	101	1.4	8	11.30	0	0	0	0	0	0	0
75	101	1.4	8	12.17	0	0	0	0	0	0	0
76	102	1.4	7	12.02	0	0	0	0	0	0	0
					41	127	65	56	68	17	69

[a] Tows were redone due to problem with gear.

[b] No temperature data due to problem with temperature probe.

[c] Tow contained a large amount of mud.

[d] Tow redone due to rocks in the net effecting the fishing efficiency.

Notes: Juvenile female red king crab include all females with a carapace length < 72 mm that were nonovigerous and had hair down pleopodal setae.
Adult female red king crab include all ovigerous females and all non-ovigerous female crab with a carapace length > 72 mm.
Prerecruit ones include all sublegal male crab with a carapace length > 89 mm.
Legal male red king crab are those crab with a carapace width > 4.75 inches across.
Recruits are all legal newshell male crab with carapace length < 115 mm.
Postrecruits are all legal newshell crab with carapace length > 115 mm, and all old shell legal crab that have obtained legal width.
Stations resurveyed due to legal crab catch > 5 are indicated in bold.

Table 18. Winter 2001-2002 subsistence red king crab catches and effort by gear type, Eastern Bering Sea.

Gear Type	# Permits Fished [a]	# Males Caught	# Males Kept	# Females Caught	# Females Kept	Total Crab Captured	Total Crab Kept	Average Harvest per Fisher
Pots	64	8,204	3,639	594	25	8,798	3,664	57
Handlines	2	4	3	0	0	4	3	2
Both	1	3	2	0	0	3	2	2
Unknown	0	0	0	0	0	0	0	0
Totals	67	8,211	3,644	594	25	8,805	3,669	55

[a] Number of permits given out = 114
Number of permits returned = 101

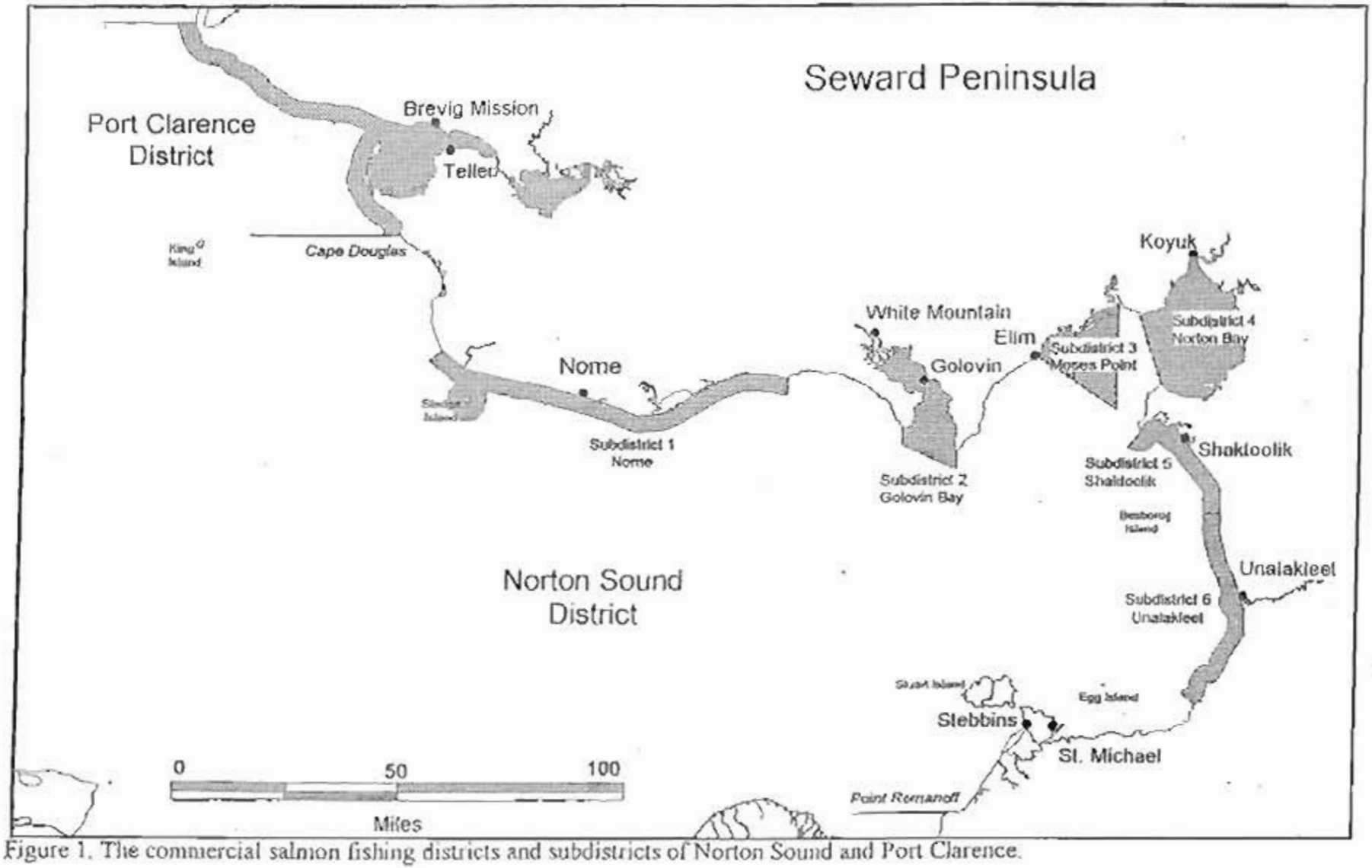


Figure 1. The commercial salmon fishing districts and subdistricts of Norton Sound and Port Clarence.

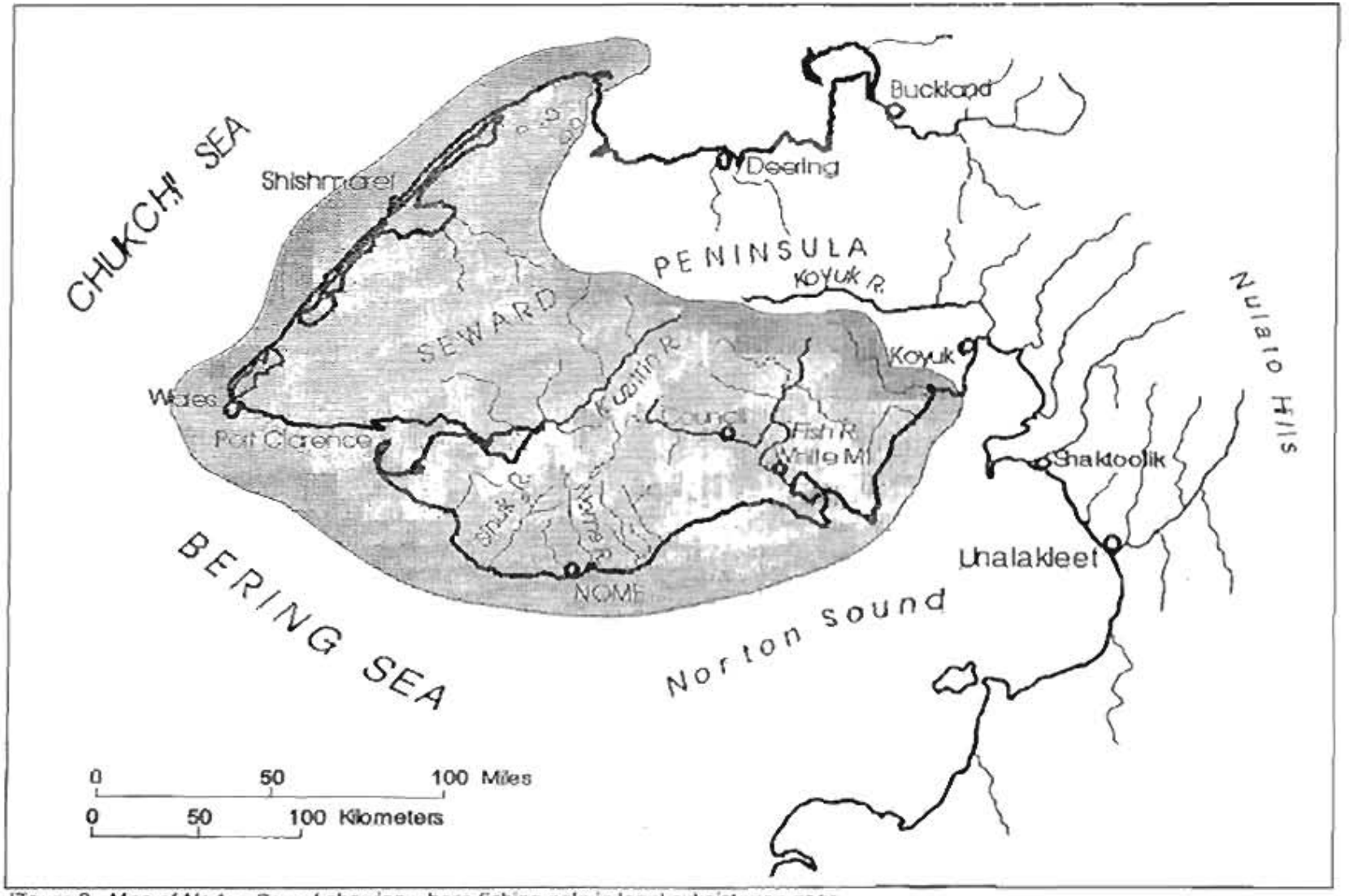


Figure 2. Map of Norton Sound showing where fishing pole is legal subsistence gear.

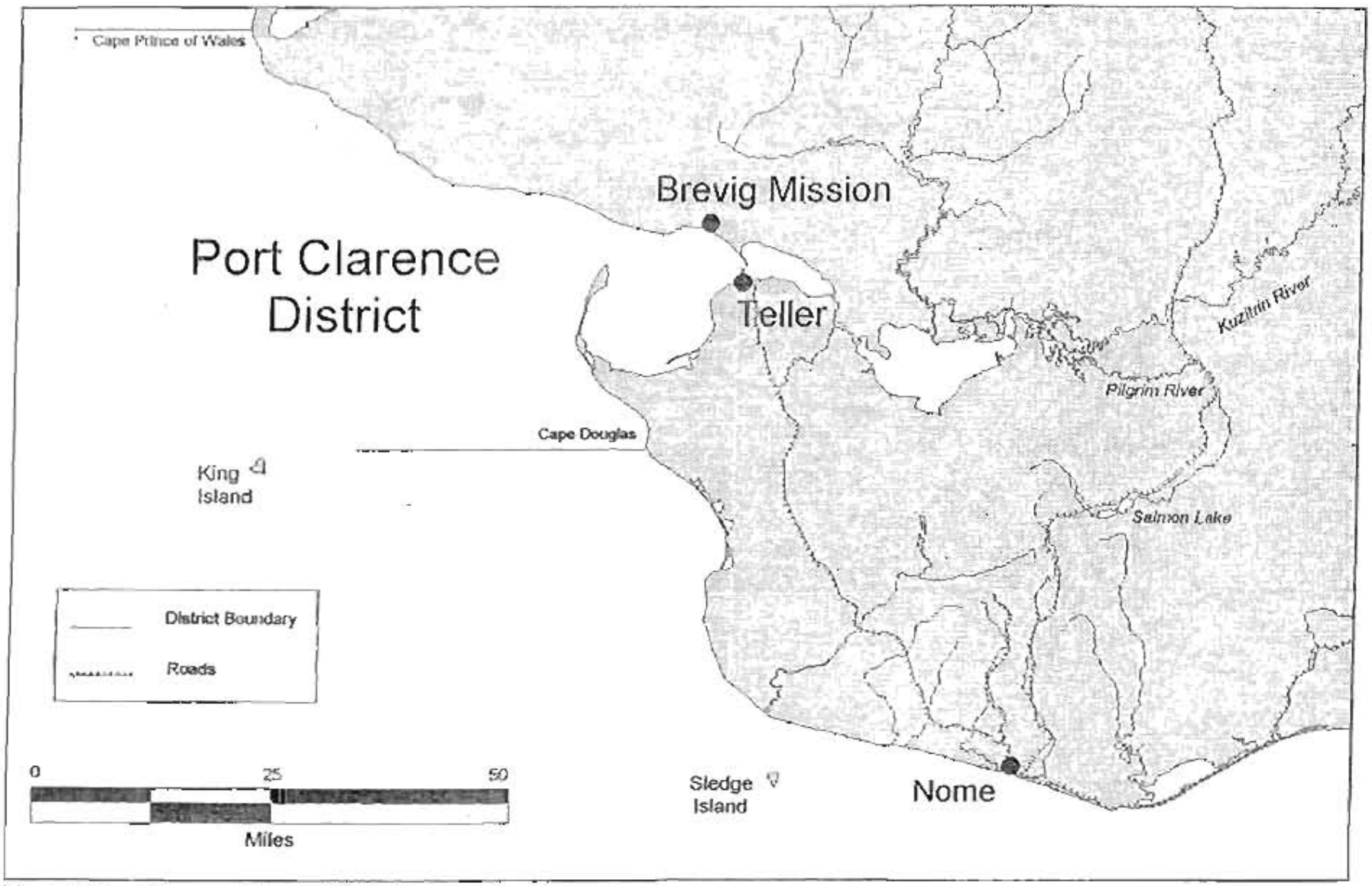


Figure 3. Port Clarence Salmon District.

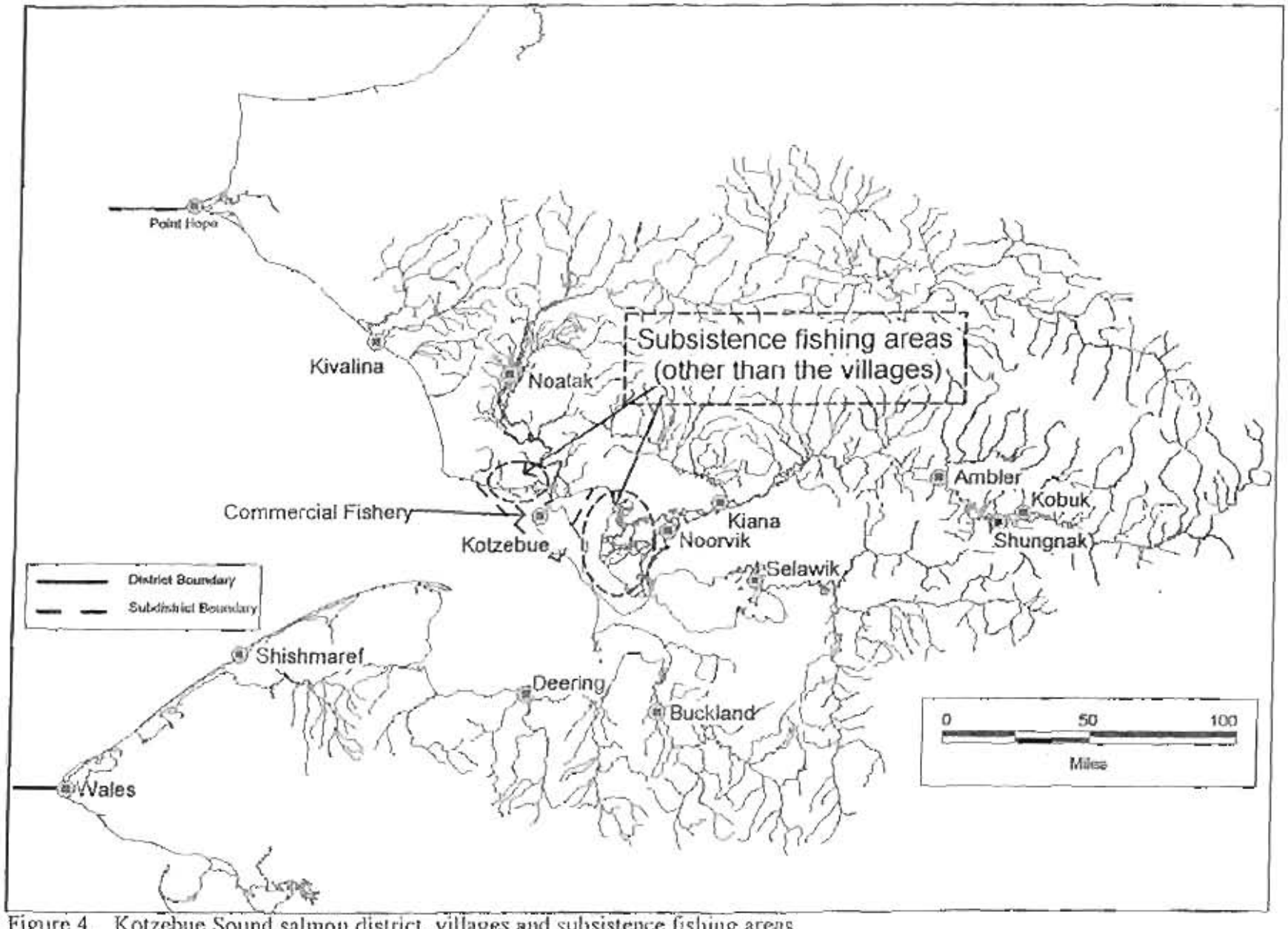


Figure 4. Kotzebue Sound salmon district, villages and subsistence fishing areas.

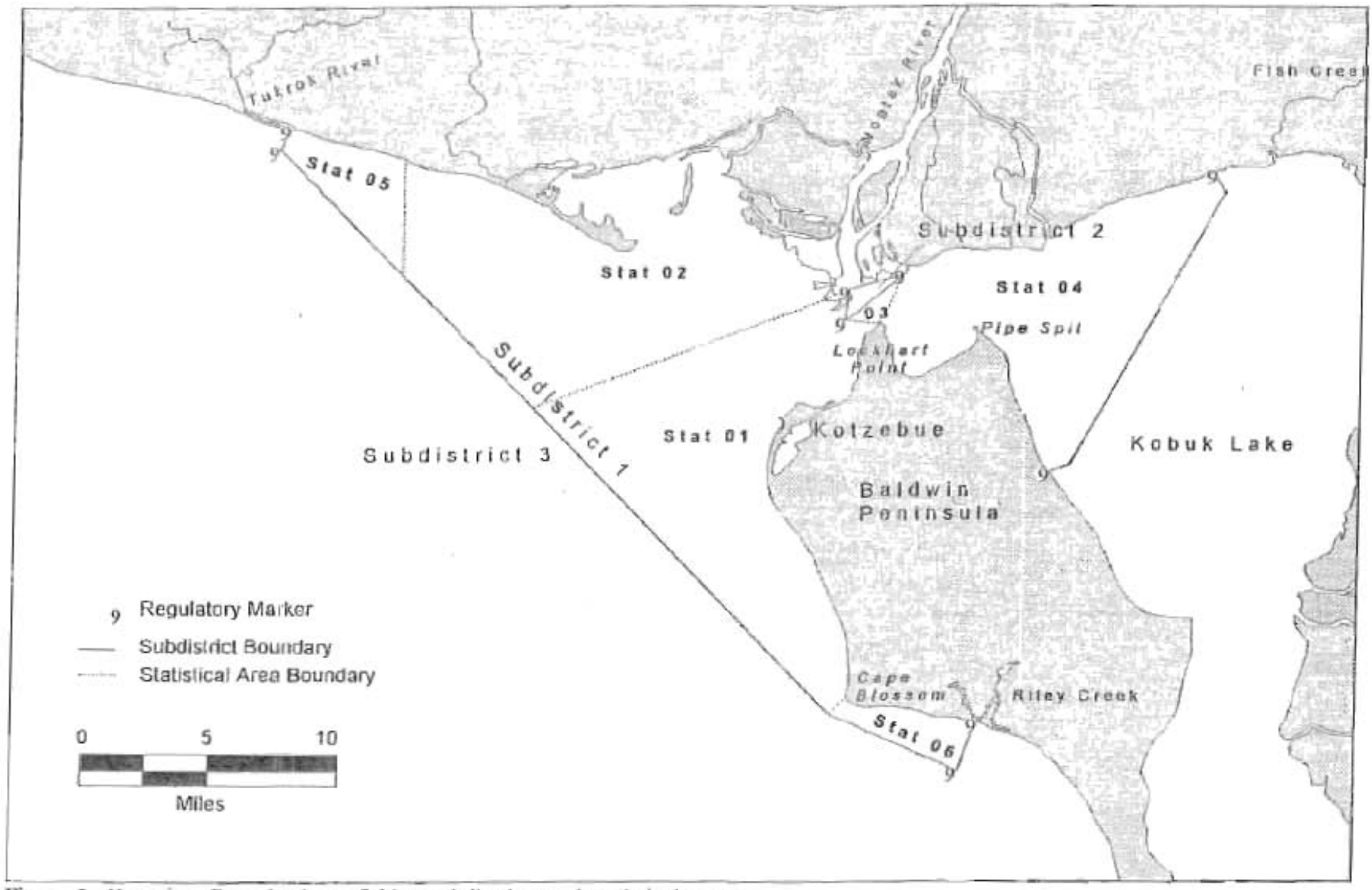


Figure 5. Kotzebue Sound salmon fishing subdistricts and statistical areas.

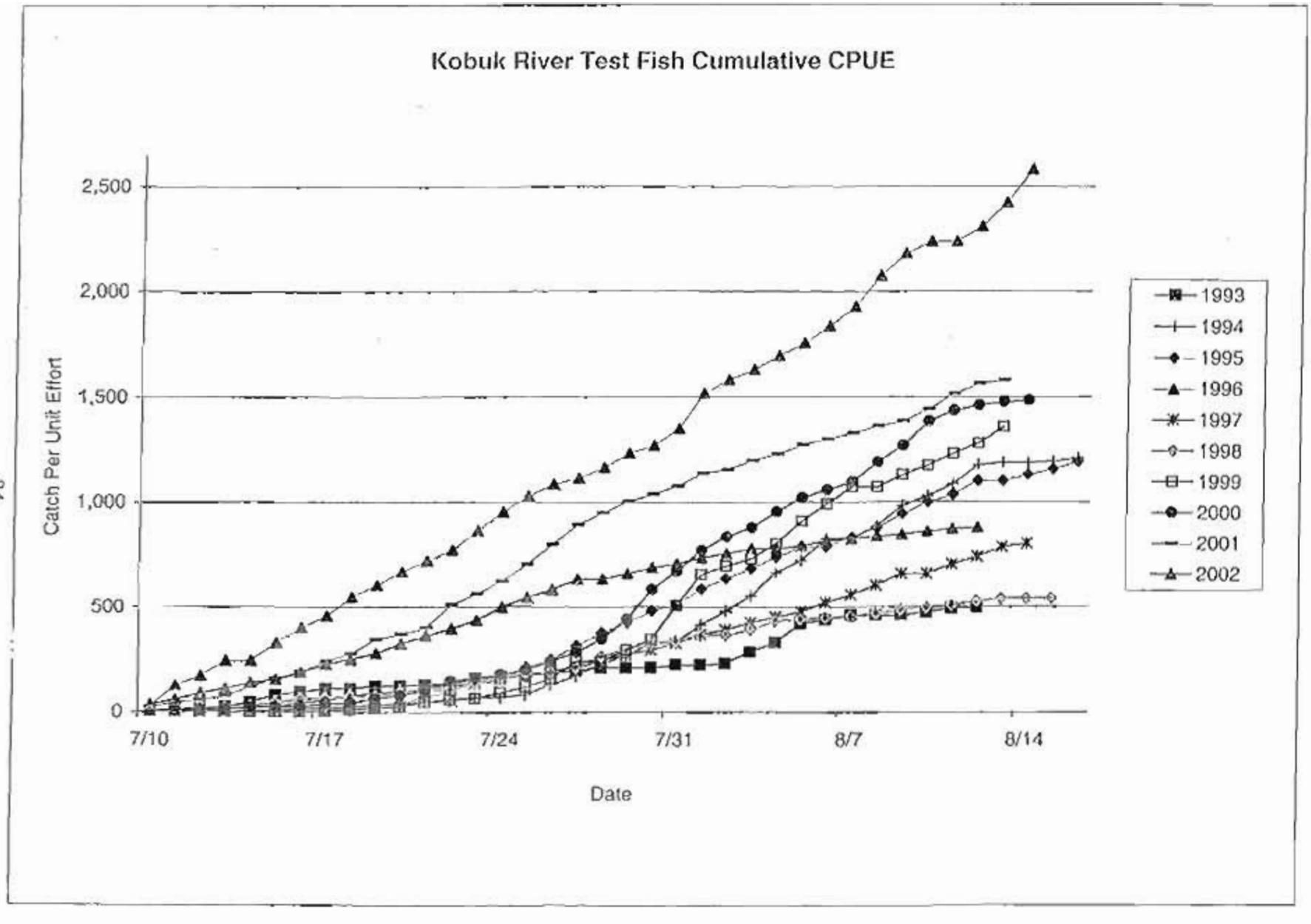


Figure 6. Kobuk River drift test fish cumulative Catch Per Unit Effort (CPUE) for chum salmon, 1993-2002.

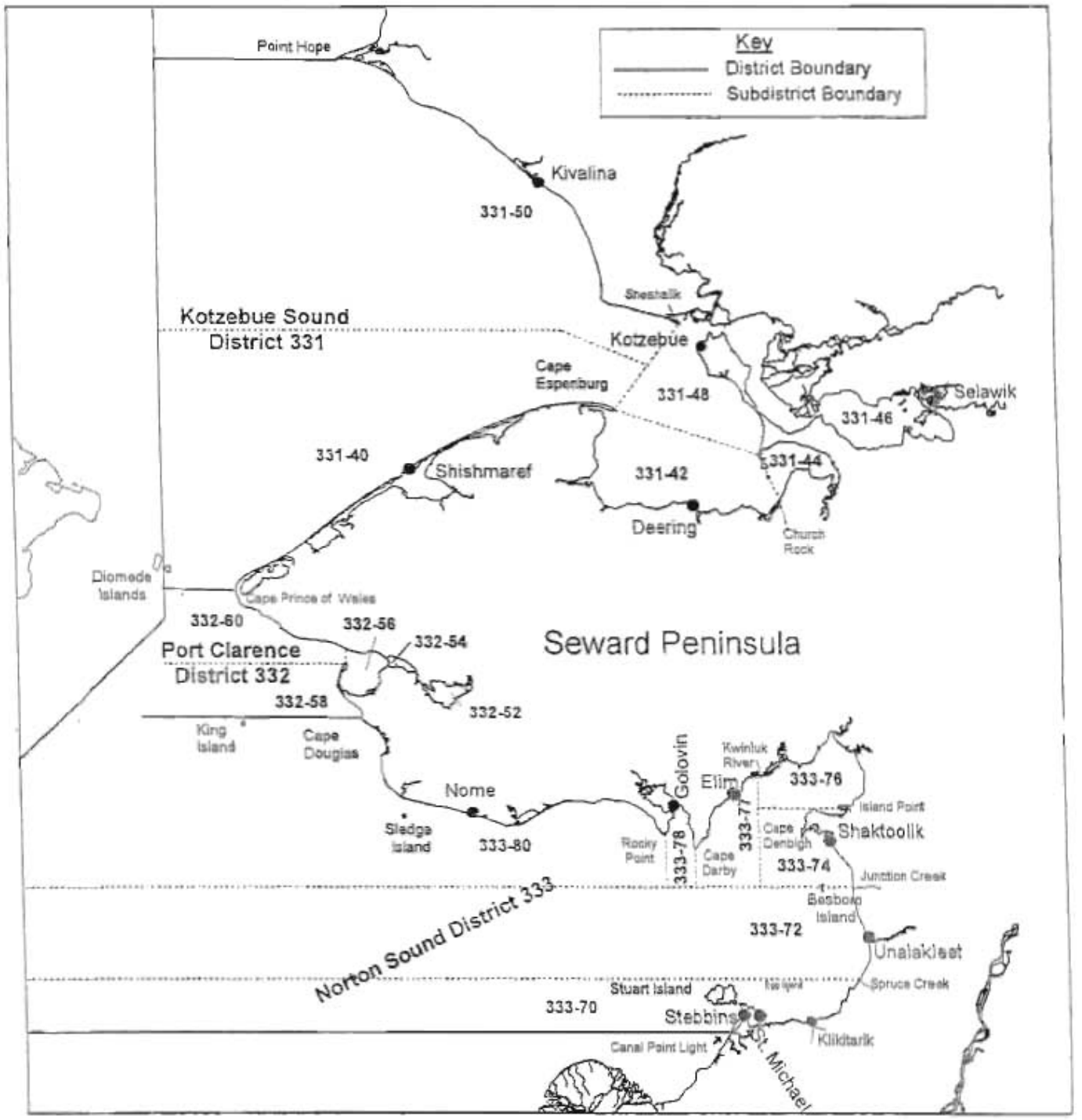


Figure 7. Statistical areas of the Norton Sound, Port Clarence and Kotzebue Sound commercial herring fishing districts.

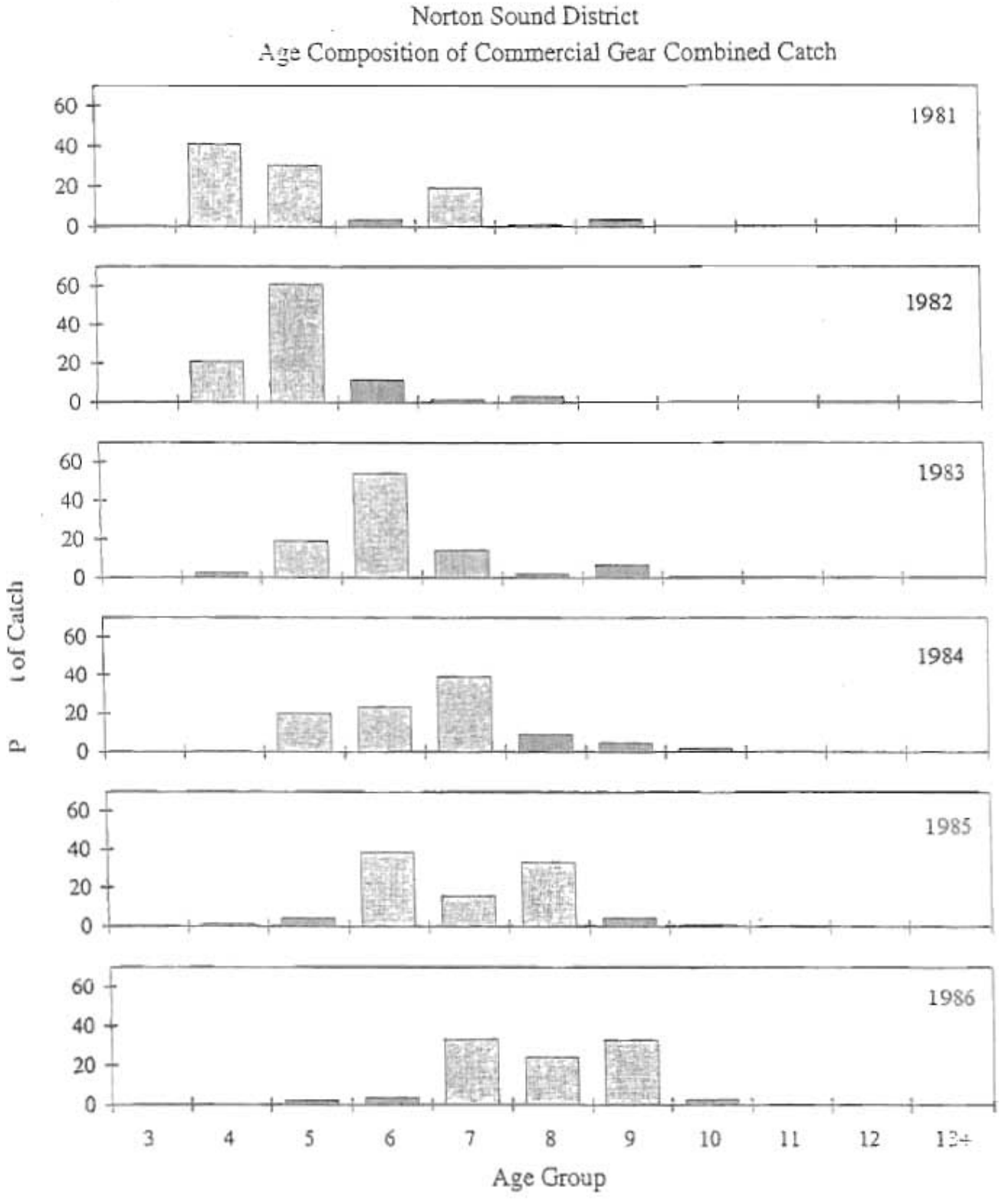


Figure 8. Norton Sound herring age class composition by percentage of commercial catch, commercial gear combined (beach seine and gillnet), 1981-2002. (page 1 of 4)

Norton Sound District
Age Composition of Commercial Gear Combined

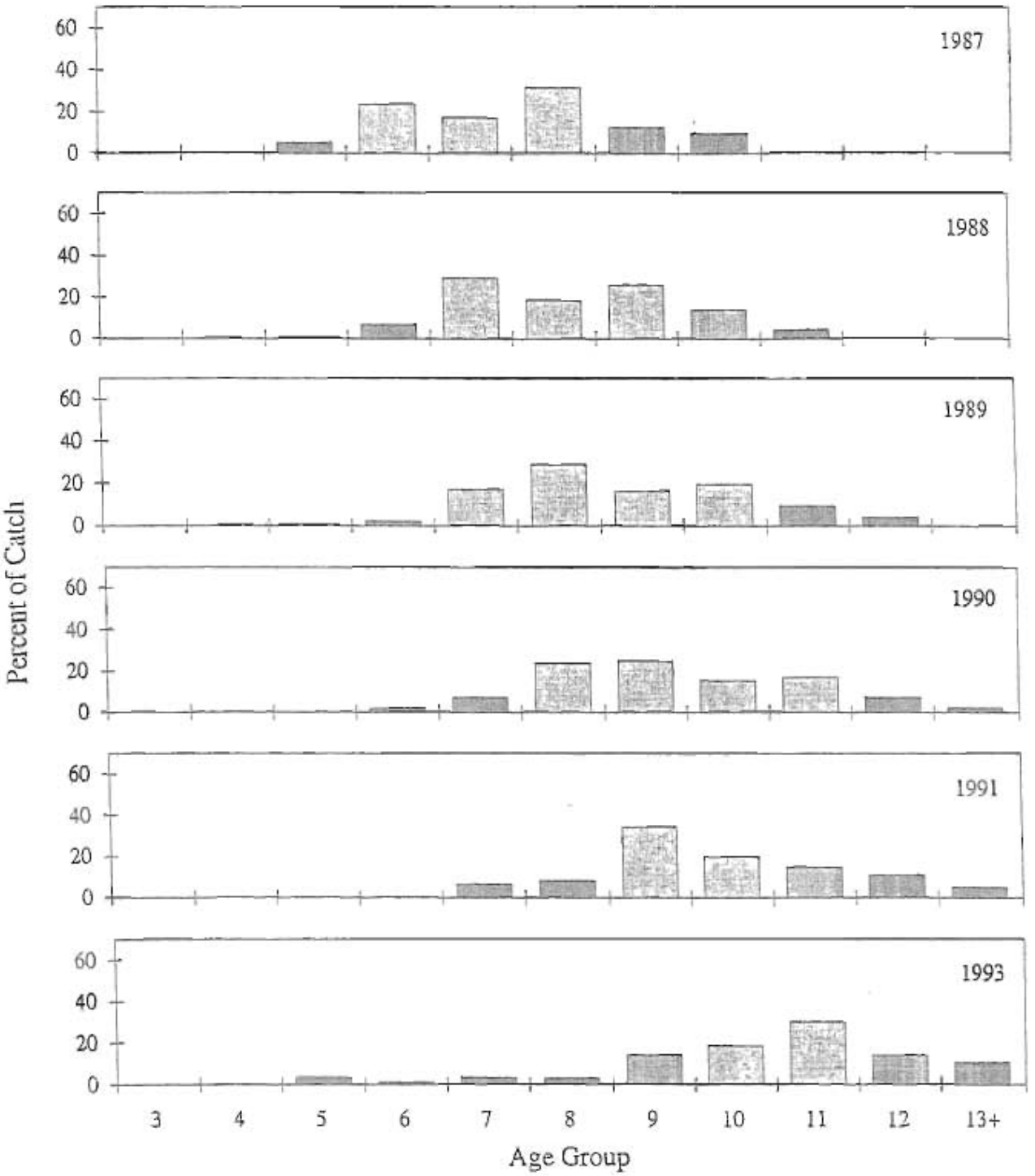


Figure 8. (page 2 of 4)
note: No commercial fishing occurred in 1992.

Norton Sound District
Age Composition of Commercial Gear Combined

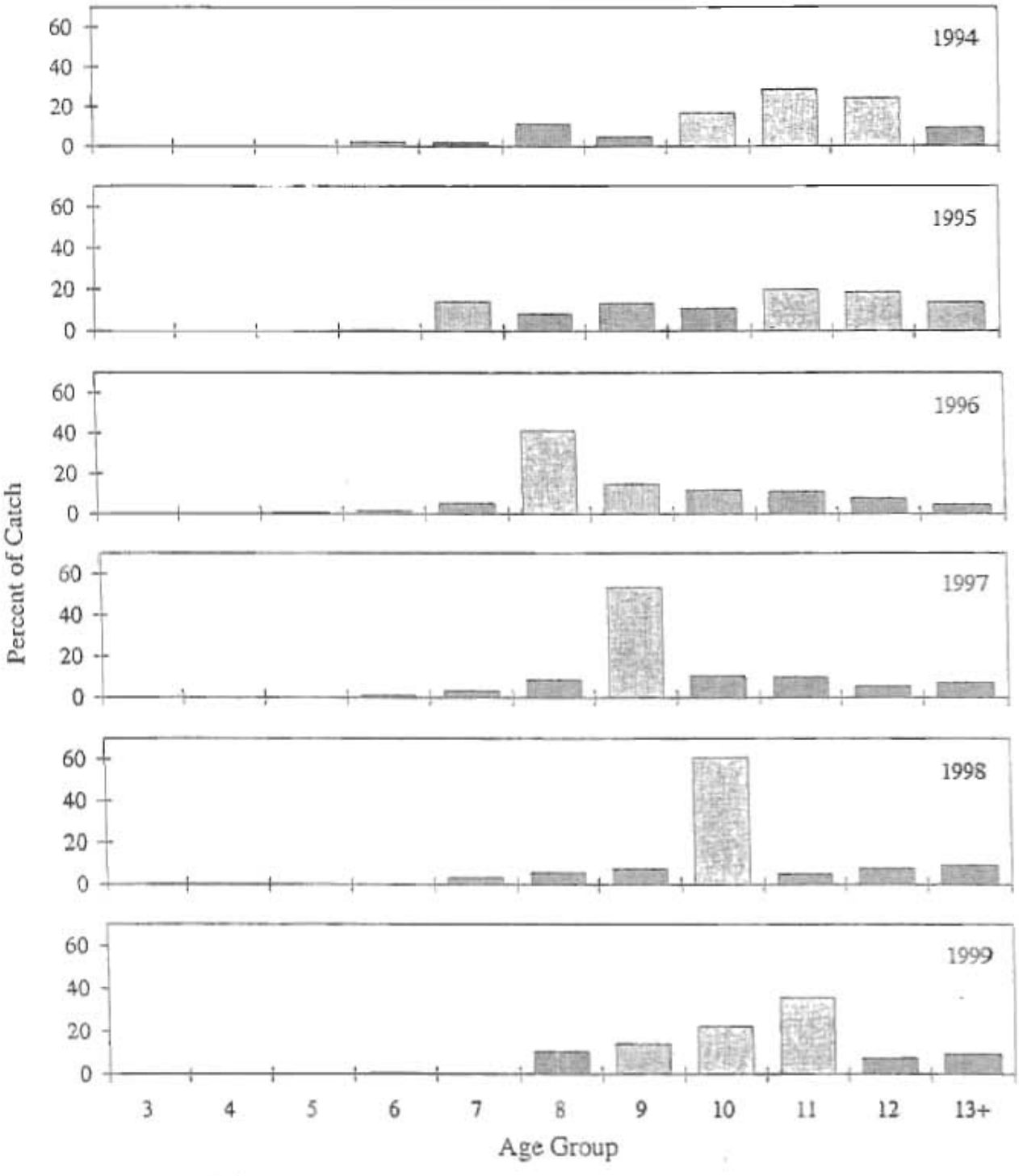


Figure 8. (page 3 of 4)
Note: No commercial catch from beach seine gear in 1998 and 1999.

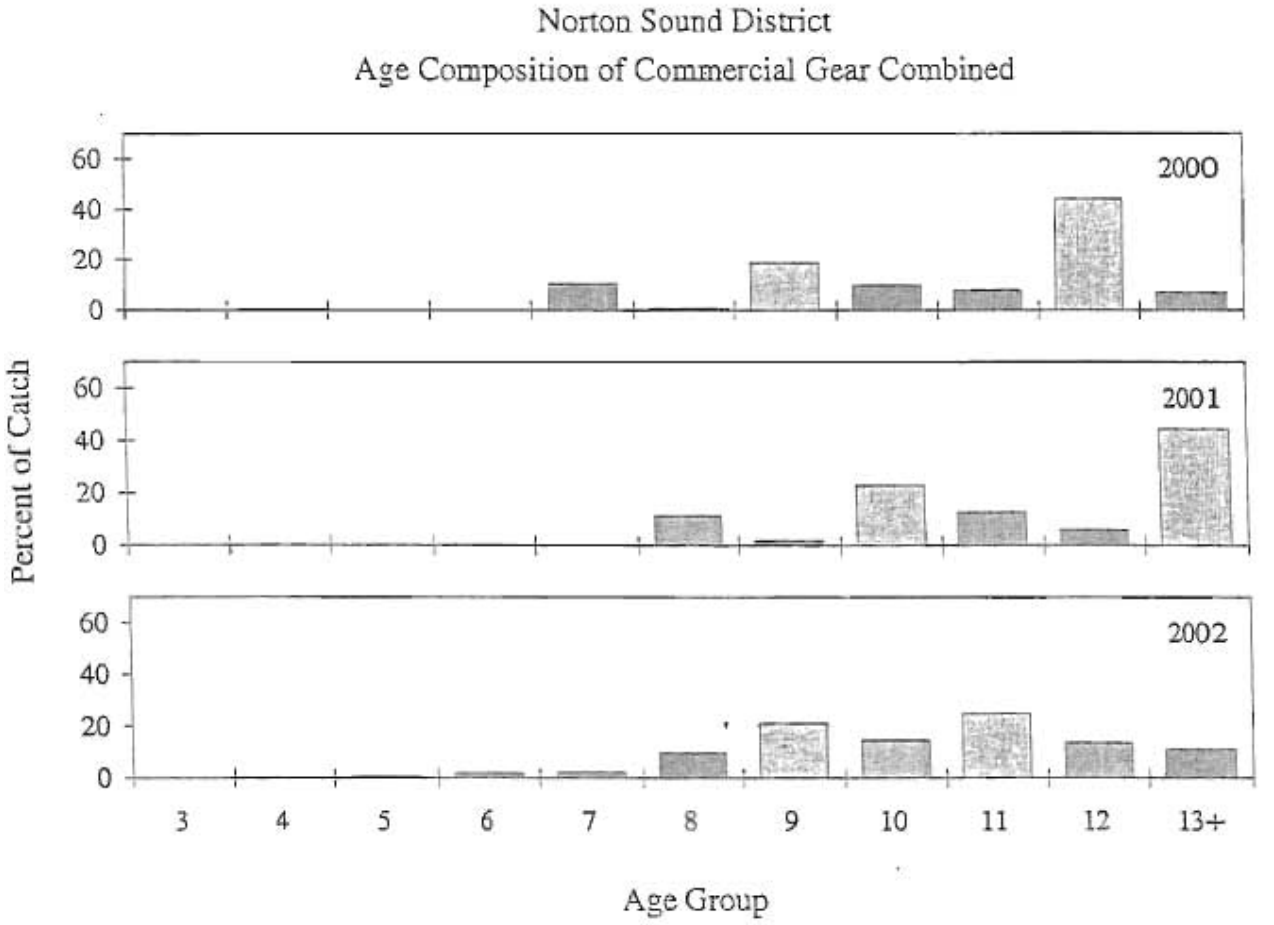


Figure 8. (page 4 of 4)
Note: No commercial catch from beach seine gear in 2001 and 2002.

Norton Sound District

Age Composition of Variable Mesh Gillnets Catch

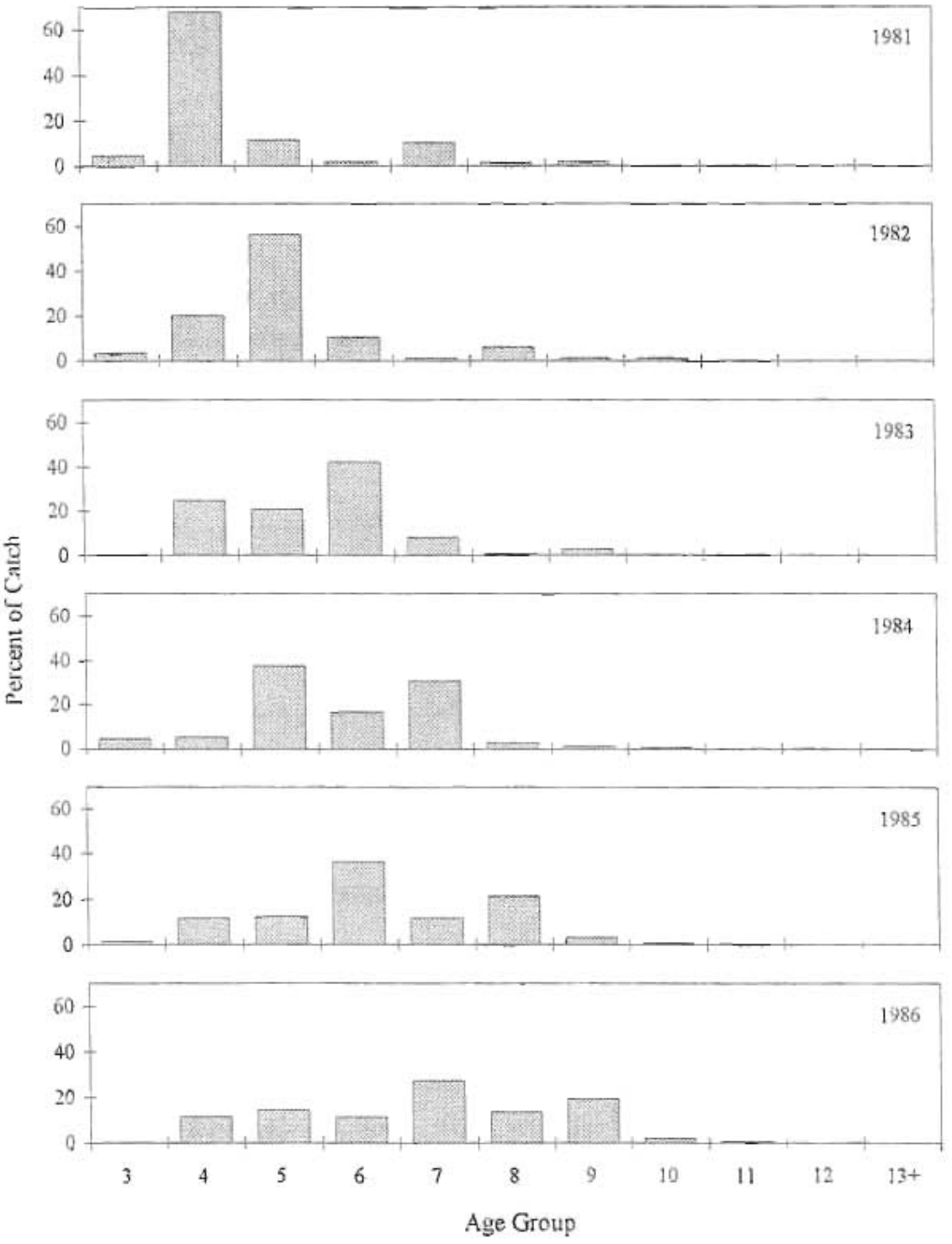


Figure 9. Norton Sound herring age class composition by percentage of total catch, variable mesh gillnets, 1981-2002. (page 1 of 4)

Norton Sound District
Age Composition of Variable Mesh Gillnets Catch

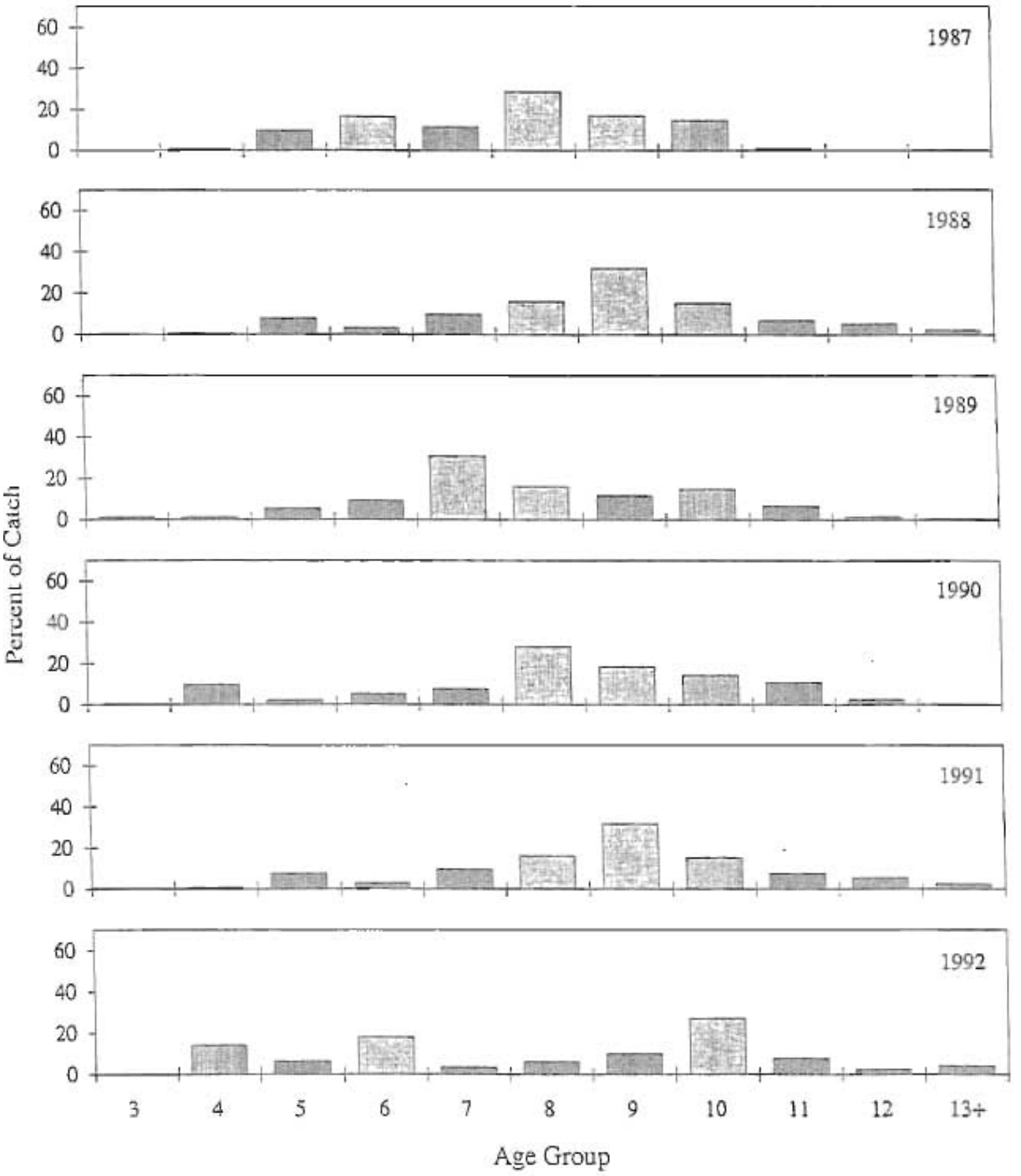


Figure 9. (page 2 of 4)

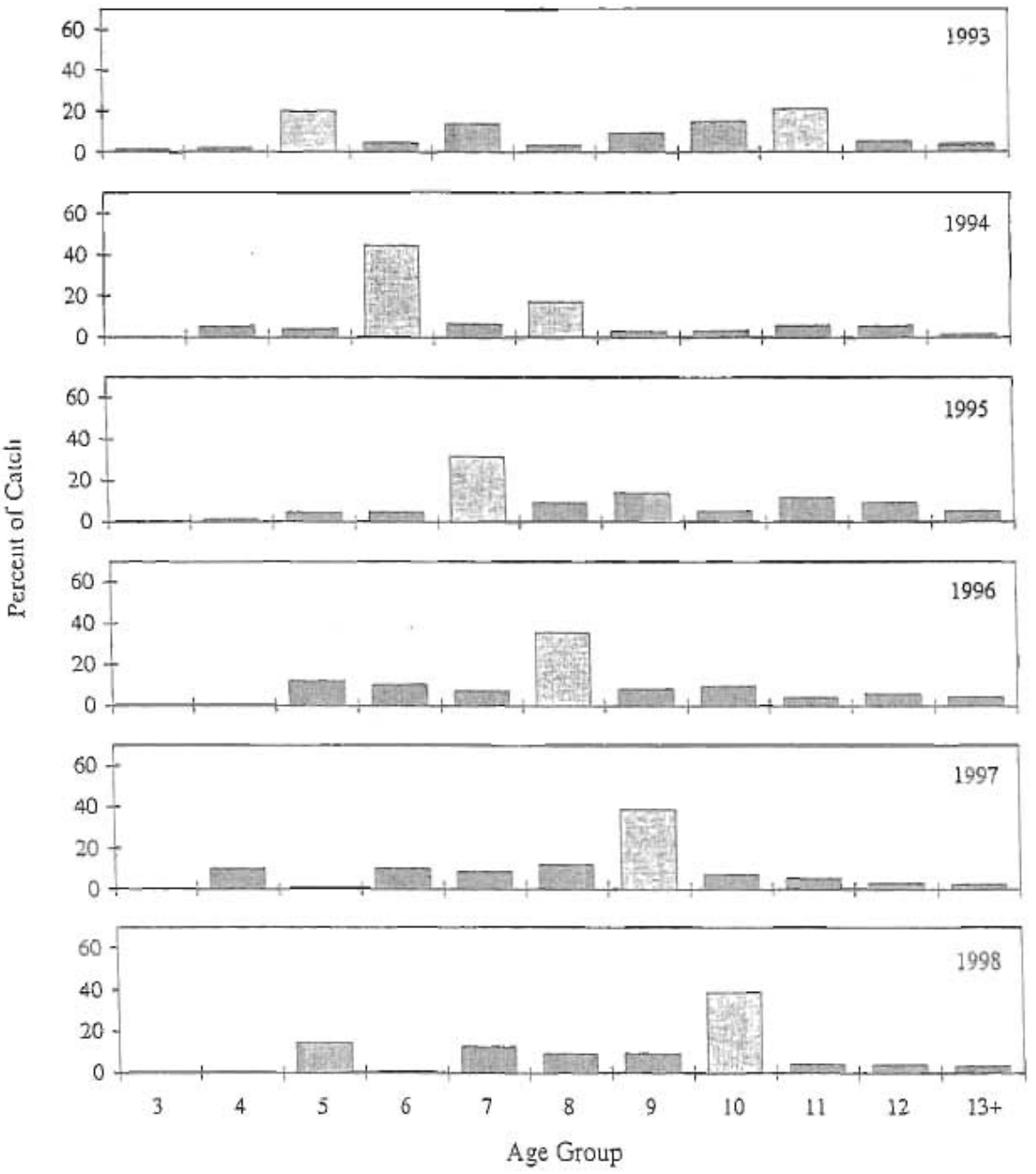


Figure 9. (page 3 of 4)

Norton Sound District

Age Composition of Variable Mesh Gillnets Catch

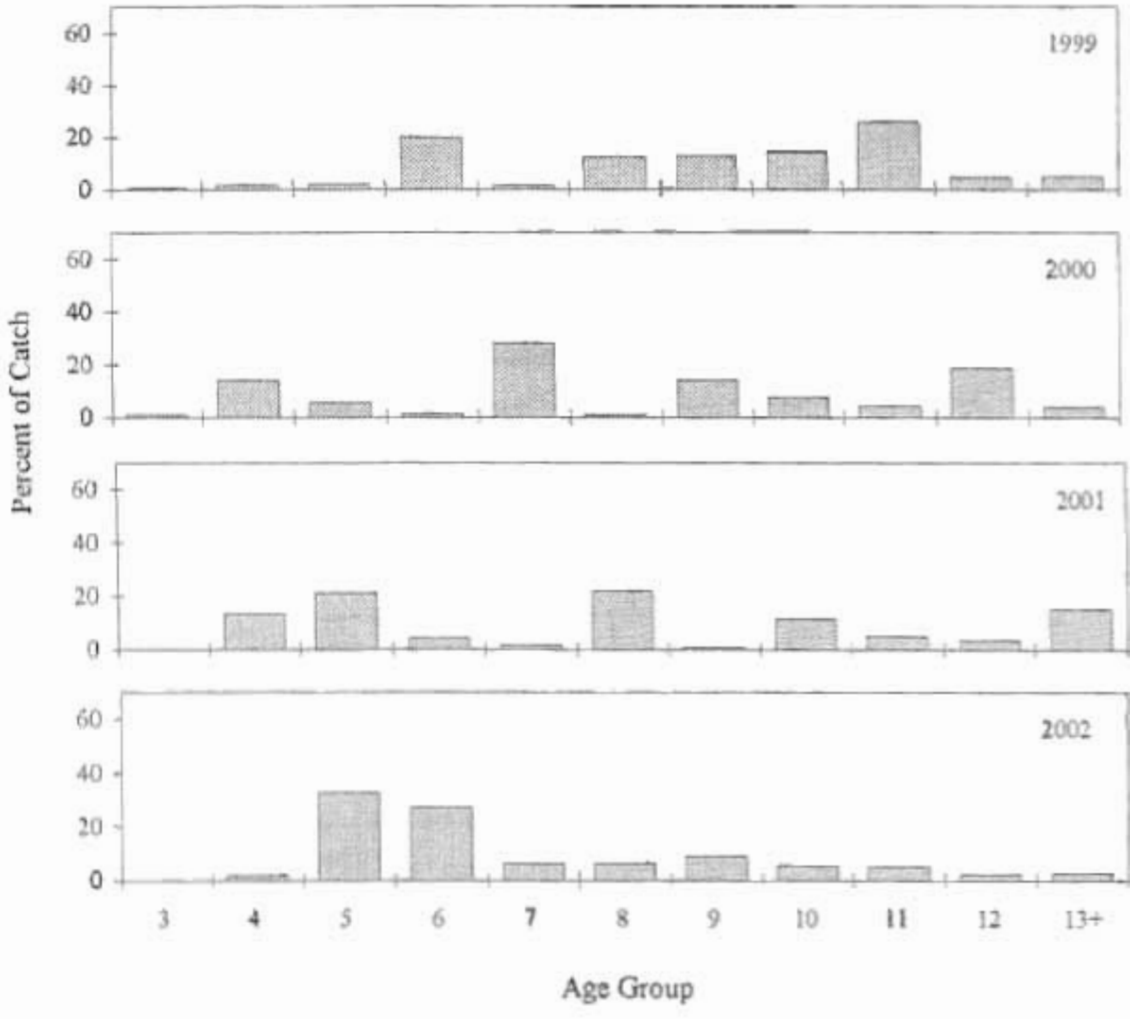


Figure 9. (page 4 of 4)

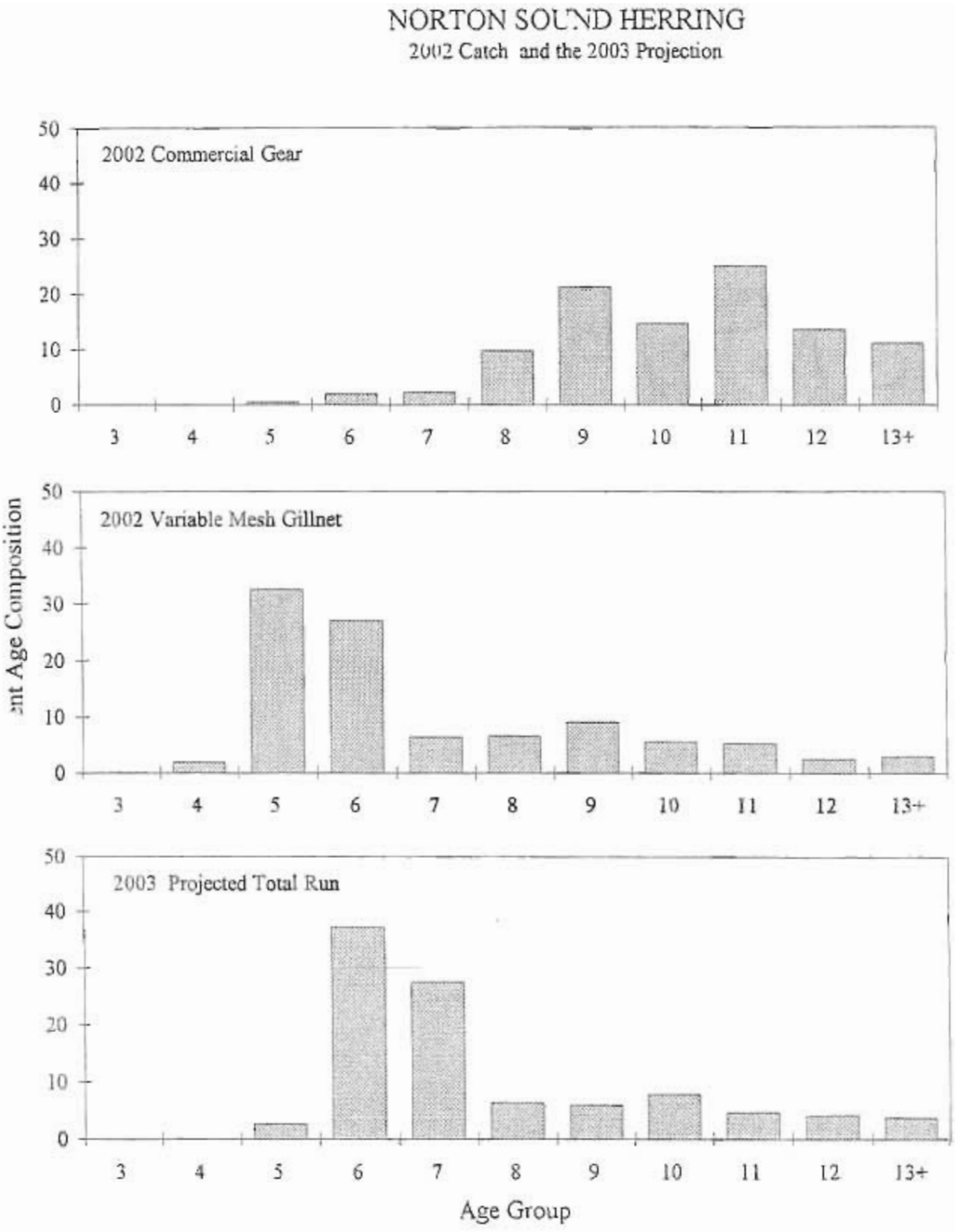


Figure 10. Norton Sound Pacific herring age composition comparison of the 2002 commercial gillnet gear, variable mesh gear, and the projected age composition of the 2003 run.

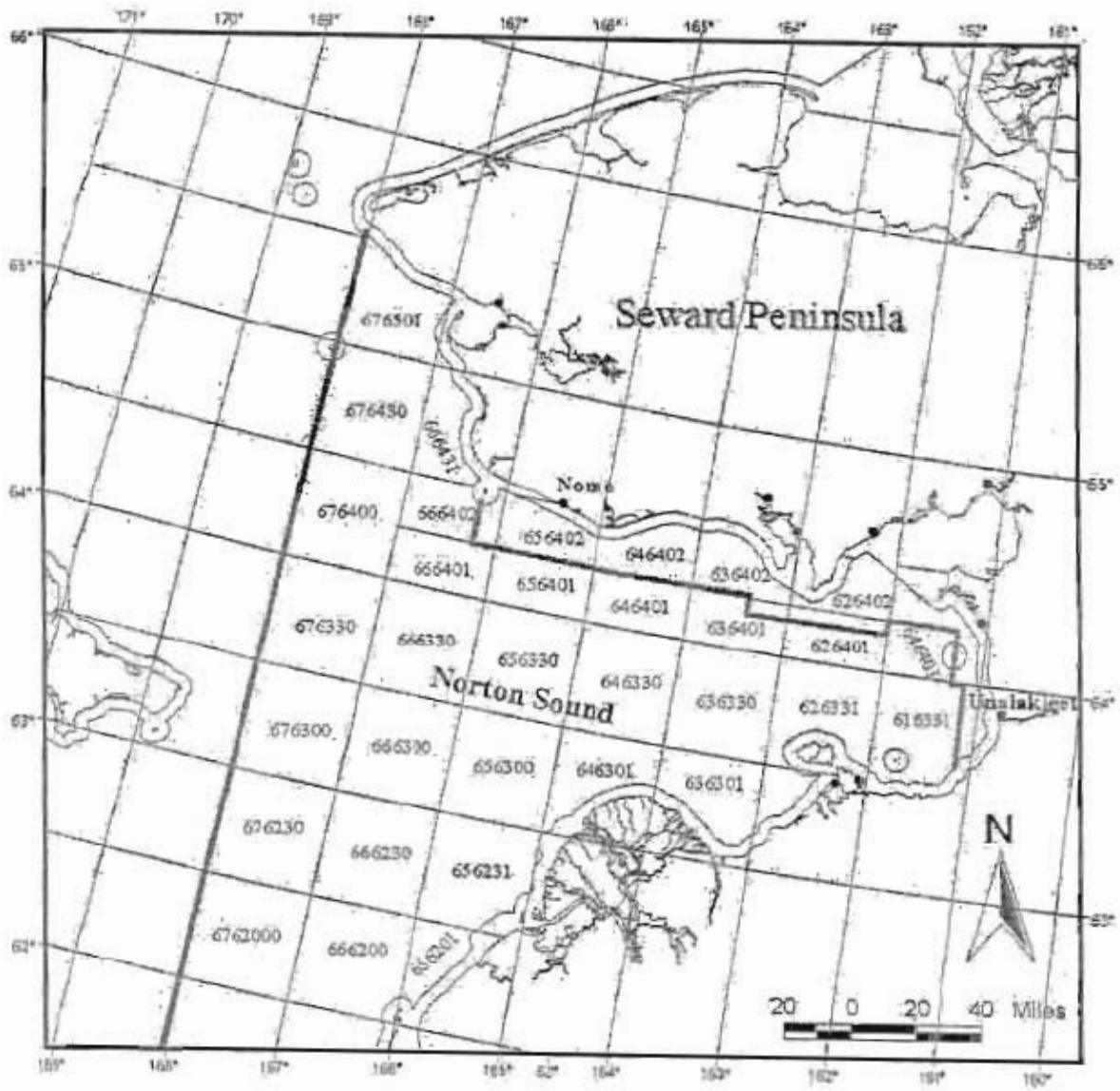


Figure 11. Statistical areas for the Norton Sound red king crab fishery.

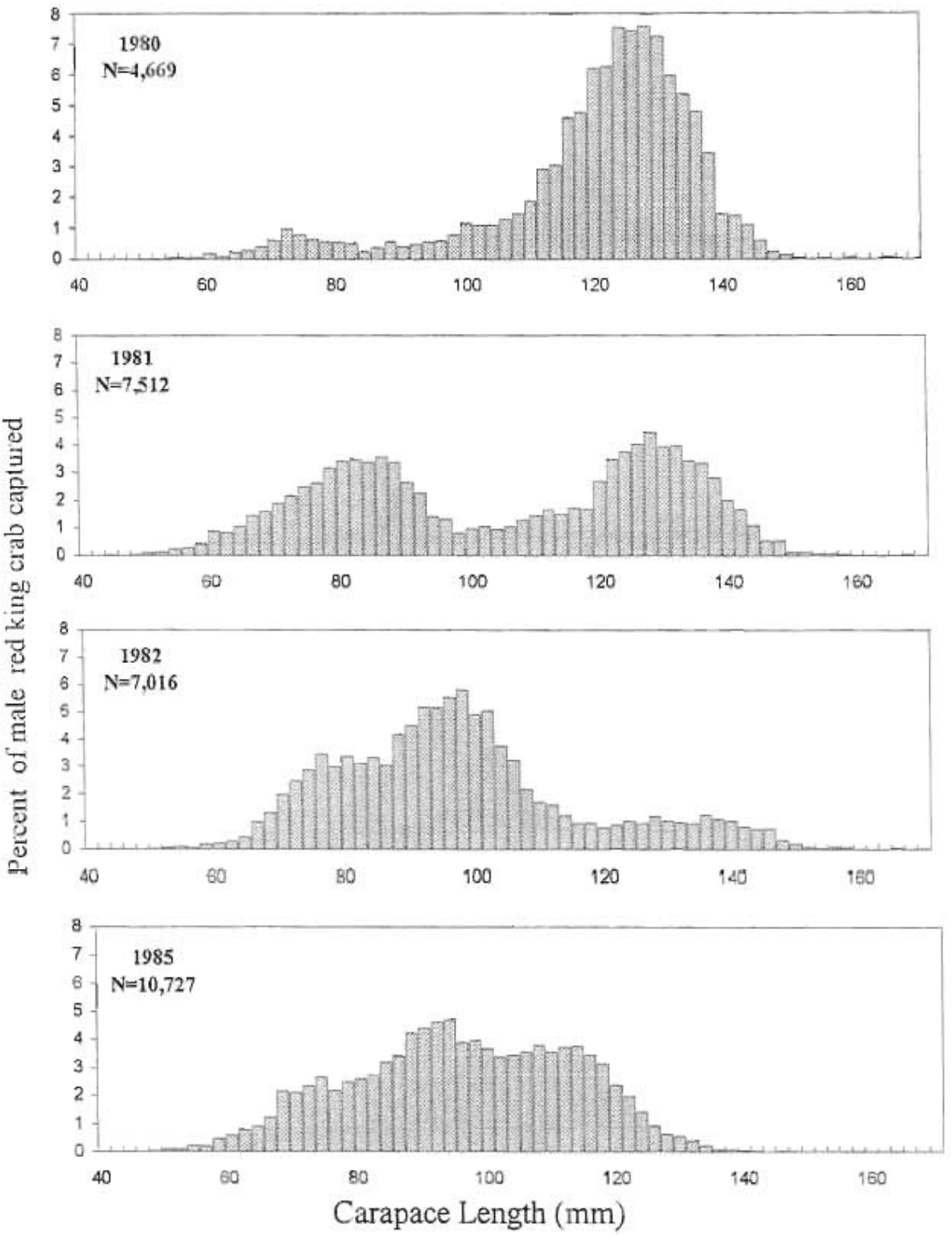


Figure 12. Norton Sound male red king crab size distribution from pot assessment surveys conducted by the Alaska Department of Fish and Game, 1980, 1981, 1982, and 1985.

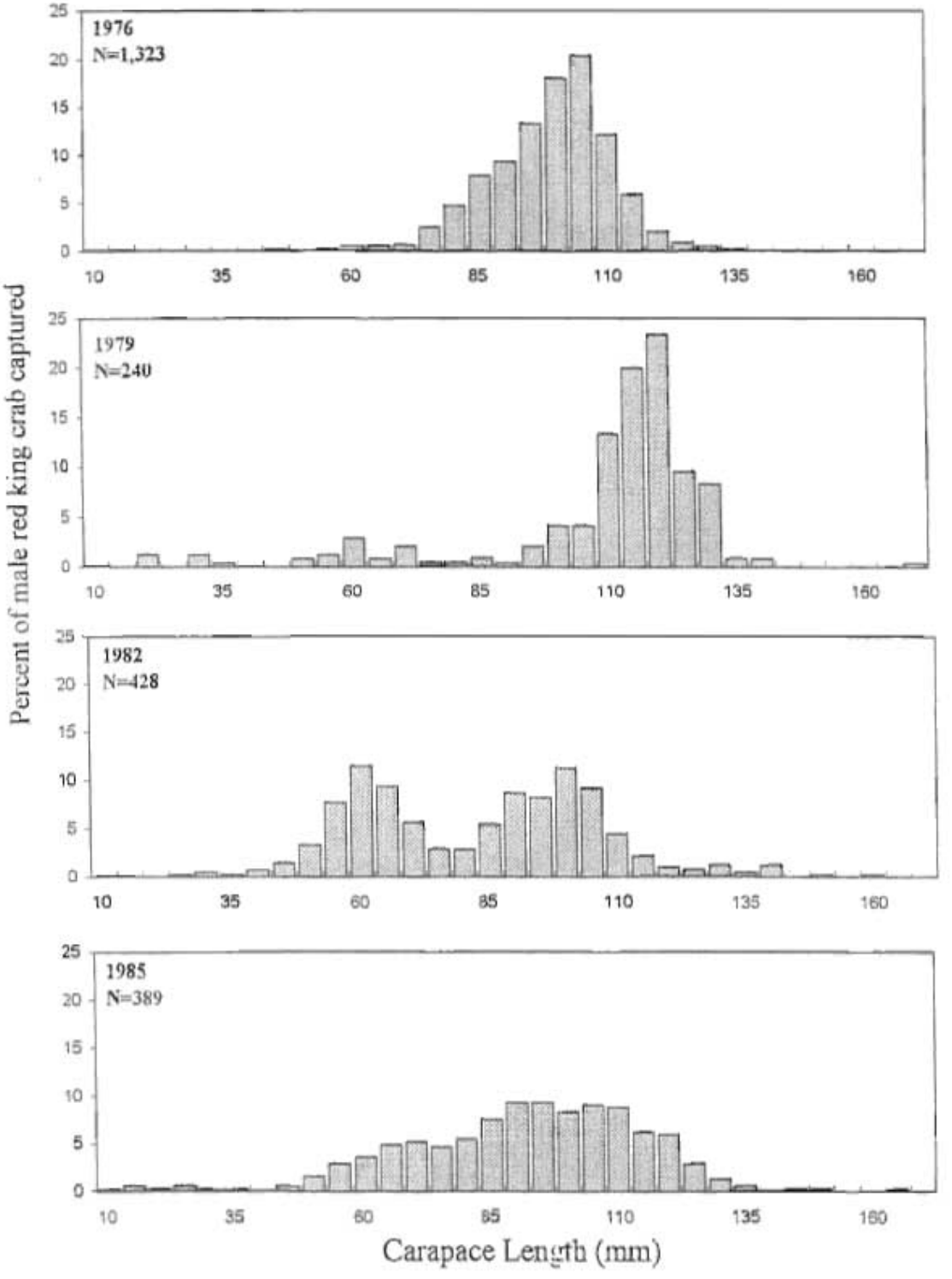


Figure 13. Norton Sound male red king crab size distribution from trawl assessment surveys conducted by the National Marine Fisheries Service, 1976, 1979, 1982, 1985, 1988, 1991, and by ADF&G in 1996, 1999. and 2002 (Page 1 of 3).

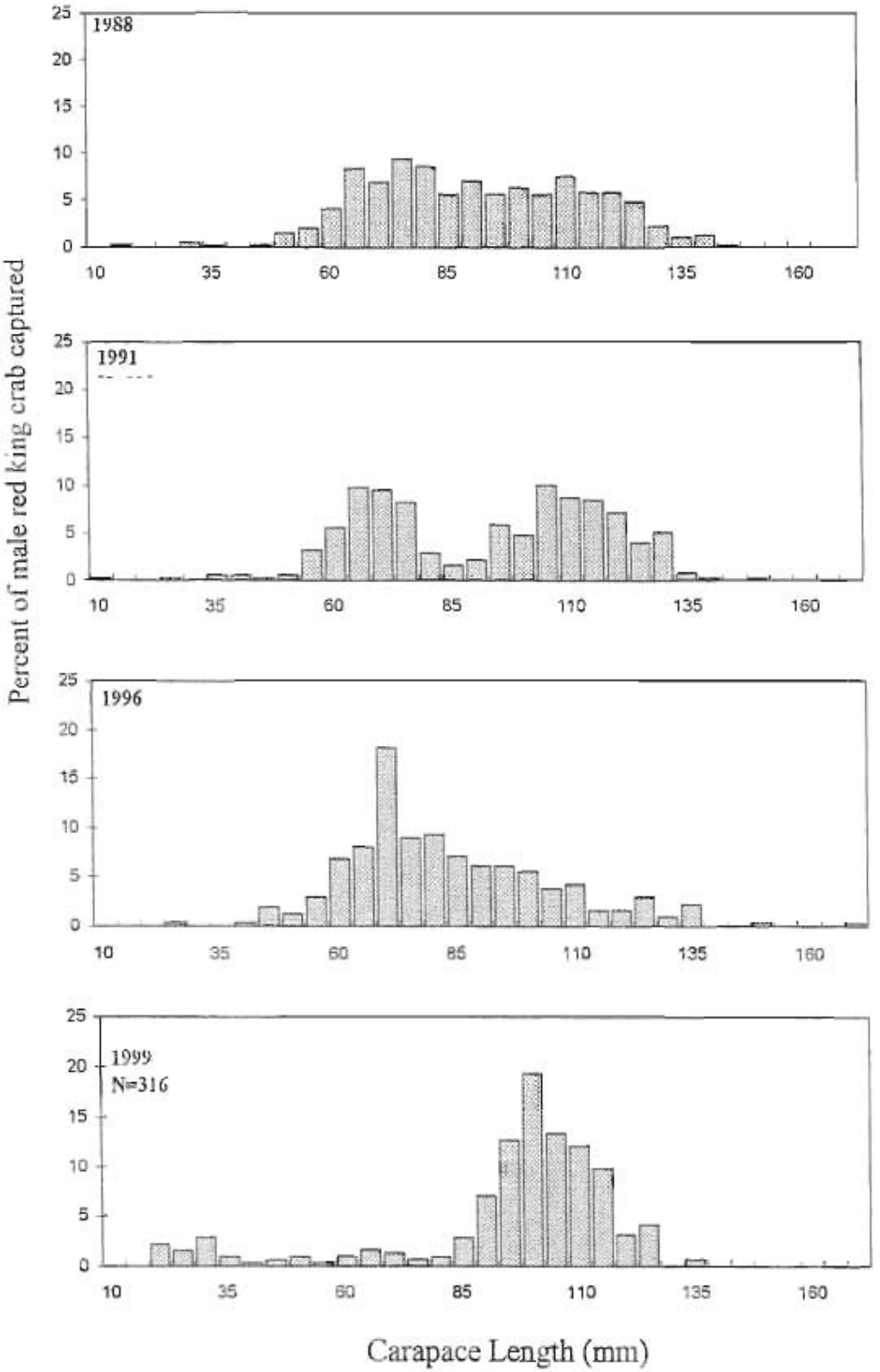


Figure 13. (Page 2 of 3)

Norton Sound Red King Crab

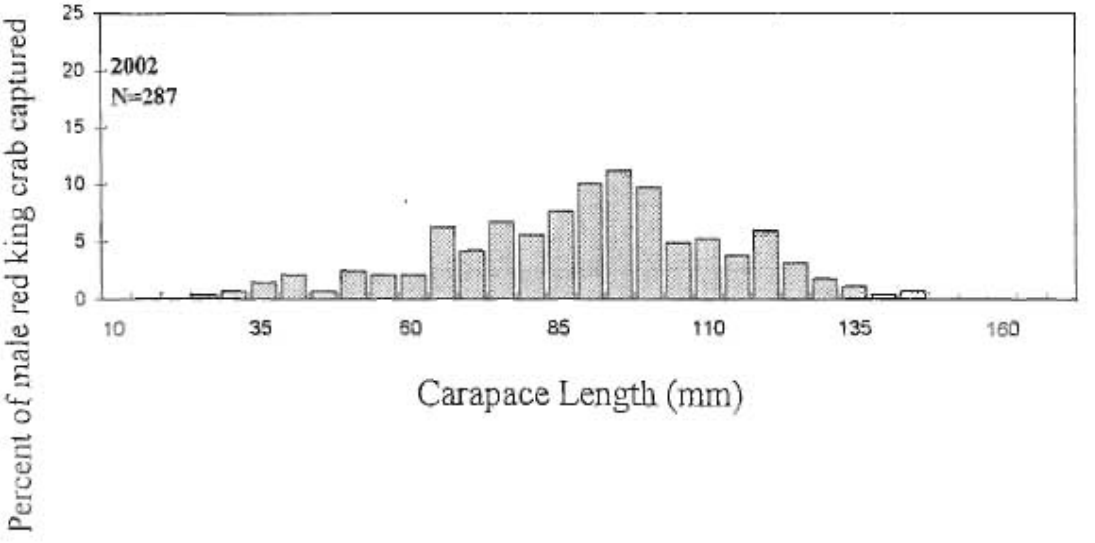


Figure 13. (Page 3 of 3)

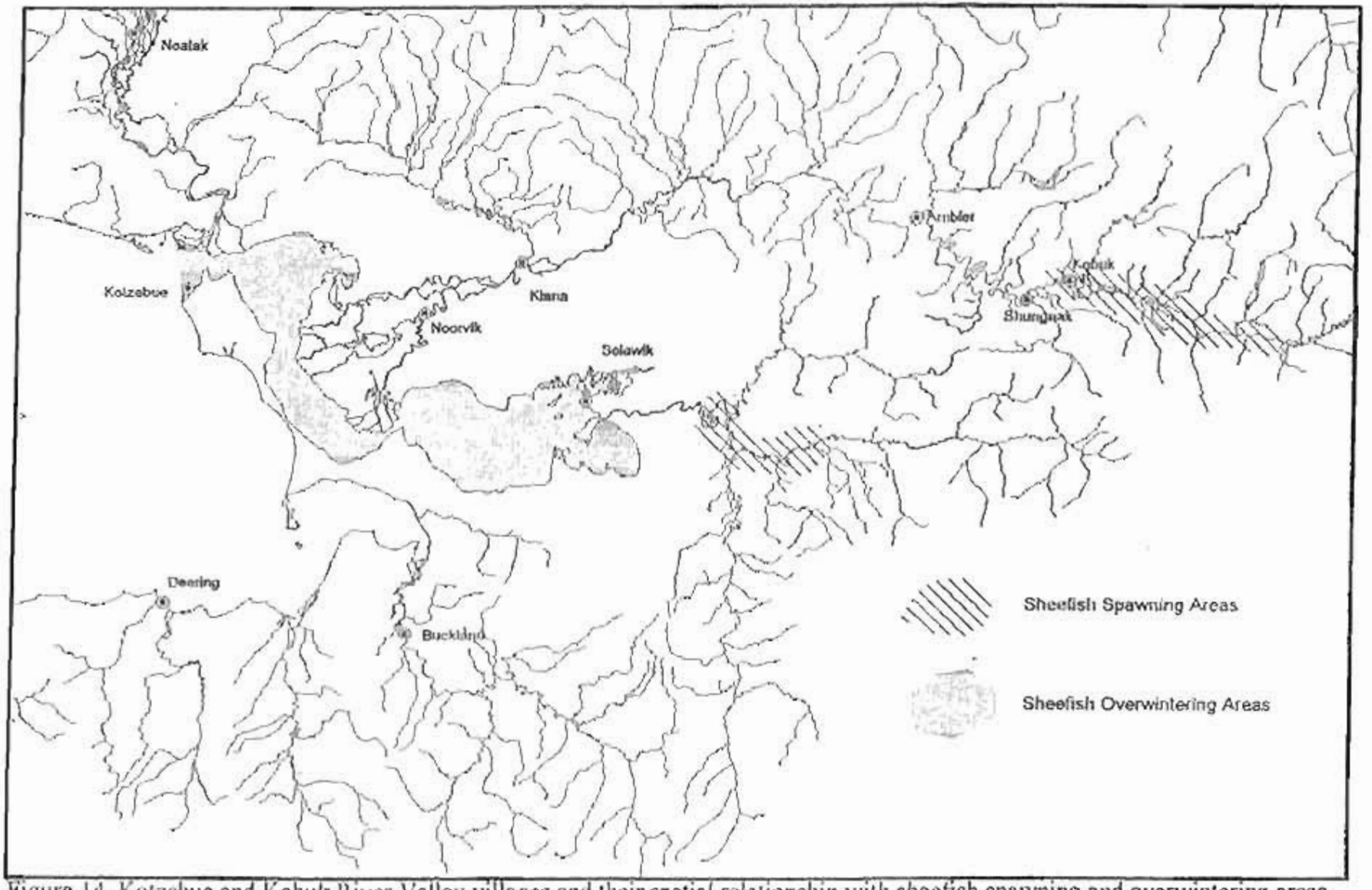


Figure 14. Kotzebue and Kobuk River Valley villages and their spatial relationship with sheefish spawning and overwintering areas.

Appendix Table A1. Number of commercial salmon permits fished, Norton Sound, 1970-2002.

Year	SUBDISTRICT 1	2	3	4	5	6	District [a] Total
1970	6	33	21	0	12	45	[b]
1971	7	22	45	6	19	72	[b]
1972	20	20	48	32	20	71	[b]
1973	21	34	57	30	27	94	[b]
1974	25	25	60	8	23	53	[b]
1975	24	42	67	42	39	61	[b]
1976	21	22	54	27	37	60	[b]
1977	14	25	52	24	30	45	164
1978	16	24	44	26	26	51	176
1979	15	21	41	22	29	63	175
1980	14	17	26	13	26	66	159
1981	15	19	33	10	26	73	167
1982	18	17	28	10	32	68	164
1983	19	21	39	15	34	72	170
1984	8	22	25	8	24	74	141
1985	9	21	34	12	21	64	155
1986	13	24	34	9	30	73	163
1987	10	21	34	12	39	65	164
1988	5	21	36	13	21	69	152
1989	2	0	13	0	26	73	110
1990	0	15	23	0	28	73	128
1991	0	16	24	0	25	75	126
1992	2	1	21	9	25	71	110
1993	1	8	26	15	37	66	153
1994	1	5	21	0	39	71	119
1995	2	7	12	0	26	58	105
1996	1	4	12	0	20	54	86
1997	0	11	21	9	19	57	102
1998	0	16	23	0	28	52	82
1999	0	0	0	0	15	45	60
2000	0	12	13	0	26	49	79
2001	0	5	5	0	13	29	51
2002	0	0	0	0	7	5	12

[a] District total is the number of fishers that actually fished in Norton Sound; some fishers may have fished more than one subdistrict.

[b] Data not available

Appendix Table A2. Commercial and subsistence salmon catches by species, by year in Nome Subdistrict, Norton Sound District, 1964-2002.

NOME (SUBDISTRICT 1)

Year	Commercial						Subsistence *						Combined					
	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1964	5	-	-	1	1,194	1,200	-	-	-	-	-	-	5	-	-	1	1,194	1,200
1965	1	-	-	193	1,941	2,135	-	-	-	780	1,825	2,605	1	-	-	973	3,766	4,740
1966	1	-	32	1	581	615	12	-	-	1,784	1,762	3,568	13	-	32	1,785	2,343	4,183
1967	-	-	-	72	406	478	11	-	-	348	627	987	11	-	-	421	1,033	1,465
1968	-	-	-	50	102	152	7	-	-	6,507	621	7,135	7	-	-	6,557	723	7,287
1969	-	-	63	330	601	994	2	-	-	3,649	508	4,159	2	-	63	3,979	1,109	5,153
1970	-	-	6	55	960	1,021	-	-	35	5,001	458	5,494	0	-	41	5,056	1,418	6,515
1971	11	-	-	14	2,315	2,340	-	-	122	5,457	2,900	8,479	11	-	122	5,471	5,215	10,819
1972	15	-	-	12	2,643	2,670	19	-	52	4,684	315	5,070	34	-	52	4,696	2,958	7,740
1973	-	-	-	321	1,132	1,453	14	-	120	5,108	1,863	7,105	14	-	120	5,429	2,995	8,558
1974	19	-	123	7,722	10,431	18,295	8	-	5	3,818	183	4,014	27	-	128	11,540	10,614	22,309
1975	2	-	319	2,169	8,364	10,848	2	-	97	6,267	2,858	9,224	4	-	416	8,436	11,222	20,072
1976	2	10	26	1,331	7,620	8,989	13	-	189	5,482	1,705	7,389	15	10	215	6,823	9,325	16,388
1977	8	-	58	65	15,998	16,129	35	-	498	2,773	12,192	15,498	43	-	556	2,838	28,190	31,627
1978	19	-	-	22,869	8,782	31,670	35	-	225	13,063	4,295	17,618	54	-	225	35,932	13,077	49,288
1979	9	-	29	5,860	5,391	11,289	11	-	1,120	6,353	3,273	10,757	20	-	1,149	12,213	8,664	22,046
1980	8	-	-	10,007	13,822	23,837	129	-	2,157	22,246	5,983	30,515	137	-	2,157	32,253	19,905	54,452
1981	4	-	508	3,202	18,666	22,380	35	14	1,726	5,584	8,579	15,938	39	14	2,234	8,786	27,245	38,318
1982	20	-	1,183	18,512	13,447	33,162	21	6	1,829	19,202	4,831	25,889	41	6	3,012	37,714	18,278	59,051
1983	23	-	261	308	11,691	12,283	74	53	1,911	8,086	7,091	17,215	97	53	2,172	8,394	18,782	29,498
1984	7	-	620	-	3,744	4,571	83	16	1,795	17,182	4,883	23,959	90	16	2,615	17,182	8,627	28,530
1985	21	-	356	-	6,219	6,596	56	114	1,054	2,117	5,667	9,008	77	114	1,410	2,117	11,886	15,604

-Continued-

Appendix Table A2. Commercial and subsistence salmon catches by species, by year in Nome Subdistrict, Norton Sound District, 1964-2002.

NOME (SUBDISTRICT 1)

	Commercial						Subsistence [a]						Combined					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1966	6	-	50	-	6,160	6,216	150	197	688	8,720	8,085	17,759	156	197	738	8,720	16,245	25,966
1967	3	-	577	-	5,046	6,226	200	107	1,100	1,251	8,394	11,052	203	107	1,677	1,251	14,040	17,278
1968	2	-	54	182	1,628	1,866	63	133	1,078	2,159	5,952	9,383	65	133	1,130	2,341	7,580	11,249
1969	2	0	0	123	492	617	24	131	469	924	3,399	4,947	26	131	469	1,047	3,891	5,564
1970	0	0	0	0	0	0	58	234	510	2,233	4,246	7,281	58	234	510	2,233	4,246	7,281
1971	0	0	0	0	0	0	83	166	1,279	194	3,715	5,437	83	166	1,279	194	3,715	5,437
1972	1	2	693	185	881	1,762	152	163	1,481	7,351	1,684	10,831	153	165	2,174	7,536	2,565	12,593
1973	0	2	611	0	132	745	52	80	2,070	873	1,766	4,841	52	82	2,681	873	1,898	5,586
1974	0	1	287	0	66	354	23	69	983	6,556	1,673	9,304	23	70	1,270	6,556	1,739	9,658
1975	0	1	369	0	122	492	36	211	1,897	486	5,344	7,974	36	212	2,266	486	5,466	8,466
1976	0	0	9	13	3	25	19	353	1,317	5,802	4,333	11,824	19	353	1,326	5,815	4,336	11,849
1977	0	0	0	0	0	0	19	99	534	287	4,996	5,936	19	99	534	287	4,996	5,936
1978	0	0	0	0	0	0	15	14	1,057	4,797	964	6,847	15	14	1,057	4,797	964	6,847
1979	0	0	0	0	0	0	11	85	161	58	337	652	11	85	161	58	337	652
2000	0	0	0	0	0	0	7	26	747	2,657	535	3,972	7	26	747	2,657	535	3,972
2001	0	0	0	0	0	0	2	92	425	113	858	1,490	2	92	425	113	858	1,490
2002	0	0	0	0	0	0	4	79	666	3,161	1114	5,024	4	79	666	3,161	1,114	5,024
5-year avg. [b]	0	0	0	0	0	0	11	63	585	1,582	1,536	3,779	11	63	585	1,582	1,538	3,779
10-year avg. [c]	0	1	197	20	120	338	34	119	1,097	2,898	2,249	6,397	34	120	1,264	2,918	2,369	6,705

[a] Subsistence harvest are incomplete prior to 1979.

[b] 1997-2001

[c] 1992-2001

Appendix Table A3. Commercial and subsistence salmon catches by species, by year in Golovin Subdistrict, Norton Sound District, 1962-2002.

GOLOVIN (SUBDISTRICT 2)

	Commercial						Subsistence						Combined					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1962	45	11	264	10,276	68,720	79,316	-	-	-	-	-	-	45	11	264	10,276	68,720	79,316
1963	40	40	-	19,677	49,650	69,807	-	-	118	5,702	9,319	15,139	40	40	118	25,379	59,169	84,746
1964	27	40	3	7,236	58,301	65,607	-	-	-	-	-	-	27	40	3	7,236	58,301	65,607
1965	-	-	-	-	-	-	2	-	49	1,523	3,847	5,421	2	-	49	1,523	3,847	5,421
1966	17	14	584	4,665	29,791	35,071	4	-	176	1,573	3,520	5,273	21	14	760	6,238	33,311	40,344
1967	10	-	747	5,790	31,193	37,740	3	-	185	2,774	4,803	7,765	13	-	932	8,564	35,996	45,505
1968	12	-	205	18,428	10,011	28,656	4	-	181	4,955	1,744	6,884	16	-	386	23,383	11,755	35,540
1969	28	-	1,224	23,208	20,949	45,409	2	-	190	2,760	2,514	5,466	30	-	1,414	25,968	23,463	50,875
1970	13	-	3	18,721	20,566	39,303	4	-	353	2,046	2,614	5,017	17	-	356	20,767	23,180	44,320
1971	37	-	197	2,735	33,824	36,793	7	-	191	1,544	1,936	3,678	44	-	388	4,279	35,760	40,471
1972	36	-	20	6,562	27,097	33,715	4	-	62	1,735	2,028	3,829	40	-	82	8,297	29,125	37,544
1973	70	-	183	14,145	41,689	56,087	1	-	48	9	74	132	71	-	231	14,154	41,763	56,219
1974	30	-	3	28,340	30,173	58,546	3	-	-	967	205	1,175	33	-	3	29,307	30,378	59,721
1975	17	-	206	10,770	41,761	52,754	-	-	1	2,011	2,025	4,037	17	-	207	12,781	43,786	56,791
1976	12	-	1,311	24,051	30,219	55,593	-	-	-	1,995	1,128	3,123	12	-	1,311	26,046	31,347	58,716
1977	26	-	426	7,928	53,912	62,292	3	-	80	703	2,915	3,701	29	-	506	8,631	56,827	65,993
1978	22	-	94	72,033	41,462	113,611	1	-	-	2,478	1,061	3,532	23	-	94	74,503	42,523	117,143
1979	75	49	1,606	45,948	30,201	77,879	-	-	845	2,546	2,840	6,231	75	49	2,451	48,494	33,041	84,110
1980	36	36	328	10,774	52,909	63,783	12	-	692	10,727	4,057	15,488	48	36	1,020	21,501	56,666	79,271
1981	23	5	13	49,755	58,323	108,119	8	-	1,520	5,158	5,543	12,229	31	5	1,533	54,913	63,866	120,348
1982	78	5	4,281	39,519	51,970	95,844	7	-	1,289	4,752	1,868	7,916	85	5	5,570	44,262	53,838	103,760
1983	52	10	295	17,414	48,283	66,054	-	-	-	-	-	- [c]	-	-	-	-	-	-
1984	31	-	2,462	88,588	54,153	145,234	-	-	-	-	-	- [c]	-	-	-	-	-	-
1985	193	113	1,196	3,013	55,781	60,302	12	2	430	1,904	9,577	11,925 [c]	205	115	1,626	4,923	65,358	72,227

-Continued-

GOLOVIN (SUBDISTRICT 2)

Year	Commercial						Subsistence						Combined					
	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1986	81	8	956	25,425	69,725	96,197	-	-	-	-	-	- [a]	-	-	-	-	-	-
1987	166	51	2,203	1,579	44,334	48,333	-	-	-	-	-	- [a]	-	-	-	-	-	-
1988	108	921	2,149	31,559	33,348	68,085	-	-	-	-	-	- [a]	-	-	-	-	-	-
1989	0	0	0	0	0	0	-	-	-	-	-	- [a]	-	-	-	-	-	-
1990	52	21	0	0	15,993	16,066	-	-	-	-	-	- [a]	-	-	-	-	-	-
1991	49	1	0	0	14,839	14,889	-	-	-	-	-	- [a]	-	-	-	-	-	-
1992	6	9	2,085	0	1,002	3,102	-	-	-	-	-	- [a]	-	-	-	-	-	-
1993	1	4	2	8,480	2,803	11,290	-	-	-	-	-	- [a]	-	-	-	-	-	-
1994	0	0	3,424	0	111	3,535	253	168	733	8,410	1,337	10,901 [a]	253	168	4,157	8,410	1,448	14,436
1995	0	0	1,616	4,296	1,987	7,899	165	34	1,649	7,816	10,373	20,039 [a]	165	34	3,265	12,114	12,360	27,938
1996	0	0	638	0	0	638	86	134	3,014	17,399	2,867	23,500 [d]	86	134	3,652	17,399	2,867	24,138
1997	19	2	102	29	8,003	8,146	138	427	555	4,570	4,891	10,581 [a]	157	429	657	4,599	12,894	18,727
1998	1	0	3	106,761	723	107,488	184	37	1,292	13,340	1,893	16,747 [a]	185	37	1,295	120,101	2,616	124,235
1999	0	0	0	0	0	0	60	48	1,234	469	3,656	5,467 [a]	60	48	1,234	469	3,656	5,467
2000	0	0	1,645	17,408	164	19,217	169	18	2,335	10,906	1,155	14,583 [a]	169	18	3,980	28,314	1,319	33,800
2001	0	43	30	0	7094	7,167	89	72	850	1,665	3,291	5,997 [a]	89	115	910	1,665	10,385	13,164
2002	0	0	0	0	0	0	69	66	1,640	14,430	1,882	18,087 [a]	69	66	1,640	14,430	1,882	18,087
5-year avg. [a]	4	9	356	24,838	3,197	28,404	128	120	1,259	6,190	2,977	10,675	132	129	1,615	31,028	6,174	39,079
10-year avg. [b]	3	6	955	13,697	2,189	16,848												

[a] 1997-2001

[b] 1992-2001

[c] Subsistence survey not conducted.

[d] Harvest estimated from Div. of Subsistence survey.

Appendix Table A4. Commercial and subsistence salmon catches by species, by year in Moses Point Subdistrict, Norton Sound District, 1962-2002

MOSES POINT (SUBDISTRICT 3)

	Commercial						Subsistence						Combined					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1962	27	-	-	11,100	50,683	61,810	-	-	-	-	-	-	27	-	-	11,100	50,683	61,810
1963	15	-	-	2,549	46,274	48,838	5	-	-	5,808	8,316	14,129	20	-	-	8,357	54,590	62,967
1964	32	3	-	3,372	28,568	31,975	-	-	-	63	348	411	32	3	0	3,435	28,916	32,386
1965	-	-	-	-	-	-	16	-	72	1,325	9,857	11,270	16	-	72	1,325	9,857	11,270
1966	17	-	-	2,745	24,741	27,503	14	-	250	2,511	5,409	8,184	31	0	250	5,256	30,150	35,687
1967	-	-	-	-	-	-	39	-	116	1,322	9,913	11,390	39	-	116	1,322	9,913	11,390
1968	12	-	1	9,012	17,908	26,933	2	-	80	6,135	2,527	8,744	14	-	81	15,147	20,435	35,677
1969	29	-	-	11,807	26,594	38,430	9	-	109	1,790	1,303	3,211	38	-	109	13,597	27,897	41,641
1970	39	-	-	13,052	28,726	42,817	16	-	160	4,661	6,960	11,797	55	-	160	17,713	36,686	54,614
1971	95	-	4	922	43,831	44,852	16	-	271	1,046	2,227	3,560	111	-	275	1,968	46,058	48,412
1972	190	-	11	5,866	30,919	36,986	44	-	108	1,579	2,070	3,801	234	-	119	7,445	32,989	40,787
1973	134	-	-	10,603	31,389	42,126	2	-	-		298	300	136	-	-	10,603	31,687	42,426
1974	198	-	9	12,821	55,276	68,304	3	-	-	2,382	1,723	4,108	201	-	9	15,203	56,999	72,412
1975	16	-	-	4,407	46,699	51,122	2	-	6	1,280	508	1,796	18	-	6	5,687	47,207	52,918
1976	24	-	232	5,072	10,890	16,218	22	-	-	5,016	1,548	6,586	46	-	232	10,088	12,438	22,804
1977	96	-	6	9,443	47,455	57,000	22	-	225	1,145	1,170	2,562	118	-	231	10,588	48,625	59,562
1978	444	-	244	39,694	44,595	84,977	38	-	407	1,985	1,229	3,669	482	-	651	41,689	45,824	88,646
1979	1,035	-	177	40,811	37,123	79,146	16	-	890	6,078	1,195	8,179	1,051	-	1,067	46,889	38,318	87,325
1980	502	-	-	1,435	14,755	16,692	131	-	229	4,232	1,393	5,985	633	-	229	5,667	16,148	22,677
1981	198	-	5	26,417	29,325	55,945	32	-	2,345	6,530	2,819	11,726	230	-	2,350	32,947	32,144	67,671
1982	253	-	318	9,649	40,030	50,450	1	-	1,835	3,785	3,537	9,158	254	-	2,153	13,434	43,567	59,608
1983	254	-	-	17,027	65,776	83,057	-	-	-	-	-	- [4]	-	-	-	-	-	-
1984	-	-	5,959	28,035	9,477	43,471	-	-	-	-	-	- [4]	-	-	-	-	-	-
1985	816	32	1,803	559	24,466	27,676	67	-	1,389	1,212	947	3,615 [4]	883	32	3,192	1,771	25,413	31,291

-Continued-

Appendix Table A4. Commercial and subsistence salmon catches by species, by year in Moses Point Subdistrict, Norton Sound District, 1962-2002.

MOSES POINT (SUBDISTRICT 3)

Year	Commercial						Subsistence						Combined					
	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1986	600	41	5,874	15,795	20,668	42,978	-	-	-	-	-	- [1]	-	-	-	-	-	-
1987	907	15	64	568	17,278	18,832	-	-	-	-	-	- [1]	-	-	-	-	-	-
1988	663	93	3,974	13,703	18,585	37,018	-	-	-	-	-	- [1]	-	-	-	-	-	-
1989	62	0	0	0	167	229	-	-	-	-	-	- [1]	-	-	-	-	-	-
1990	202	0	0	501	3,723	4,426	-	-	-	-	-	- [1]	-	-	-	-	-	-
1991	161	0	0	0	804	965	312	-	2,153	3,555	2,660	8,680 [4]	473	-	2,153	3,555	3,464	9,645
1992	0	0	3,531	0	6	3,537	100	-	1,281	6,152	1,260	8,793 [4]	100	-	4,812	6,152	1,266	12,330
1993	3	0	4,065	0	167	4,235	368	-	1,217	1,726	1,635	4,946 [4]	371	-	5,282	1,726	1,802	9,181
1994	0	0	5,345	0	414	5,759	322	104	1,180	9,345	3,476	14,427 [4]	322	104	6,525	9,345	3,890	20,186
1995	4	44	3,742	2,962	1,171	7,923	284	17	1,353	2,046	3,774	7,474 [4]	288	61	5,095	5,008	4,945	15,397
1996	0	0	1,915	68,509	0	70,524	417	52	1,720	9,442	2,319	13,951 [4]	417	52	3,635	78,051	2,319	84,475
1997	844	0	1,409	0	2,683	4,936	619	50	1,213	1,314	2,064	5,261 [4]	1,463	50	2,622	1,314	4,747	10,197
1998	105	0	1,462	145,869	2,311	149,547	414	49	1,631	6,891	1,376	10,561 [4]	519	49	3,293	152,560	3,687	160,108
1999	0	0	0	0	0	0	424	13	975	1,564	744	3,720 [4]	424	13	975	1,564	744	3,720
2000	10	0	5,182	46,369	535	52,096	248	46	1,429	5,983	1,173	8,879 [4]	258	46	6,611	52,352	1,708	60,975
2001	7	0	1,696	0	681	2,384	427	70	1,352	1,390	898	4,137 [4]	434	70	3,048	1,390	1,579	6,521
2002	0	0	0	0	0	0	565	14	1,801	8,345	1,451	12,176 [4]	565	14	1,801	8,345	1,451	12,176
5-year avg. [2]	193	0	1,950	38,408	1,242	41,793	429	46	1,369	3,478	1,251	6,512	620	46	3,319	41,836	2,493	48,304
10-year avg. [3]	97	4	2,835	26,361	797	30,094	362	50	1,355	4,585	1,872	8,215	460	56	4,190	30,946	2,669	38,309

[1] 1997-2001

[2] 1992-2001

[3] Subsistence survey not conducted.

[4] Harvest estimated from Div. of Subsistence survey.

Appendix Table A5. Commercial and subsistence salmon catches by species, by year in Norton Bay Subdistrict, Norton Sound District, 1962-2002.

NORTON BAY (SUBDISTRICT 4)

Year	Commercial						Subsistence						Combined					
	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1962	387	7	40	4,402	24,380	29,216	-	-	-	-	-	-	387	7	40	4,402	24,380	29,216
1963	137	2	-	17,676	12,469	30,284	-	-	-	5,097	-	5,097	137	2	-	22,773	12,469	35,381
1964	50	3	-	988	5,916	6,957	-	-	-	-	-	-	50	3	-	988	5,916	6,957
1965	-	-	-	-	-	-	4	-	22	252	3,032	3,310	4	-	22	252	3,032	3,310
1966	-	-	-	-	-	-	7	-	41	929	3,612	4,589	7	-	41	929	3,612	4,589
1967	-	-	-	-	-	-	12	-	14	1,097	2,945	4,068	12	-	14	1,097	2,945	4,068
1968	-	-	-	-	-	-	28	-	71	1,916	1,872	3,887	28	-	71	1,916	1,872	3,887
1969	26	-	-	4,649	3,974	8,649	59	-	189	2,115	3,855	6,218	85	-	189	6,964	7,829	15,067
1970	-	-	-	-		-	3	-	10	840	3,500	4,353	3	-	10	840	3,500	4,353
1971	-	-	-	-	-	-	5	-	47	92	2,619	2,763	5	-	47	92	2,619	2,763
1972	43	-	-	1,713	7,799	9,555	30	-	44	2,089	2,022	4,185	73	-	44	3,802	9,821	13,740
1973	28	-	-	1,645	4,672	6,345	1	-	-	10	130	141	29	-	-	1,655	4,802	6,486
1974	21	-	-	654	3,826	4,501	-	-	-	17	900	917	21	-	-	671	4,726	5,418
1975	68	-	89	1,137	17,385	18,679	1	-	-	93	361	455	69	-	89	1,230	17,746	19,134
1976	102	-	95	4,456	7,161	11,814	2	-	-	41	236	279	104	-	95	4,497	7,397	12,093
1977	158	-	1	2,495	13,563	16,217	14	-	-	420	2,055	2,489	172	-	1	2,915	15,618	18,706
1978	470	-	144	8,471	21,973	31,058	12	-	21	1,210	1,060	2,303	482	-	165	9,681	23,033	33,361
1979	856	-	2,547	6,701	15,599	25,703	12	-	697	735	1,400	2,844	868	-	3,244	6,936	16,999	28,047
1980	340	-	-	47	7,855	8,242	22	-	33	4,275	1,132	5,462	362	-	33	4,322	8,987	13,704
1981	63	-	-	177	3,111	3,351	7	-	82	2,314	3,515	5,918	70	-	82	2,491	6,626	9,269
1982	96	-	2,332	2,535	7,128	12,091	1	-	484	2,600	2,485	5,570	97	-	2,816	5,135	9,613	17,661
1983	215	-	204	3,935	17,157	21,511	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	1,162	3,442	4,604	-	-	-	-	-	-	-	-	-	-	-	-
1985	528	-	384	68	9,848	10,928	-	-	-	-	-	-	-	-	-	-	-	-

-Continued-

Appendix Table A5 Commercial and subsistence salmon catches by species, by year in Norton Bay Subdistrict, Norton Sound District, 1962-2002. (Page 2 of 2)

NORTON BAY (SUBDISTRICT 4)

Year	Commercial						Subsistence						Combined					
	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1986	139	2	1,512	40	1,994	3,687	-	-	-	-	-	- [c]	-	-	-	-	-	-
1987	544	-	145	16	3,586	4,291	-	-	-	-	-	- [c]	-	-	-	-	-	-
1988	434	2	709	1,749	7,521	10,415	-	-	-	-	-	- [c]	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	- [c]	-	-	-	-	-	-
1990 [a]	0	0	0	0	0	0	-	-	-	-	-	- [c]	-	-	-	-	-	-
1991 [a]	0	0	0	0	0	0	-	-	-	-	-	- [c]	-	-	-	-	-	-
1992	27	0	0	0	1,787	1,814	-	-	-	-	-	- [c]	-	-	-	-	-	-
1993	267	0	0	280	1,378	1,905	-	-	-	-	-	- [c]	-	-	-	-	-	-
1994 [a]	0	0	0	0	0	0	308	1	370	6,049	4,581	11,309 [e]	308	1	370	6,049	4,581	11,309
1995 [a]	0	0	0	0	0	0	475	46	985	3,514	5,828	10,848 [e]	475	46	985	3,514	5,828	10,848
1996 [a]	0	0	0	0	0	0	295	3	676	3,929	4,161	9,064 [e]	295	3	676	3,929	4,161	9,064
1997	194	0	0	0	531	725	656	54	322	1,795	4,040	6,777 [e]	850	54	322	1,795	4,571	7,502
1998 [a]	0	0	0	0	0	0	684	0	388	2,009	6,192	9,274 [e]	684	0	388	2,009	6,192	9,274
1999 [a]	0	0	0	0	0	0	327	0	167	1,943	4,153	6,590 [e]	327	0	167	1,943	4,153	6,590
2000 [a]	0	0	0	0	0	0	397	2	267	2,255	4,714	7,635 [e]	397	2	267	2,255	4,714	7,635
2001 [a]	0	0	0	0	0	0	460	14	276	5,203	4,445	10,397 [e]	460	14	276	5,203	4,445	10,397
2002 [a]	0	0	0	0	0	0	557	0	509	6,049	3,971	10,397 [e]	557	0	509	6,049	3,971	10,397
5-year avg. [e]	39	0	0	0	106	145	505	14	284	2,641	4,709	8,135	544	14	284	2,641	4,815	8,280
10-year avg. [b]	49	0	0	29	370	447	-	-	-	-	-	-	-	-	-	-	-	-

[e] 1997-2001

[b] 1992-2001

[a] Subsistence survey not conducted.

[c] No commercial harvest reported.

[e] Harvest estimated from Div. of Subsistence survey.

Appendix Table A6. Commercial and subsistence salmon catches by species, by year in Shaktoolik Subdistrict, Norton Sound District, 1961-2002.

SHAKTOOLIK (SUBDISTRICT 5)

Year	Commercial						Subsistence						Combined					
	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1961	140	-	-	29,075	24,746	53,961	-	-	-	-	-	-	140	-	-	29,075	24,746	53,961
1962	1,738	-	2,113	640	8,718	13,209	-	-	-	-	-	-	1,738	-	2,113	640	8,718	13,209
1963	480	11	563	5,138	19,153	25,345	-	-	-	-	-	-	480	11	563	5,138	19,153	25,345
1964	631	79	16	1,969	35,272	37,967	77	-	340	2,132	5,412	7,961	708	79	356	4,101	40,684	45,928
1965	127	30	-	3	8,356	8,516	31	-	107	3,763	3,429	7,321	158	30	107	3,766	11,776	15,837
1966	310	-	956	344	8,292	9,902	142	-	762	1,445	4,183	6,532	452	-	1,718	1,789	12,475	16,434
1967	43	-	88	1,050	1,655	2,836	262	-	387	2,010	4,436	7,095	305	-	475	3,060	6,091	9,931
1968	61	-	130	2,205	2,604	4,900	10	-	458	6,365	1,916	8,738	71	-	588	8,560	4,419	13,638
1969	33	-	276	6,197	8,645	15,151	40	-	193	4,018	3,439	7,690	73	-	469	10,215	12,084	22,841
1970	197	-	159	2,301	15,753	18,406	43	-	210	2,474	2,016	4,743	240	-	369	4,775	17,769	23,149
1971	284	-	238	28	13,399	13,949	87	-	329	494	5,060	5,970	371	-	567	522	18,459	19,919
1972	419	-	11	2,798	12,022	15,250	64	-	235	939	3,399	4,637	483	-	246	3,737	15,421	19,887
1973	289	-	177	6,460	14,500	21,416	51	-	130	3,410	1,397	4,988	340	-	307	9,860	15,897	26,404
1974	533	-	179	5,650	26,391	32,803	93	-	353	1,901	358	2,705	626	-	532	7,551	26,749	35,508
1975	651	2	812	1,774	49,536	52,775	18	-	14	1,394	334	1,760	669	2	826	3,168	49,870	54,535
1976	892	-	129	15,803	15,798	32,622	24	-	121	1,188	269	1,602	916	-	250	16,991	16,067	34,224
1977	1,521	4	418	7,743	36,591	46,277	49	-	170	585	2,190	2,994	1,570	4	588	8,328	38,781	49,271
1978	1,339	7	1,116	40,236	35,388	84,086	81	-	15	3,275	1,170	4,541	1,420	7	1,131	49,511	36,558	88,627
1979	2,377	-	3,353	18,944	22,030	46,734	62	-	1,605	2,575	1,670	5,912	2,439	-	4,988	21,519	23,700	52,646
1980	1,036	-	8,001	1,947	27,453	38,437	57	-	756	3,227	1,827	5,867	1,143	-	8,757	5,174	29,280	44,354
1981	1,484	4	1,191	29,695	21,097	53,471	8	-	525	2,225	3,490	6,248	1,492	4	1,716	31,920	24,587	59,719
1982	1,677	3	22,233	17,019	26,240	67,172	68	-	2,138	3,865	1,165	7,236	1,745	3	24,371	20,884	27,405	74,408
1983	2,742	4	12,877	12,031	67,310	94,964	-	-	-	-	-	-	- [5]	-	-	-	-	-
1984	1,613	-	10,730	1,596	32,309	48,248	-	-	-	-	-	-	- [5]	-	-	-	-	-
1985	5,312	-	2,808	-	13,403	21,523	298	-	1,379	24	298	1,999	5,610	-	4,187	24	13,701	23,522

-Continued-

Appendix Table A6. Commercial and subsistence salmon catches by species, by year in Shaktoolik Subdistrict, Norton Sound District, 1961-2002.

SHAKTOOLIK (SUBDISTRICT 5)

	Commercial						Subsistence						Combined					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1988	1,075	29	6,829	-	16,126	23,856	-	-	-	-	-	-	- [c]	-	-	-	-	-
1987	2,214	-	6,193	-	14,088	22,495	-	-	-	-	-	-	- [c]	-	-	-	-	-
1988	671	79	6,096	3,681	21,521	32,048	-	-	-	-	-	-	- [c]	-	-	-	-	-
1989	1,241	43	8,066	0	19,641	28,991	-	-	-	-	-	-	- [c]	-	-	-	-	-
1990	2,644	49	4,695	9	21,748	29,139	-	-	-	-	-	-	- [c]	-	-	-	-	-
1991	1,324	55	11,614	0	31,619	44,612	-	-	-	-	-	-	- [c]	-	-	-	-	-
1992	1,098	56	14,860	0	27,867	43,881	-	-	-	-	-	-	- [c]	-	-	-	-	-
1993	2,756	20	11,130	106,743	20,864	141,513	-	-	-	-	-	-	- [c]	-	-	-	-	-
1994	855	8	22,095	502,231	5,411	530,600	1,175	1	2,777	8,133	1,221	14,307 [d]	7,060	9	24,842	511,364	6,632	544,907
1995	1,239	5	10,856	37,377	14,775	64,252	1,275	2,480	2,626	7,024	2,480	15,885 [d]	2,514	2,485	13,482	44,401	17,255	80,137
1996	1,340	1	13,444	304,982	3,237	323,004	1,114	31	3,615	8,370	4,425	17,555 [d]	2,454	32	17,059	313,352	7,662	340,559
1997	2,449	0	4,694	-	5,747	12,890	1,146	62	2,761	5,779	1,612	11,360 [d]	3,595	62	7,455	5,779	7,359	24,250
1998	910	0	3,624	236,171	7,080	247,785	982	92	1,872	6,270	1,034	10,250 [d]	1,892	92	5,496	242,441	8,114	258,035
1999	581	0	2,398	0	2,181	5,160	818	183	1,556	5,092	467	8,116 [d]	1,399	183	3,954	5,092	2,648	13,276
2000	160	3	7,779	85,493	2,751	96,186	440	20	2,799	5,432	2,412	11,103 [d]	600	23	10,578	90,925	5,163	107,289
2001	90	0	2,864	0	1,619	4,573	936	143	2,090	10,172	1,553	14,895 [d]	1,026	143	4,754	10,172	3,372	19,468
2002	1	0	680	0	261	942	1,230	4	2,109	8,769	800	12,972 [d]	1,231	4	2,849	8,769	1,061	13,914
5-year avg. [a]	838	1	4,232	64,333	3,916	73,319	864	100	2,219	6,549	1,416	11,145	1,702	101	6,447	70,882	5,331	84,464
10-year avg. [b]	1,151	9	9,331	127,300	9,173	146,964	-	-	-	-	-	-	-	-	-	-	-	-

[a] 1997-2001

[b] 1992-2001

[c] Subsistence survey not conducted.

[d] Harvest estimated from Div. of Subsistence survey.

Appendix Table A7. Commercial and subsistence salmon catches by species, by year in Unalakleet Subdistrict, Norton Sound District, 1961-2002.

UNALAKLEET (SUBDISTRICT 6)

	Commercial						Subsistence						Combined					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1961	5,160	35	13,607	5,162	23,586	47,750	-	-	-	-	-	-	5,160	35	13,607	5,162	23,586	47,750
1962	5,089	-	6,739	6,769	30,283	48,880	-	-	-	-	-	-	5,089	-	6,739	6,769	30,283	48,880
1963	5,941	18	16,202	1,140	27,003	50,304	-	-	-	-	-	-	5,941	18	16,202	1,140	27,003	50,304
1964	1,273	1	79	1	19,611	20,965	488	-	2,227	7,030	6,726	16,471	1,761	1	2,306	7,031	26,337	37,436
1965	1,321	-	2,030	24	26,498	29,873	521	-	4,562	11,488	8,791	25,362 [4]	1,842	-	6,592	11,512	35,289	55,235
1966	1,208	-	4,183	5,023	16,840	27,254	90	-	789	6,083	3,387	10,349 [5]	1,298	-	4,972	11,106	20,227	37,603
1967	1,761	-	1,844	21,961	8,502	33,758	480	-	484	9,964	-	10,938 [6]	2,241	-	2,028	31,925	8,502	44,696
1968	960	-	6,549	41,474	14,865	63,848	186	-	1,493	11,044	2,932	15,705 [7]	1,146	-	8,042	52,518	17,847	79,553
1969	2,276	-	5,273	40,558	22,932	70,139	324	-	1,483	4,230	4,196	10,233 [8]	2,600	-	6,756	44,788	26,228	80,372
1970	1,604	-	4,261	30,779	40,029	76,673	495	-	3,907	10,104	7,214	21,720 [9]	2,099	-	8,168	40,883	47,243	98,393
1971	2,166	-	2,669	1,196	37,543	43,593	911	-	3,137	2,239	7,073	13,351 [9]	3,077	-	5,825	3,426	44,616	56,944
1972	2,235	-	412	28,231	20,440	51,318	643	-	1,818	3,132	4,132	9,725 [9]	2,878	-	2,230	31,363	24,572	61,043
1973	1,397	-	3,922	13,335	25,716	49,370	323	-	213	6,233	3,426	10,195	1,720	-	9,135	19,568	29,142	59,565
1974	2,100	-	1,778	93,332	36,170	133,380	313	-	706	7,341	588	8,948	2,413	-	2,484	100,673	36,758	142,328
1975	1,838	-	3,167	12,137	48,740	65,882	163	-	74	4,768	2,038	7,033	1,801	-	3,241	16,895	50,778	72,715
1976	1,211	1	5,141	37,203	24,268	67,824	142	-	694	4,316	2,832	7,984	1,353	1	5,835	41,519	27,100	75,808
1977	2,691	1	2,781	21,001	32,936	59,410	723	-	1,557	8,870	6,085	17,235	3,414	1	4,338	29,871	39,021	76,645
1978	7,525	5	5,737	136,200	37,079	186,546	1,044	-	2,536	13,268	3,442	20,292	8,569	5	8,275	149,468	40,521	206,838
1979	6,354	8	23,696	49,647	30,445	110,150	640	-	3,330	6,960	1,597	12,527	6,994	8	27,026	56,607	32,042	122,677
1980	4,339	3	21,512	203,142	64,198	293,194	1,046	-	4,758	19,071	5,230	30,105	5,385	3	26,270	222,213	69,428	323,299
1981	6,157	47	29,845	123,233	39,186	198,468	869	24	5,808	5,750	4,235	16,686	7,026	71	35,653	128,983	43,421	215,154
1982	3,768	2	61,343	142,856	44,520	252,489	913	2	7,037	20,045	4,694	32,691	4,681	4	68,380	162,901	49,214	285,180
1983	7,022	13	36,098	28,198	109,220	178,551	1,868	23	6,888	13,808	4,401	26,998	8,890	46	42,986	40,006	113,621	205,549
1984	6,804	6	47,904	-	43,317	98,031	1,650	1	6,675	17,418	3,348	29,092	8,454	7	54,579	17,418	46,665	127,123
1985	12,621	21	15,421	1	25,111	53,175	1,397	3	2,244	55	1,968	5,667	14,018	24	17,665	56	27,079	58,842

-Continued-

Appendix Table A7. Commercial and subsistence salmon catches by species, by year in Unalakleet Subdistrict, Norton Sound District, 1961-2002.

UNALAKLEET (SUBDISTRICT 6)

	Commercial						Subsistence						Combined					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1986	4,494	153	20,580	-	30,239	55,466	-	-	-	-	0	- [c]	-	-	-	-	-	-
1987	3,246	141	15,097	97	17,525	36,106	-	-	-	-	-	- [c]	-	-	-	-	-	-
1988	2,218	157	24,232	23,730	25,363	75,700	-	-	-	-	-	- [c]	-	-	-	-	-	-
1989	4,402	222	36,025	-	20,825	61,474	-	-	4,681	17,500	1,388	- [c]	-	-	-	-	-	-
1990	5,998	358	52,015	-	23,659	82,030	2,476 [a]	-	-	-	-	-	-	-	-	-	-	-
1991	4,534	147	52,039	-	39,609	96,323	-	-	-	-	-	- [d]	-	-	-	-	-	-
1992	3,409	229	84,449	5,284	52,547	146,918	-	-	-	-	-	- [d]	-	-	-	-	-	-
1993	5,944	251	26,290	42,061	28,156	102,702	-	-	-	-	-	- [d]	-	-	-	-	-	-
1994	4,400	71	71,019	480,158	12,288	567,936	5,294	819	16,081	31,572	12,732	66,498 [f]	9,694	890	87,100	511,730	25,020	634,434
1995	7,617	78	31,260	37,009	24,843	100,827	5,049	807	13,110	17,246	13,460	49,672 [f]	12,666	885	44,390	54,255	38,303	150,499
1996	3,644	-	52,200	113,837	7,369	177,050	5,324	608	15,963	19,782	16,481	58,157 [f]	8,968	608	68,163	133,619	23,850	235,207
1997	9,067	159	26,079	-	17,139	52,444	6,325	353	9,120	10,804	7,649	34,251 [f]	15,392	512	35,199	10,804	24,788	86,695
1998	6,413	7	24,534	99,412	6,210	136,576	3,963	201	7,303	13,173	2,551	27,191 [f]	10,376	208	31,837	112,585	8,761	163,767
1999	1,927	0	10,264	0	5,700	17,891	2,691	537	8,140	10,067	3,692	25,127 [f]	4,618	537	18,404	10,067	9,392	43,018
2000	582	11	29,803	17,278	2,700	50,374	2,429	212	5,878	10,631	3,000	22,150 [f]	3,011	223	35,681	27,909	5,700	72,524
2001	116	1	15,102	0	1,512	16,731	3,662	376	9,520	11,710	9,165	34,434 [f]	3,778	377	24,622	11,710	10,677	51,165
2002	4	1	1,079	0	339	1,423	2,367	280	4,986	15,557	3,877	27,069 [f]	2,371	281	6,067	15,557	4,216	28,492
5-year avg. [a]	3,621	36	21,156	23,338	6,652	54,803	3,814	336	7,992	11,277	5,211	28,631	7,435	371	29,149	34,615	11,864	83,434
10-year avg. [b]	4,312	81	37,102	79,604	15,846	136,945	-	-	-	-	-	-	-	-	-	-	-	-

[a] 1997-2001

[b] 1992-2001

[c] Subsistence catches from 1966-72 includes fish taken at St. Michael.

[d] Subsistence surveys not conducted.

[e] In-depth survey by Subsistence Division.

[f] Harvest estimate from Div. of Subsistence survey. Includes harvest in Stebbins and St. Michael.

Appendix Table A8. Commercial and subsistence salmon catches by species, by year for all subdistricts in Norton Sound District, 1961-2002.

ALL SUBDISTRICTS

Year	Commercial						Subsistence						Combined					
	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1961	5,300	35	13,807	34,327	48,332	101,801	-	-	-	-	-	-	5,300	35	13,807	34,327	48,332	101,801
1962	7,286	18	9,156	33,187	182,784	232,431	-	-	-	-	-	-	7,286	18	9,156	33,187	182,784	232,431
1963	6,613	71	16,765	55,625	154,789	233,883	5	-	118	16,607	17,635	34,365	6,918	71	16,883	72,232	172,424	268,228
1964	2,018	126	98	13,567	148,862	164,671	565	-	2,567	9,225	12,486	24,843	2,583	126	2,665	22,792	161,348	189,514
1965	1,449	30	2,030	229	36,795	40,524	574	-	4,812	19,131	30,772	55,289	2,023	30	6,842	19,360	67,567	95,813
1966	1,503	14	5,755	12,778	80,245	100,345	269	-	2,210	14,335	21,873	38,687	1,822	14	7,965	27,113	102,118	139,032
1967	1,804	-	2,379	28,879	41,756	74,818	817	-	1,222	17,516	22,724	42,279	2,621	-	3,601	46,395	64,480	117,097
1968	1,645	-	6,865	71,179	45,300	124,989	237	-	2,391	36,912	11,691	51,231	1,882	-	9,276	108,091	56,991	176,610
1969	2,392	-	6,836	86,949	82,795	178,972	436	-	2,191	18,562	15,615	36,804	2,828	-	9,027	105,511	98,410	215,776
1970	1,853	-	4,423	84,908	107,034	178,218	561	-	4,675	26,127	22,763	54,126	2,414	-	9,098	91,035	129,797	232,344
1971	2,593	-	3,127	4,895	131,362	141,977	1,026	197	4,097	10,863	21,618	37,801	3,619	197	7,224	15,758	152,980	179,778
1972	2,938	-	454	45,162	100,920	149,494	804	93	2,319	14,156	13,873	31,247	3,742	-	2,773	59,340	114,793	180,741
1973	1,918	-	9,282	46,499	119,098	176,797	392	-	520	14,770	7,185	22,867	2,310	-	9,802	61,269	126,283	199,664
1974	2,961	-	2,092	148,519	162,257	315,829	409	-	1,064	18,426	3,058	21,868	3,371	-	3,156	164,945	166,225	337,697
1975	2,393	2	4,593	32,366	212,485	251,861	186	11	192	15,803	8,113	24,305	2,579	13	4,785	48,191	220,598	276,166
1976	2,240	11	6,934	67,919	95,959	193,063	203	-	1,064	18,048	7,718	26,973	2,446	11	7,998	105,967	103,674	220,036
1977	4,503	5	3,690	48,675	200,456	257,325	846	-	2,530	14,296	26,607	44,279	5,346	5	6,220	62,971	227,052	301,604
1978	9,819	12	7,335	325,503	189,279	531,948	1,211	-	2,981	35,281	12,257	51,730	11,030	12	10,316	360,784	201,536	583,678
1979	10,706	57	31,438	167,411	140,789	350,401	747	-	8,487	25,247	11,975	46,456	11,453	57	39,925	192,658	152,764	396,857
1980	6,311	40	29,842	227,352	180,792	444,337	1,397	-	8,625	63,778	19,622	93,422	7,708	40	38,467	291,130	200,414	537,759
1981	7,929	56	31,582	232,479	169,708	441,754	2,021	38	13,416	28,741	32,866	77,082	9,950	94	44,978	261,220	202,574	518,816
1982	5,892	10	91,690	230,281	183,335	511,208	1,011	8	14,612	54,249	18,560	88,440	6,903	18	106,302	284,530	201,915	599,668
1983	10,308	27	49,735	76,913	319,437	456,420	-	-	-	-	-	-	-	-	-	-	-	-
1984	8,458	6	67,875	119,381	146,442	342,158	-	-	-	-	-	-	-	-	-	-	-	-

-Continued-

Appendix Table A8. Commercial and subsistence salmon catches by species, by year for all subdistricts in Norton Sound District, 1961-2002

ALL SUBDISTRICTS

Year	Commercial						Subsistence						Combined					
	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1985	19,491	166	21,968	3,647	134,928	180,200	-	-	-	-	-	-	-	-	-	-	-	-
1986	6,396	233	35,600	41,260	146,912	230,400	-	-	-	-	-	-	-	-	-	-	-	-
1987	7,080	207	24,279	2,260	102,457	136,283	-	-	-	-	-	-	-	-	-	-	-	-
1988	4,096	1,252	37,214	74,604	107,966	225,132	-	-	-	-	-	-	-	-	-	-	-	-
1989	5,707	265	44,091	123	42,625	92,811	-	-	-	-	-	-	-	-	-	-	-	-
1990	8,895	434	56,712	501	65,123	131,665	-	-	-	-	-	-	-	-	-	-	-	-
1991	6,068	203	63,647	-	86,871	156,789	-	-	-	-	-	-	-	-	-	-	-	-
1992	4,541	296	105,418	6,284	83,394	199,933	-	-	-	-	-	-	-	-	-	-	-	-
1993	8,972	279	43,283	157,574	53,562	263,670	-	-	-	-	-	-	-	-	-	-	-	-
1994	[c,e] 5,255	80	102,140	982,389	16,290	1,106,184	7,374	1,161	22,124	71,066	25,020	126,745	12,659	1,241	124,264	1,053,455	43,310	1,234,929
1995	[c,e] 8,860	128	47,862	81,644	42,898	181,392	7,786	1,222	23,015	38,594	43,014	113,611	16,626	1,350	70,877	120,238	85,912	295,003
1996	[c,e] 4,864	1	68,206	487,441	10,609	571,241	7,255	1,182	26,304	64,724	34,585	134,050	12,239	1,183	94,510	552,165	45,194	705,291
1997	[c,d,e] 12,573	161	32,284	28	34,103	79,141	6,998	1,892	16,476	27,200	26,803	81,370	21,571	2,053	48,760	27,220	60,906	160,511
1998	[c,e,f] 7,429	7	29,623	588,013	16,324	641,396	8,295	1,214	19,007	51,933	20,032	100,480	15,724	1,221	48,630	639,946	36,356	741,876
1999	[c,e] 2,508	0	12,662	0	7,881	23,051	6,144	1,177	14,042	20,017	19,398	61,078	8,652	1,177	27,004	20,017	27,279	84,129
2000	[c,e] 752	14	44,409	166,548	6,150	217,873	4,149	662	17,062	38,308	17,283	77,465	4,901	676	61,471	204,856	23,433	295,358
2001	[c,e] 213	44	19,492	0	11,100	30,849	5,576	767	14,543	30,253	20,210	71,349	5,789	811	34,035	30,253	31,310	102,198
2002	[c,e] 5	1	1,759	0	600	2,365	5,469	763	15,085	64,364	17,817	103,499	5,474	764	16,845	64,364	18,417	105,864
5-year avg [a]	4,695	45	27,684	158,916	15,112	198,462	6,032	1,146	16,286	33,542	20,745	76,302	11,327	1,192	43,969	184,459	35,857	276,614
10-year avg [b]	5,812	101	50,538	246,991	28,431	331,673	-	-	-	-	-	-	-	-	-	-	-	-

[a] 1997-2001

[b] 1992-2001

[c] These figures also include subsistence estimates data from Stebbins and St. Michael

[d] Subsistence surveys not conducted

[e] Subsistence harvest estimate from Div. of Subsistence survey.

[f] Subsistence totals include Savoonga and Gamble

Appendix Table A9. Mean commercial salmon harvest weights, Norton Sound District, 1964-2002.

	Mean Round Weight in Pounds [a]			
Year	Chinook	Coho	Pink	Chum
1964	-	-	-	7.0
1965	-	-	2.3	7.1
1966	-	-	3.5	7.8
1967	23.7	7.0	3.6	7.2
1968	20.0	7.0	4.0	7.5
1969	19.3	7.5	3.6	6.4
1970	20.0	7.0	3.5	7.8
1971	23.7	7.0	3.6	7.2
1972	20.0	7.3	2.8	6.9
1973	20.3	6.8	3.9	7.1
1974	18.2	6.7	3.4	6.6
1975	10.8	7.4	2.9	6.5
1976	15.2	7.2	3.1	7.0
1977	22.7	7.6	3.3	7.0
1978	22.8	6.9	3.6	7.4
1979	22.9	7.1	3.6	7.2
1980	21.5	6.8	3.2	7.2
1981	20.7	6.7	3.5	7.6
1982	16.5	7.1	2.9	7.3
1983	17.4	7.2	3.6	7.4
1984	20.0	7.7	2.9	7.0
1985	21.5	7.7	3.1	7.0
1986	20.8	6.9	3.2	6.9
1987	20.0	7.3	3.0	7.1
1988	16.4	7.5	3.0	7.1
1989	18.4	7.6	3.6	7.0
1990	19.0	7.5	-	7.4
1991	17.7	7.4	-	6.9
1992 [b]	12.7	7.8	2.9	7.1
1993	16.9	6.6	2.6	6.5
1993	18.6	7.5	2.2	6.7
1995	19.7	7.4	2.4	6.7
1996	19.2	8.4	2.4	7.9
1997	17.9	7.3	2.5	7.4
1998	17.2	7.9	2.3	6.5
1999	19.3	6.9	-	7.3
2000	14.9	6.9	2.2	6.5
2001	17.8	7.8	-	7.2
2002 [b]	10.0	7.4	-	7.6

[a] Based on age-weight-length samples or fish tickets.

[b] Low chinook weight due to utilization of restricted mesh size.

Appendix Table A.10. Estimated mean prices paid to commercial salmon fishers, Norton Sound District, 1962 - 2002.

Year	Chinook	Coho	Pink	Chum
		Price Per Fish		
1962	$3.85	$0.60	$0.25	$0.35
1963	$3.85	$0.60	$0.25	$0.35
1964	$4.50	-	$0.25	$0.40
1965	$3.75	$0.45	-	$0.40
1966	$4.80	$1.05	$0.25	$0.65
		Price Per Pound		
1967	$0.20	$0.14	$0.07	$0.09
1968	$0.25	$0.14	$0.06	$0.10
1969	$0.22	$0.14	$0.06	$0.11
1970	$0.25	$0.14	$0.06	$0.10
1971	$0.25	$0.14	$0.07	$0.10
1972	$0.27	$0.16	$0.06	$0.11
1973	$0.40	$0.16	$0.07	$0.32
1974	$0.40	$0.16	$0.13	$0.32
1975	$0.40	$0.16	$0.13	$0.24
1976	$0.50	$0.32	$0.17	$0.30
1977	$0.55	$0.40	$0.16	$0.30
1978	$0.65	$0.35	$0.20	$0.30
1979	$0.88	$0.66	$0.16	$0.41
1980	$0.74	$0.63	$0.07	$0.23
1981	$1.25	$0.62	$0.13	$0.26
1982	$1.25	$0.57	$0.12	$0.32
1983	$1.13	$0.39	$0.11	$0.28
1984	$1.20	$0.45	$0.11	$0.24
1985	$1.08	$0.48	$0.20	$0.31
1986	$0.88	$0.52	$0.15	$0.27
1987	$1.11	$0.57	$0.20	$0.33
1988	$1.26	$1.13	$0.19	$0.39
1989	$0.73	$0.43	$0.10	$0.18
1990	$1.01	$0.50	$0.75 [a]	$0.23
1991 [b]	$0.87	$0.36	-	$0.27
1992 [c]	$0.66	$0.33	$0.16	$0.22
1993 [d]	$0.72	$0.22	$0.15	$0.24
1994	$1.02	$0.52	$0.15	$0.29
1995	$0.66	$0.43	$0.18	$0.18
1996	$0.54	$0.28	$0.10	$0.08
1997	$1.00	$0.47	$0.06	$0.11
1998	$0.74	$0.29	$0.14	$0.09
1999	$0.82	$0.35	-	$0.11
2000	$1.30	$0.30	$0.10	$0.15
2001 [e]	$1.00	$0.25	-	$0.19
2002	$0.39	$0.20	-	$0.07
5 yr. Avg. 1997-2001	$0.97	$0.33		$0.13

[a] Price paid per pound of roe.

[b] Price paid for coho and chum roe was $3.00 per pound.

[c] Price paid for coho roe was $1.50 per pound.

[d] Price paid for coho roe was $1.76 per pound and $0.40 per pound for sockeye.

[e] Price paid sockeye was $0.37 per pound.

Appendix Table A11. Dollar estimates of Norton Sound District commercial salmon fishery, 1961 - 2002.

Year	Gross Value of Catch to Fishermen	Wages Earned [b]	License and Tax Revenues to State (License Fees Only)
1961	[a]	[a]	$2,010.00
1962	$105,900.00	[a]	$16,341.00
1963	$104,000.00	[a]	$18,009.00
1964	$51,000.00	[a]	$11,305.00
1965	$21,483.00	[a]	$5,084.00
1966	$68,000.00	[a]	$4,680.00
1967	$44,038.00	$58,000.00	$3,500.00
1968	$63,700.00	[a]	$4,000.00
1969	$95,297.00	$72,145.00	[a]
1970	$99,019.00	$55,100.00	$5,595.00
1971	$101,000.00	$65,500.00	$5,730.00
1972	$102,225.00	$68,700.00	$7,000.00
1973	$306,740.00	$81,000.00	$15,400.00
1974	$437,127.00	$129,600.00	$20,028.00
1975	$413,285.00	$172,800.00	$28,230.00
1976	$265,283.00	[a]	$10,133.00
1977	$546,010.00	[a]	$11,386.00
1978	$907,330.00	[a]	$12,002.00
1979	$878,792.00	[a]	$11,760.00
1980	$572,125.00	[a]	$11,640.00 [c]
1981	$761,658.00	[a]	$11,940.00
1982	$1,069,723.00	[a]	$7,155.00 [c,d]
1983	$945,232.00	[a]	$10,700.00 [c]
1984	$738,064.00	[a]	$9,690.00 [c]
1985	$818,477.00	[a]	$5,820.00 [e]
1986	$546,452.00	[a]	$5,970.00 [f]
1987	$517,894.00	[a]	$5,940.00 [e]
1988	$760,641.00	[a]	$10,050.00 [e,f]
1989	$319,469.00	[a]	$10,300.00 [e]
1990	$474,064.00	[a]	$10,350.00 [e]
1991	$413,479.00	[a]	$10,250.00 [e]
1992	$463,616.00	[a]	$10,200.00 [e]
1993	$368,723.00	[a]	$8,835.00 [e]
1994	$863,060.00	[a]	$10,000.00 [e]
1995	$356,184.00	[a]	$5,250.00 [e]
1996	$292,264.00	[a]	$4,300.00 [e]
1997	$326,618.00	[a]	$5,100.00 [e]
1998	$351,410.00	[a]	$4,100.00 [e]
1999	$82,638.00	[a]	[a] [e]
2000	$143,621.00	[a]	[a] [e]
2001	$56,921.00	[a]	[a]
2002	$2,941.00	[a]	[a] [e]

[a] Information not available.

[b] Includes wages paid to tender boat operators, processing plant employees in district.

[c] Includes only permit renewals and vessel license fees.

[d] The Alaska state legislature lowered all resident permit renewal fees and vessel license fees to poverty level fees for 1982.

[e] Includes only permit renewal fees.

[f] The Alaska state legislature raised resident permit renewal fee to $50.00 in 1988.

Appendix Table A12. Round weight of commercially caught salmon by species, Nortoo Sound District, 1961 - 2002.

	Pounds Caught (Round Wt.)				
Year	Chinook	Coho	Pink	Chum	Salmon Roe (lbs)
1961	120,405	96,649	102,711	347,990	
1962 [a]	157,000	-	10,569	221,645	
1963 [a]	89,700	51,750	-	-	
1964 [a]	39,169	686	-	249,890	
1965	33,327	14,210	660	264,924	[b]
1966	35,259	40,285	38,334	577,764	16,901
1967	41,854	15,944	100,913	289,473	21,429
1968 [a]	22,954	50,665	250,044	306,871	20,381
1969 [d]	51,441	50,461	312,836	529,235	5,578
1970	38,103	25,000	156,313	610,588	1,345
1971	43,112	22,078	15,377	857,014	1,122
1972	57,675	3,257	133,389	710,853	1,083
1973	38,935	63,812	185,799	845,596	[b]
1974	54,433	15,023	511,737	1,082,575	39,876
1975	25,964	32,345	87,586	1,318,111	46,470
1976	34,095	49,822	271,867	669,728	[b]
1977	102,341	28,044	162,457	1,415,981	[b]
1978	222,974	50,872	1,164,174	1,389,806	[b]
1979	231,988	251,129	598,785	1,001,548	[b]
1980	135,646	204,498	719,368	1,301,693	[b]
1981	164,182	212,065	719,102	1,284,193	[b]
1982	97,255	648,212	659,171	1,338,788	95
1983	179,666	360,264	274,568	2,352,104	239
1984	169,104	523,310	343,685	1,020,635	0
1985	419,331	169,413	11,458	939,885	0
1986	133,161	247,333	133,319	1,011,824	0
1987	141,494	177,369	6,691	731,597	0
1988	67,148	280,658	226,966	767,168	0
1989	104,829	336,652	439	297,156	0
1990	168,745	426,902	-	482,060	75
1991	107,541	469,495	-	597,272	221
1992	57,571	820,406	18,230	595,345	2,641
1993	151,504	287,702	406,820	347,072	2,608
1994	98,492	102,140	2,185,066	122,540	0
1995	174,771	356,190	198,121	290,445	0
1996	95,794	573,372	1,196,115	84,349	0
1997	225,136	235,517	50	253,006	880
1998	127,831	232,705	1,330,624	106,687	0
1999	48,421	88,037	0	57,656	0
2000	11,240	307,565	369,800	40,298	0
2001	3,803	152,293	0	79,558	0
2002	50	12,972	0	4,555	0

[a] Does not include canned salmon cases (48#); 1962: 29 chinook, 883 coho, 927 pink, 12,459 chum; 1963: 504 chinook, 808 coho, 1,918 pink, 13,308 chum; 1964: 75 chinook, 452 pink, 9,357 chum.

[b] Information not available.

[c] Includes about 48,000 lbs of salted coho, about 150,000 lbs. of salted pink, and 150,000 lbs of salted chum.

[d] Includes 598 lbs. of salted chinook, 48,092 lbs. of salted pink and 117,664 lbs. salted chum.

Appendix Table A13. Commercial salmon catches by species, Norton Sound District, 1961-2002.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1961	5,300	35	13,807	34,327	48,332	101,801
1962	7,295	18	9,158	33,187	182,784	232,431
1963	6,813	71	16,765	55,625	154,789	233,863
1964	2,018	126	98	13,587	148,862	164,671
1965	1,449	30	2,030	220	36,795	40,524
1966	1,553	14	5,755	12,778	80,245	100,345
1967	1,804	-	2,379	28,879	41,756	74,818
1968	1,045	-	6,885	71,179	45,300	124,409
1969	2,392	-	6,836	88,949	82,795	178,972
1970	1,853	-	4,423	64,908	107,034	178,218
1971	2,593	-	3,127	4,895	131,362	141,977
1972	2,938	-	454	45,182	100,920	149,494
1973	1,913	-	9,282	46,499	119,098	176,797
1974	2,951	-	2,092	148,519	162,267	315,829
1975	2,383	2	4,593	32,388	212,485	251,861
1976	2,243	11	6,934	87,916	95,956	193,060
1977	4,500	5	3,690	48,675	200,455	257,325
1978	9,819	12	7,335	325,503	189,279	531,948
1979	10,706	57	31,438	167,411	140,789	350,401
1980	6,311	40	29,842	227,352	180,792	444,337
1981	7,929	56	31,562	232,479	169,708	441,734
1982	5,892	10	81,690	230,281	183,335	511,208
1983	10,308	27	49,735	76,913	319,437	456,420
1984	8,455	6	67,875	119,381	146,442	342,159
1985	19,491	166	21,968	3,647	134,928	180,200
1986	6,395	233	35,600	41,260	146,912	230,400
1987	7,080	207	24,279	2,260	102,457	136,283
1988	4,096	1,252	37,214	74,604	107,966	225,132
1989	5,707	265	44,091	123	42,625	92,811
1990	8,895	434	56,712	501	65,123	131,665
1991	6,068	203	63,647	0	86,871	156,789
1992	4,541	296	105,418	8,284	83,394	199,933
1993	8,972	279	43,283	157,574	53,562	263,670
1994	5,285	80	102,140	982,389	18,290	1,108,184
1995	8,860	128	47,862	81,644	42,898	181,382
1996	4,984	1	68,206	487,441	10,609	571,241
1997	12,573	161	32,284	20	34,103	79,141
1998	7,429	7	29,623	588,013	16,324	641,396
1999	2,508	0	12,662	0	7,881	23,051
2000	752	14	44,409	166,548	6,150	217,873
2001	213	44	19,492	0	11,100	30,849
2002	5	1	1,759	0	600	2,365
Previous 5-Yr Avg [a]	4,695	45	27,694	150,916	15,112	198,462
Previous 10-Yr Avg [b]	5,812	101	50,538	246,991	28,431	331,673

[a] 1997-2001

[b] 1992-2001; odd years only for pink salmon

Appendix Table A14 Comparative salmon escapement indices of Norton Sound streams, 1961-2002

	Shaw River					Nome River					Fish Creek				
Year[a]	Chinook	Chum	Pink	Pink & Chum[b]	Coho	Chinook	Chum	Pink	Pink & Chum[c]	Coho	Chinook	Chum	Pink	Pink & Chum[b]	Coho
1961															
1962															
1963															
1964															
1965															
1966															
1967															
1968															
1969															
1970															
1971						-	75	7,765	-	-					
1972						-	710	14,960	-	-					
1973						6	1,760	14,940	-	-					
1974						-	854	17,832	-	-					
1975	-	4,682	3,801	-	-	1	2,101	3,405	-	-					
1976											-	375	1,994	-	-
1977	-	5,287	1,302	-	-	5	3,046	1,756	-	-	-	1,275	10	-	-
1978	-	8,756	22,431	-	-	2	5,242	34,900	-	-	-	7,210	-	-	-
1979											-	283	291	-	-
1980	3	2,022	199,008	-	1,082	5	-	-	179,005	928	-	-	-	19,199	-
1981	-	5,579	350	-	-	13	1,293	12,365	-	-	1	12,031	2,710	-	-
1982	-	638	148,800	-	-	-	200	327,570	-	-	1	5,097	25,004	-	-
1983	40	2,130	10,779	-	96	3	198	8,170	-	361	2	1,295	200	-	-
1984	1 [b]	493 [b]	284,406 [b]	-	107	-	2,084 [b]	178,870	-	836	1	3,150 [d]	20,200 [d]	-	-
1985	4	1,010	8,866	-	38	7	1,967	2,250	-	242	1	3,215	260	-	-
1986	4	1,960	28,690	-	-	2	1,150	43,580	-	-	2	3,075	300	-	-
1987	5	4,540	30	-	230	3	1,686	1,480 [b]	-	419	0	115	0	-	-
1988	1	2,070	4,652 [f]	-	563	3	973	2,400 [f]	-	1,280 [b]	3	765	19	-	-
1989	-	1,025	26,850	-	75	2	72	1,365	-	371	-	-	-	-	-
1990	-	95	29,040	-	161	-	341	13,085	-	617	-	-	-	-	-
1991	3	5,420	14,680	-	701	9	3,510	4,690	-	615	2	1,564	575	-	-
1992	-	470	292,400	-	477	9	813	251,700	-	603	-	606	180	-	-
1993	7	1,530	5,129	-	110	6	1,520	8,941	-	276 [e]	-	1,590	-	-	-
1994	10	1,140	492,000	-	307	2	300	261,450	-	631 [e]	1	4,960	790	-	-
1995	-	3,130	1,350	-	700	-	1,855	182	-	537	-	6,455	350	-	62
1996	5	1,815	74,100	-	367	-	799	34,520	-	723	-	5,390	-	-	-
1997	-	2,975	1,200	-	57	4	956	63	-	544	1	627	-	-	96
1998	-	630	372,550	-	327	3	335	179,689	-	513	1	2,828	1880	-	-
1999	-	1,097	180	-	217	-	325	340	-	629	-	55	-	-	
2000	-	10	12,608	-	912	-	658	6,300	-	1,130 [e]	-	829	640	-	11
2001	-	3,740	213 [e]	-	720 [e]	-	940 [f]	790 [e]	-	1,302 [e]	-	3,032	6 [g]	-	213 [e]
2002	-	1,084	23,487	-	1,209 [h]	-	127 [e]	295 [e]		1,799	-	1,876 [e]	1032 [e]		186 [e]

[a] Represents "high count" for season.

[b] Surveyor unable to distinguish between the two species.

[c] Poor survey conditions or partial survey, poor counting tower conditions.

[d] Total counts obtained from counting tower.

[e] Combined tower and aerial survey counts below the tower.

[f] Aerial survey; not tower count.

[g] Helicopter survey.

[h] Boat survey.

[i] Foot survey.

[j] Includes counts from Casadepaga and Ophir Creeks.

[k] Includes counts from Ophir Creek.

[l] Numerous pink salmon made enumerating of chum salmon difficult, pink count may include some chum.

Appendix Table A14. Comparative salmon escapement indices of Norton Sound streams, 1961-2002

	Eldorado					Fish River					Boston Creek				
Year	Chinook	Chum	Pink	Pink & Chum [1]	Coho	Chinook	Chum	Pink	Pink & Chum [2]	Coho	Chinook	Chum	Pink	Pink & Chum [3]	Coho
1961						1	-	-	14,160	-					
1962						48	-	-	28,908	-					
1963						21	-	-	25,728	-	67	1,609	-	-	-
1964						-	18,670	10,933	14,598	-	10	3,313	-	-	-
1965															
1966						7	-	-	17,925	-	153	702	-	-	-
1967						20	-	-	13,610	-					
1968						11	-	-	164,002	-	7	2,500	2,500	-	-
1969						-	2,000	124,000	-	-	100	7,000	16,000	-	-
1970						33	76,550	198,000	-	-	245	6,200	12,900	-	-
1971						1	13,185	1,620	-	-	42	7,045	50	-	-
1972						-	3,656	13,050	-	-	57	4,252	3,950	-	-
1973						31	6,857	25,564	-	-	153	5,014	3,213	-	-
1974	13	2,142	6,185	-	-	7	10,945	15,090	-	-	231	2,426	749	-	-
1975						26	20,114	15,840	-	-	147	1,883	2,594	-	
1976						1	8,300	15,850	8,550	-					
1977	-	1,835	125	-	-	9	9,664	3,430	-	-	76	1,325	305	-	-
1978	-	10,125	12,000	-	-	29	28,797	140,640	-	-	136	2,655	74,251	-	-
1979						11	9,393	9,132	-	-	58	882	271	-	-
1980	6	9,900	55,520	-	-	-	19,500	33,500	-	-	16	2,450	1,510	-	-
1981	-	13,605	405	-	-	90	24,093	420	-	-					
1982	2	1,895	163,300	-	-	-	-	-	741,780	-	10	1,730	22,970	-	-
1983	11	994	270	-	100	87	20,037	300	-	-	154	764	-	-	-
1984	14 [4]	4,361 [4]	1,924,933 [4]	-	261	42	-	-	293,245	-	33	-	-	47,850	-
1985	8	6,090	150	-	67	303	21,600	7,465	-	-	243	3,450	-	-	-
1986	9	3,490	18,200	-	-	201	23,180	140	-	-	2	220	0	-	-
1987	6	3,960	0	-	108	193	7,886	9	-	-	383	3,640	0	-	-
1988	17	2,645	1,045	-	78	36	1,240	29,960 [5]	-	-	163	1,040	7,480 [5]	-	-
1989	-	330	1,330	-	87						-	-	-	-	-
1990	17	884	2,030	-	64						-	1,455	8,440	-	-
1991	76	5,755	1,500	-	98	51	10,190	51,195	-	-	152	2,550	3,210	-	-
1992	-	4,007	6,615	-	113	4	800	1,987,000	-	-	68	1,546	803,200	-	-
1993	33	2,885	120	-	110	48	12,695	13,440	-	-	227	4,513	1,930	-	-
1994	2	5,140	53,800	-	242	55	16,500	210,000	-	-	95	4,270	355,600	-	-
1995	-	9,825	55	-	247	83	13,433	700	-	1,029	78	4,221	-	-	230
1996	21	23,829	40,100	-	354	186	5,940 [6]	684,720	-	-	133	3,505 [7]	35,980	-	-
1997	40	5,967	10	-	37	110	18,563	800	-	460	432	4,543	-	-	-
1998	8	3,800	123,950	-	71	96	28,000	660,000	-	-	255	418	175,380	-	-
1999	-	1,740	6	-	45	-	50	20	-	821	-	-	-	-	319
2000	2	3,363	16,080	-	211 [8]	-	-	-	-	800	-	-	-	-	414
2001	1	4,450	8 [9]	-	232 [8]	8	3,220	1,744	-	1,053	31	3,333	1,038	-	155
2002	8	320	10,780		465	-	-	-	-	-					

[1] Represents "high count" for season.

[2] Surveyor unable to distinguish between the two species.

[3] Poor survey conditions or partial survey; poor counting tower conditions

[4] Total counts obtained from counting towers

[5] Combined tower and aerial survey counts below the tower

[6] Aerial survey; not tower count.

[7] Helicopter survey.

[8] Boat survey.

[9] Foot survey.

[10] Includes counts from Ceudepuga and Ophir Creeks.

[11] Includes counts from Ophir Creek.

[12] Humpback pink salmon made enumerating of chum salmon difficult; pink count may include some chum.

Appendix Table A14 Comparative salmon escapement indices of Norton Sound streams, 1961-2002

	Nicholuk River					Kwiniuk River					Tubutulik River				
Year	Chinook	Chum	Pink	Pink & Chum [3]	Coho	Chinook [4]	Chum [5]	Pink [6]	Pink & Chum [7]	Coho [8]	Chinook	Chum	Pink	Pink & Chum [9]	Coho
1961															
1962	11	-	-	27,870	-	3	-	-	16,249	-	3	-	-	16,690	-
1963	1	15,687	4,193	-	-	2	21,299	3,779	-	-	9	10,869	4,355	-	-
1964	-	9,295	10,405	-	-	-	14,533	-	-	-	-	15,869	10,045	3,420	-
1965						14	26,634	8,301	-	-					
1966	-	21,300	8,600	4,700	-	7	32,786	10,635	-	-	-	5,514	26,000	-	-
1967	-	20,546	-	-	-	13	54,444	3,508	-	-	1	-	-	12,473	-
1968	-	-	-	87,883	-	27	18,813	126,764	-	-					
1969	-	10,246	91,650	-	-	12	19,587	56,683	-	-	3	12,640	12,708	3,045	-
1970	-	7,300	60,350	-	-	-	98,804	235,138	-	-	-	53,096	136,500	-	-
1971	-	22,605	3,370	-	-	37	39,646	16,742	-	-	-	16,830	7,500	5,068	-
1972	-	19,508	22,690	-	-	45	30,686	62,462	-	-	-	8,670	31,100	-	-
1973	-	14,361	14,790	-	-	57	28,617	38,429	-	-	131	5,383	13,665	-	-
1974	1	8,720	3,915	-	-	62	35,899	40,801	-	-	136	9,360	17,940	-	-
1975	-	10,080	14,238	-	-	48	18,344	51,917	-	-	7	17,141	38,063	-	-
1976	-	4,130	7,150	-	-	12	8,977	29,471	-	-	-	1,995	6,095	2,680	-
1977	19	10,830	4,150	-	-	84	52,737	93,234	-	-	-	8,340	4,602	-	-
1978	2	14,965	208,369	-	-	74	14,408	72,270	-	-	2	5,865	1,364	-	-
1979	8	10,127	30,347	-	-	107	12,359	167,892	-	-	-	812	1,624	-	-
1980	-	8,915	71,770	-	-	177	10,174	320,389	-	-	405	23,616	603,937	-	-
1981	-	7,349	-	-	-	136	34,361	566,534	-	-	-	-	-	-	-
1982	20	2,157	227,540	-	-	138	41,036	809,671	-	-	49	3,044	33,605	-	-
1983	34	6,886	50	-	-	267	50,907	254,536	-	-	139	10,545	46,790	-	-
1984	6	-	-	57,208	3,072	756	54,043	603,591	-	983	139	16,310	93,600	-	-
1985	25	11,140	-	-	333	712	9,932	10,237	-	673	472	13,645	8,040	-	-
1986	2	2,442	9	-	-	653	24,704	141,646	-	421	453	5,975	35,080	-	-
1987	10	4,145	9	-	257	314	16,134	5,567	-	819	474	9,605	900	-	-
1988	10	6,301	8,169	-	1,095	321	15,301	187,991	-	444	561	4,660	114,450	-	-
1989	-	-	-	-	183	282	13,089	27,488	-	-	-	-	-	-	-
1990	-	6,200	-	-	170	744	15,285	416,512	-	740	397	4,350	186,400	-	-
1991	24	10,660	37,430	-	1,703	387	18,852	33,499	-	809	661	7,085	24,878	-	-
1992	-	7,779	863,200	-	811	479	13,077	1,464,717	-	532	260	2,595	130,600	-	-
1993	15	10,510	2,840	-	2,301	563	15,823	43,165	-	1,230	1,081	8,780	15,650	-	1,305
1994	7	16,470	1,204,300	-	274	627	33,010	2,301,981	-	3,811	no survey due to poor conditions				
1995	49	25,398	200	-	2,136	805	53,861	17,300	-	1,675	377	16,158	4,020	-	930
1996	25	9,782	158,950	-	7,547	567	27,256	907,994	-	1,410	490	10,790	236,730	-	-
1997	131	16,550	-	-	883	972	35,116	9,586	-	620	1,046	3,195	16,890	-	-
1998	54	2,356	205,119	-	393	256	24,248	655,955	-	810	904	10,180	112,401	-	-
1999	-	680	-	-	618	114	5,302	607	-	225	-	-	-	-	-
2000	-	-	845,554	-	3,512	-	-	341	-	548	-	-	-	-	0
2001	6	2,488	2,854	-	809	22	409	-	-	-	77	803	-	-	-
2002					1,122	1	2	53,986	-		67	180	182,009	-	-

[1] Represents "high count" for stream.

[2] Surveys unable to distinguish between the two species.

[3] Poor survey conditions or partial survey, poor counting tower conditions

[4] Total counts obtained from counting towers.

[5] Combined tower and aerial survey counts below the towers.

[6] Aerial survey; not tower count.

[7] Helicopter survey.

[8] Boat survey.

[9] First survey.

[10] Includes counts from Casadepaga and Ophir Creeks.

[11] Includes counts from Ophir Creek.

[12] Numerous pink salmon made enumerating of chum salmon difficult; pink count may include some chum.

Appendix Table A14 Comparative salmon escapement indices of Nelson Sound streams, 1961-2002

	North River				
Year	Chinook	Chum	Pink	Pink & Chum [a]	Coho
1961					
1962	162	-	-	16,080	-
1963 [b]	287	-	-	73,274	-
1964	23	-	-	5,981	-
1965	153	-	-	16,600	-
1966					
1967					
1968					
1969					
1970 [c]	1	20,655	12,400	-	-
1971 [c]	256	-	-	1,047	-
1972 [d]	561	2,332	54,934	-	-
1973 [d]	298	4,332	26,542	-	-
1974 [d]	220	861	154,285	-	-
1975 [e]	60	5,259	17,885	-	-
1976 [e]	66	196	10,606	-	-
1977	1,275	8,139	4,565	-	-
1978	321	9,349	21,813	-	-
1979	735	1,139	9,500	-	-
1980	61	2,300	127,000	-	204
1981	68	405	575	-	263
1982	8	599	153,352	-	4,145
1983	347	4,135	6,950	-	-
1984 [f]	2,844	2,915	498,387	-	152 [g]
1985 [d]	1,476	4,567	4,360	-	2,043
1986 [d]	1,613	3,738	236,487	-	-
1987	445	392	0	-	680
1988	202	36	112,779 [h]	-	240
1989 [c]	-	-	-	-	-
1990	235	310	25,680	-	-
1991	656	2,435	118,720	-	2,510
1992	329	-	631,140	-	398
1993	900	845	13,570	-	1,397
1994	No survey due to poor conditions				
1995	652	1,320	18,500	-	690 [i]
1996	104	220 [j]	125,500	-	917
1997	1,603	9,045	17,879	-	-
1998	591	50	153,150	-	233
1999	18	1,488	3,700	-	523
2000	-	-	-	-	4,513
2001	567	330	-	-	-
2002	2	58	1,565	-	-

[a] Represents "high count" for stream.

[b] Surveyor unable to distinguish between the two species.

[c] Poor survey conditions or partial survey, poor counting tower operations.

[d] Total counts obtained from counting tower.

[e] Combined tower and aerial survey counts below the tower.

[f] Aerial survey, not tower count.

[g] Helicopter survey.

[h] Boat survey.

[i] Foot survey

[j] Includes counts from Cassalepega and Ophir Creeks.

[k] Includes counts from Ophir Creek.

[l] Numerous pink salmon made enumerating of chum salmon difficult; pink count may include some chum.

Appendix Table B1. Subsistence surveys conducted in Port Clarence District, 1963 - 2002.

Year		Number of Fishing Families Interviewed	Chinook	Sockeye	Coho	Pink	Chum	Total
1963		19	9	4,866	25	1,[illegible]	1,279	7,240
1964		22	17	1,475	227	371	1,049	3,139
1965		29	36	1,8[illegible]	639	1,854	1,602	5,935
1966		26	10	1,000	896	859	2,875	5,640
1967		19	12	2,0[illegible]8	232	[illegible]	1,073	4,152
1968		24	40	688	133	1,906	904	3,671
1969		13	2	180	27	548	932	1,689
1970		18	4	588	1,071	1,308	4,231	7,202
1971		22	31	850	959	1,171	3,769	6,780
1972		8	4	68	388	75	2,806	3,341
1973		4	22	46	280	424	1,562	2,334
1974		13	-	28	62	14	2,663	2,767
1975		17	-	244	5	743	1,589	2,581
1976		15	7	291	20	436	6,026	6,780
1977	[a]	13	-	-	-	-	-	5,910
1978		26	1	392	-	7,[illegible]3	705	8,881
1979		26	-	320	35	741	1,658	2,754
1980		22	7	3,195	5	3,170	1,715	8,092
1981		10	8	255	110	765	5,845	6,983
1982		27	23	405	100	4,345	684	5,557
1983	[b]	3	17	261	-	615	299	1,192
1984 - 1988	[c]							
1989	[d]	15	28	535	472	395	410	1,840
1990 - 1993	[c]							
1994	[e]	127	181	1,979	1,692	3,849	2,042	9,743
1995	[e]	122	76	4,481	1,739	3,293	6,011	15,600
1996	[e]	117	195	4,558	2,079	2,5[illegible]7	1,264	10,684
1997	[e]	126	158	3,177	829	755	2,099	7,019
1998	[e]	138	287	1,665	1,759	7,812	2,621	14,144
1999	[e]	155	89	2,392	1,030	786	1,936	6,233
2000	[e]	134	72	2,851	935	1,387	1,275	6,521
2001	[e]	160	84	3,692	1,299	1,183	1,910	8,167
2002	[e]	159	133	3,732	2,194	3,394	2,699	12,152

[a] Species composition estimated at 75% chum, 10% pink, 10% sockeye and 5% chinook and coho combined.

[b] Data collected from returned catch calendars. Due to low return of calendars and absence of household surveys, the resultant catches are incomplete and not comparable to past years.

[c] Surveys not conducted.

[d] Survey conducted by Subsistence Division and contacted 15 of 43 households in Brevig Mission.

[e] Harvest estimate from Div. of Subsistence survey.

Appendix Table B2. Comparative sockeye salmon aerial survey indices, Port Clarence District, 1963-2002.

Year	Salmon Lake	Grand Central River	Total
1963	866	620	1,486
1964 [a]	76	590	666
1965	250	160	410
1966	1,120	370	1,490
1967	129	280	409
1968 [a]	830	645	1,475
1969	24	171	195
1970 [b]	-	-	-
1971	538	512	1,050
1972 [a]	680	300 [c]	980
1973	1,747	607	2,354
1974	820	-	820
1975	537	123	660
1976	132	22	154
1977	317	235	552
1978	822	280	1,102
1979	1,250	261	1,511
1980 [a]	512	175	687
1983	970	-	970
1984	445	30	475
1985	730	250	980
1986	2,125	160	2,285
1987	4,040	530	4,570
1988	1,195	6	1,201
1989	3,055	525	3,591
1990	2,834	926	3,760
1991	3,790	1,570	5,360
1992	1,500	[b]	1,500
1993	2,885	216	3,092
1994	3,740	1,230	4,970
1995	5,433	628 [d]	6,061
1996	6,610	770	7,380
1997	8,760	1,520	10,280
1998	5,210	1,977	7,187
1999	31,720	1,780	33,500
2000	12,772	[b]	12,772
2001	9,400	155	9,555
2002	3,520	71	3,591

[a] Poor survey.

[b] No survey made.

[c] Boat survey.

[d] Early count.

Appendix Table C1. Kotzebue District chum salmon catch and dollar value, 1962-2002.

Year	Total Catch	Number [a] Fishermen	Season Catch per Fisher	Gross Value of [b] Catch to Fishers
1962	129,948	84	1,547	$4,500
1963	54,445	61	893	$9,140
1964	76,449	52	1,470	$34,660
1965	40,025	45	889	$18,000
1966	30,764	44	699	$25,000
1967	29,400	30	980	$28,700
1968	30,212	59	512	$46,000
1969	59,335	52	1,141	$71,000
1970	159,664	82	1,947	$186,000
1971	154,956	91	1,703	$200,000
1972	169,664	104	1,631	$260,000
1973	375,432	148	2,537	$925,000
1974	627,912	185	3,394	$1,822,784
1975	563,345	267	2,110	$1,365,648
1976	159,796	220	726	$580,375
1977	195,895	224	875	$1,033,950
1978	111,494	208	536	$575,260
1979	141,623	181	782	$990,263
1980	367,284	176	2,087	$1,446,633
1981	677,239	187	3,622	$3,246,793
1982	417,790	199	2,099	$1,961,518
1983	175,762	189	930	$420,736
1984	320,206	181	1,769	$1,148,884
1985	521,406	189	2,759	$2,137,368
1986	261,436	187	1,398	$931,241
1987	109,467	160	684	$515,000
1988	352,915	193	1,829	$2,581,333
1989	254,617	165	1,543	$613,823
1990	163,263	153	1,067	$438,044
1991	239,923	142	1,690	$437,948
1992	289,184	149	1,941	$533,731
1993 [c]	73,071	114	641	$235,061
1994 [d]	153,452	109	1,408	$233,512
1995	290,730	92	3,160	$316,031
1996 [e]	82,110	55	1,493	$56,310
1997	142,720	68	2,099	$187,978
1998	55,907	45	1,242	$70,587
1999	138,605	60	2,310	$179,781
2000	159,802	64	2,497	$246,786
2001 [f]	211,672	66	3,207	$322,650
Average	214,223	127	1,646	$660,951
2002	8,390	3	2,797	$7,572

a During 1962-1966 and 1968-1971 figures represent the number of vessels licensed to fish in the Kotzebue District, not the number of fishermen.

b Some estimates between 1962 and 1981include only chum value which in figures represent over 99% of the total value. Figures after 1981 represent the chum value as well as incidental species such as Dolly Varden, whitefish and other salmon.

c Includes 2,000 chum salmon and $3,648 from the Sikusuilaq springs Hatchery terminal fishery.

d Includes 4,000 chum salmon commercially caught but not sold on July 29.

e Includes 2,200 chum salmon commercially caught but not sold on July 29.

f Includes 10 chum salmon commercially caught but not sold on July 16.

Information Prior to 1997 From Regional Information Report no. 3A97-30

Year	Chum Salmon Cases (48lbs)	Chum Salmon Fresh Frozen (Round weight in pounds)	Other [a]	Fresh Frozen Salmon Roe (pounds)	Cured Pounds
1962	14,500				
1963	5,396				
1964	5,421	202,993			
1965	1,929	207,350			
1966		310,716		13,600	3,065
1967		273,420			11,488
1968		288,500			11,850
1969		455,013			8,183
1970		1,240,000			48,377
1971		1,264,753			27,542
1972		1,547,041			55,376
1973		3,416,431			144,768
1974		5,361,130 [b]			
1975		4,877,313 [c]			
1976		1,415,549	487		
1977		1,846,340	1,075		
1978		1,009,121	32,419		
1979		1,236,429	6,155		
1980		3,160,948	7,828		
1981		6,139,518	2,210		
1982		3,833,051	790	100	
1983		1,647,160	2,449		
1984		2,631,582	1,593		
1985		4,528,379	1,106		
1986		2,271,320	1,691		
1987		900,405	597		
1988		3,060,292	2,120		
1989		2,163,174	1,426		
1990		1,453,040	538		
1991		1,951,041	714		
1992		2,397,302	2,714		
1993 [d]		613,968	1,507	1,000	
1994 [e]		1,166,494	73		
1995		2,329,898	93		
1996 [f]		97,510	51		
1997		1,141,741	649		
1998		447,256	2,971		
1999		1,108,898	87		
2000		1,370,637	106		
2001		1,847,361	64		
2002		74,341	0		

[a] Chinook and pink salmon and Dolly Varden.

[b] Includes 36,775 pounds from the experimental commercial fishery at Deering.

[c] Includes 80,801 pounds from the experimental commercial fishery at Deering.

[d] Includes 11,160 pounds from the Sikusuilaq Springs Hatchery terminal fishery. Pounds of roe stripped are from a verbal report.

[e] Includes 31,500 pounds commercially caught but not reported on fish tickets.

[f] Includes 17,600 pounds commercially caught but not sold on fish tickets.

Appendix Table C3. Kotzebue District mean prices paid per pound to salmon fishers by species, 1962-2002.

Year[a]	Chum Salmon Average Weight	Chum Salmon Average Price	Chinook Salmon	Pink Salmon	Inconnu	Dolly Varden
1962		$0.35 [c]				
1963		$0.35 [c]				
1964	8.3	$0.45 [c]				
1965	9.0	$0.45			$1.30 [c]	
1966	10.1	$0.11			$1.40 [c]	$0.55
1967	9.3	$0.11			$1.50 [c]	$0.75
1968	9.7	$0.14			$0.91 [c]	$0.98
1969	7.5	$0.15			$1.30 [c]	$2.84
1970	8.1	$0.15				
1971	8.1	$0.16			$0.16	$0.17
1972	9.1	$0.17			$0.20	$0.17
1973	9.1	$0.25			$0.30	$0.16
1974 [b]	8.5	$0.34			$0.30	$0.16
1975 [b]	8.6	$0.28			$0.30	$0.30
1976	8.9	$0.41			$0.30	$0.30
1977	9.6	$0.56			$0.30	
1978	9.1	$0.57			$0.30	$0.25
1979	8.8	$0.80				$0.25
1980	8.6	$0.46			$0.10	$0.20
1981	9.1	$0.53			$0.75	$0.17
1982	9.3	$0.51	$1.25	$0.15	$0.75	$0.20
1983	9.4	$0.25	$1.08	$0.13		$0.20
1984	8.2	$0.44	$1.03			$0.25
1985	8.7	$0.47	$1.25			$0.25
1986	8.7	$0.41	$1.25			$0.20
1987	8.2	$0.57	$1.25			$0.30
1988	8.7	$0.85	$1.98			$0.35
1989	8.5	$0.28	$1.72			$0.28
1990	8.9	$0.31	$2.00			$0.25
1991	8.1	$0.22	$1.64		$0.50	$0.18
1992	8.3	$0.22	$1.89		$0.58	$0.10
1993	8.5	$0.38	$2.37		$0.50	$0.10
1994	7.8	$0.20	$1.14			$0.17
1995	8.0	$0.13	$1.00		$0.50	$0.20
1996	8.0	$0.09	$1.00		$0.44	$0.25
1997	8.0	$0.16	$1.02			$0.20
1998	8.0	$0.15	$1.00			$0.20
1999	8.0	$0.16	$1.00			$0.20
2000	8.6	$0.18	$1.00			$0.20
2001	8.7	$0.17	$1.00			
2002	8.9	$0.10				

[a] Information not available for some species in some years.

[b] Includes price paid to fishermen of Deering during the experimental commercial fishery.

[c] Price per fish.

Appendix Table C4 Ketchikan District commercial and subsistence salmon catches, 1914-2002.

	Commercial Catch			Subsistence Chum Catch			
Year [a]	Chum [b]	Other [b]	Total	Chum	Number of Fishermen Interviewed	Average Catch per Fisherman	Total Documented Catch
1914	8,550		8,550				
1915	4,750		4,750				
1916	19,000		19,000				
1917	44,612		44,612				
1918	27,407		27,407				
1957				298,430 [c]			
1960	129,948	27	129,975	70,280	81	868	200,250
1961	58,445	143	58,588	37,069	67	464	95,657
1964	96,400	5	96,504	20,702	28	513	106,269
1965	40,034		40,034	30,300	89	340	70,334
1966	30,764	1	30,765	35,588	121	294	66,353
1967	29,400		29,400	40,108	135	297	69,508
1968	30,284 [d]		30,284	20,814	65	320	51,198
1969	59,555	48	59,603	29,812	99	301	89,195
1970	159,664		159,664	28,486	164	174	188,150
1971	154,956	1	154,957	23,959	152	158	178,916
1972	169,664	1	169,665	13,885	96	145	183,550
1973	275,432	5	275,437	18,942	101	188	294,379
1974	634,479 [e]	48	634,527	26,729	88	304	661,256
1975	563,682 [e]	36	563,718	27,605	93	297	591,323
1976	159,796	2	159,798	15,765	91	173	175,563
1977	195,895		195,895	9,772	83	117	205,667
1978	131,494	7,007	138,501	12,864	85	151	151,365
1979	141,423	910	142,333	14,905	97	153	157,238
1980	367,259	1,654	368,913	19,949	111	179	388,862
1981	677,559	237	677,796	17,756	91	295	695,552
1982	417,790	57	417,847	30,133	204	148	447,980
1983	175,702	229	175,931	8,252 [f]	46	180	184,183
1984	320,206	107	320,313	15,508 [g]	66	235	335,821
1985	521,456	69	521,525	12,494 [h]	243	56	534,019
1986	261,456	108	261,564	36,281	827	43	297,845
1987	109,467	44	109,511	i	i	i	109,511
1988	352,913	112	353,025	i	i	i	353,025
1989	254,617	87	254,704	i	i	i	254,704
1990	169,261	32	169,293	i	i	i	169,293
1991	239,923	44	239,967	i	i	i	239,967
1992	289,164	224	289,388	i	i	i	289,388
1993	75,071 [j]	131	75,202	i	i	i	75,202
1994	153,452 [k]	2	153,454	36,226 [l]	375	97	189,680
1995	290,720	5	290,725	102,880	393	261	393,605
1996	92,110 [m]	3	92,113	89,740	896	167	181,853
1997	142,720	45	142,765	57,906	930	139	200,671
1998	55,907	210	56,117	48,979	892	93	105,096
1999	189,120	5	189,125	84,342	833	267	273,467
2000	159,802	10	159,812	65,975	422	536	225,787
2001	211,672	5	211,678	40,232	408	123	251,910
2002	8,190	0	8,190	15,169	191	79	23,359
1976-2000 Average	243,309	189	243,498	1994-2001 Average	59,410	484	147

[a] There was no commercial fishing during 1915-1961.

[b] Catches for 1914-1918 are from pack data only. Number of chum salmon retained is 9.3 per case (648) and 24 per barrel.

[c] Includes pink, chinook, and sockeye salmon.

[d] Reinstated mean annual catches prior to 1957 (study by Kubagis).

[e] Corrected from 1968 annual report due to addition of late catches.

[f] Includes 6,347 chum salmon from the Deering experimental fishery.

[g] Includes 10,704 chum salmon from the Deering experimental fishery.

[h] Partial survey.

[i] Does not include harvest from the villages of Neetuk and Klawock.

[j] Not surveyed.

[k] Includes 2,000 chum salmon from the Sikanaliey Springs Hatchery terminal fishery.

[l] Includes 4,300 chum salmon commercially harvested on August 5 but not sold.

[m] Includes 2,200 chum salmon commercially harvested on July 29 but not sold.

[n] Does not include the town of Ketchikan.

Appendix Table C5. Kotzebue District subsistence chum salmon catches by village, 1962-2002.

Year	Village					Kobuk River Villages	Noatak Village	Village						District Total
	Noorvik	Kiana	Ambler	Shungnak	Kobuk			Kotzebue	Deering	Kivalina	Buckland	Candle	Shishmaref	
1962	15,934	3,139	[b]	[b]	2,321	21,394	48,890	[b]	[b]	[b]	[b]	[b]	[b]	-
1963	4,304	1,973	755	1,240	200	8,472	16,762	5,835	[b]	[b]	[b]	[b]	[b]	-
1964	2,167	783	2,142	3,134	1,020	9,246	12,763	7,753	[b]	[b]	[b]	[b]	[b]	29,762
1965	5,596	1,598	1,340	2,160	877	11,571	5,671	8,058	5,200	[b]	[b]	[b]	[b]	30,500
1966	3,141	433	912	899	625	6,010	19,700	3,640	6,238	[b]	[b]	[b]	[b]	35,588
1967	2,350	1,489	679	1,500	175	6,193	26,512	4,032	3,098	[b]	162	11	100	40,108
1968	2,424	2,488	457	1,600	1,030	7,999	5,490	4,324	2,638	[b]	37	89	37	20,814
1969	1,301	2,458	3,525	2,550	1,655	11,489	14,458	1,768	1,897	[b]	-	200	-	29,812
1970	6,077	3,457	2,899	3,450	600	16,483	4,120	6,814	1,242	[b]	344	113	-	29,116
1971	7,144	5,177	2,299	2,653	1,931	19,204	9,919	1,737	763	[b]	155	50	131	31,959
1972	1,744	1,435	1,469	2,665	2,119	9,432	741	1,151	369	[b]	59	113	29	11,894
1973	2,312	4,470	1,529	4,406	1,917	14,634	216	1,172	1,098	[b]	1,722	50	100	18,992
1974	6,809	2,726	1,651	6,243	2,251	19,680	4,330	[b]	1,880	[b]	639	15	200	26,744
1975	4,620	4,320	3,390	9,060	1,755	23,145	1,515	[b]	1,175	[b]	1,540	[b]	230	27,605
1976	1,555	1,579	2,000	4,213	562	9,909	4,448	[b]	1,358	[b]	[b]	[b]	[b]	15,715
1977	891	766	385	1,760	325	4,127	2,125	[b]	3,500	[b]	[b]	[b]	[b]	9,752
1978	2,034	1,493	2,224	4,766	852	11,369	1,495	[b]	[b]	[b]	[b]	50	[b]	12,914
1979	2,155	1,225	2,400	2,947	651	9,378	2,227	[b]	2,000	[b]	1,000	[b]	[b]	14,605
1980	2,229	2,551	660	2,704	350	8,494	2,135	[b]	[b]	[b]	[b]	[b]	[b]	10,629
1981	3,488	1,439	782	2,800	950	9,459	5,465	2,387	295	110	50	[b]	[b]	17,766 [a,c]
1982	7,433	4,918	2,506	4,191	600	19,648	5,479	4,099	807	210	[b]	[b]	[b]	30,243 [a]
1983 [a,d]	277	223	1,062	3,556	368	5,486	4,035	347	219	200	[b]	[b]	[b]	10,287
1984 [a,e]	[b]	[b]	2,990	4,241	[b]	7,231	6,049	88 [a]	1,540	200	[b]	[b]	[b]	15,508
1985	7,015	3,494	3,487	3,115	300	17,411	[b]	13,494	573	[b]	[b]	[b]	[b]	31,478
1986	8,418	[b]	[b]	4,483	[b]	12,901	1,246	36,311	[b]	[b]	[b]	[b]	[b]	-
1987	5,092	[b]	[b]	1,975	[b]	7,067	2,921	[b]	[b]	[b]	[b]	[b]	[b]	-
1988	7,500	[b]	[b]	6,223	[b]	13,723	[b]	[b]	[b]	[b]	[b]	[b]	[b]	13,723
1989	[b]	[b]	[b]	3,894	[b]	3,894	1,595	[b]	[b]	[b]	[b]	[b]	[b]	5,489
1990	4,353	[b]	[b]	[b]	[b]	4,353	3,915	[b]	[b]	[b]	[b]	[b]	[b]	8,268
1991	6,855	[b]	[b]	4,248	[b]	11,103	3,637	[b]	[b]	[b]	[b]	[b]	[b]	14,740
1992	8,370	[b]	[b]	3,890	[b]	12,260	2,043	[b]	[b]	[b]	[b]	[b]	[b]	14,303
1993	8,430	[b]	[b]	3,730	[b]	12,160	3,270	[b]	[b]	[b]	[b]	[b]	[b]	15,430
1994	8,157	1,891	2,860	7,982	5,722	26,612	6,126	[b]	3,488	[b]	[b]	[b]	[b]	36,226
1995	15,485	5,985	8,558	5,880	2,959	38,867	6,359	50,708	[b]	[b]	[b]	[b]	6,947	102,881
1996	13,611	5,935	9,062	8,649	1,819	39,076	10,091	50,573	[b]	[b]	[b]	[b]	[b]	99,740
1997	14,323	3,064	2,713	5,513	629	26,242	5,309	26,355	[b]	[b]	[b]	[b]	[b]	57,906
1998	9,845	3,414	2,432	4,676	1,031	21,398	2,614	24,968	[b]	[b]	[b]	[b]	[b]	48,980
1999	17,843	3,788	590	3,868	1,869	27,958	1,616	64,768	[b]	[b]	[b]	[b]	[b]	94,342
2000	10,391	2,876	5,009	2,944	318	21,538	7,293	37,144	[b]	[b]	[b]	[b]	[b]	65,975
2001	16,540	5,500	[b]	4,310	2,843	29,193	2,326	17,713	[b]	[b]	[b]	[b]	[b]	49,232
2002	13,943	[f]	[f]	[f]	[f]	[f]	2,937	[f]	[b]	[b]	[b]	[b]	[b]	16,880

[a] No household survey, information is from return of mail questionaires.

[b] Not surveyed.

[c] Does not include 310 chum salmon taken in Selawik.

[d] Household surveys were conducted in Noatak, Kivalina, and Shungnak only. Other harvest information is from limited return of mail-in calendars.

[e] Household surveys were conducted in Noatak, Kivalina, Ambler, and Deering. Other harvest information is from limited return of mail-in questionaires

[f] The Kotzebue Sound communities of Ambler, Kiana, Kobuk, Kotzebue, and Shungnak, though normally included, were not surveyed in 2002.

Appendix Table C6. Kotzebue District mean subsistence chum salmon catch per fisher by village, 1962-2002.

Year	Kotzebue	Noatak	Noorvik	Kiana	Ambler	Shungnak	Kobuk	Deering
1962	[a]	1190	665	350	[a]	[a]	335	[a]
1963	650	800	160	[b]	94	[b]	67	[a]
1964	515	710	220	260	310	[a]	205	[a]
1965	400	810	220	265	190	220	145	[a]
1966	158	820	137	62	76	45	104	[a]
1967	202	914	90	68	49	125	35	[a]
1968	135	220	84	96	33	114	206	[a]
1969	98	760	163	223	235	318	206	[a]
1970	187	242	132	138	242	182	150	[a]
1971	53	148	223	207	177	133	386	[a]
1972	63	74	84	84	244	266	302	[a]
1973	195	36	121	178	305	489	273	[a]
1974	[a]	393	324	181	165	891	450	[a]
1975	[a]	138	210	288	282	647	293	[a]
1976	[a]	212	259	79	250	281	70	[a]
1977	[a]	425	56	38	55	104	41	[a]
1978	[a]	79	88	71	131	265	142	[a]
1979	[a]	114	98	68	160	184	108	[a]
1980	[a]	164	318	213	132	246	88	[a]
1981	213	579	388	131	129	233	317	[a]
1982	84	189	323	246	167	262	200	81
1983 [c]	50	269	139	223	531	254	368	44
1984	44	173	[a]	[a]	214	303	[a]	194
1985	107	[a]	206	116	152	195	50	72
1986	47	69 [d]	271	[a]	[a]	195	[a]	[a]
1987	[a]	225 [d]	189	[a]	[a]	329	[a]	[a]
1988	[a]	[a]	300	[a]	[a]	389	[a]	[a]
1989	[a]	133	[a]	[a]	[a]	216	[a]	[a]
1990	[a]	135	198	[a]	[a]	[a]	[a]	[a]
1991	[a]	145	311	[a]	[a]	283	[a]	[a]
1992	[a]	89	310	[a]	[a]	243	[a]	[a]
1993	[a]	136	312	[a]	[a]	196	[a]	[a]
1994 [e]	[a]	90	133	32	99	154	260	92
1995	71	69	123	59	110	111	110	[a]
1996	73	115	117	58	111	154	76	[a]
1997	41	71	125	35	39	117	28	[a]
1998	35	27	79	34	30	84	41	[a]
1999	77	115	151	42	28	76	81	[a]
2000	54	72	95	33	71	64	10	[a]
2001	23	24	152	62	[a]	94	109	[a]
2002	[a]	29	124	[a]	[a]	[a]	[a]	[a]

[a] Not Surveyed.

[b] Number of fishers not known.

[c] Estimates based on very limited number of mail-in calendars except for the villages of Noatak and Shungnak where interviews were conducted.

[d] Partial harvest, people were just beginning to fish.

[e] Preliminary information based on interviews conducted by Division of Subsistence.

Appendix Table C7. Chum salmon aerial survey counts for the Kotzebue District, 1962-2002. (Page 1 of 5)

Stream[a,b]	1962	1963	1964	1965	1966	1967	1968	1969	1970
Noatak Drainage									
Noatak River below Kelly River	168,000 [d]	1,970 [b,j]	89,798	6,152 [b,j]	101,640	29,120 [b]	39,394	33,945	
Eli River	9,080 [d]	35			120		5,502 [f]	68 [f]	138,145
Kelly River & Lake	1,818 [d]	600		3,155	570	225	375	150	
Noatak River System Total	178,898	2,605	89,798	9,307	102,330	29,345	45,271	34,163	
Kobuk Drainage									
Kobuk to Pah River		400		1,750	266		530		
Pah River to just below Selby River		1,530		500			50		1,753
Selby River mouth & Slough		1,045		500	630	1,625	70		20
Selby R. mouth to Beaver C.		1,095				75	170		4,820
Beaver Creek mouth					460	795	1,550		2,385
Above Beaver Creek		465			118				4,930
Upper Kobuk River Total	9,224 [d]	4,535	7,985 [b]	2,750	1,474	2,495	2,370	7,500 [e]	
									13,908
Squirrel River	5,834 [d]	2,200	8,009	7,230	1,350	3,332	6,746	6,714	
Salmon River	12,936 [d]	1,535	9,353	1,500 [b]	3,957	2,116	3,367	2,561	4,418
Tutuksuk River	10,841 [d]	670	2,685		1,383	169	823 [b]	159	3,000 [b]
									2,000 [b]
Kobuk River System Total	38,835 [c]	8,940	28,032	11,480	8,164	8,112 [c]	13,306	16,934	

(continued)

Appendix Table C7. (Page 2 of 5)

Stream[a,b]	1971	1972 [b]	1973 [b]	1974	1975	1976	1977 [b]	1978	1979
Noatak Drainage									
Noatak River below Kelly River	41,056	64,315	32,144	129,640	96,509	44,574	11,221	37,817	15,721 [b]
Eli River		3,286		22,249	1,302	1,205	742	5,525	1,794
Kelly River & Lake			2,590 [c]	1,381 [c]	3,937	217 [b]	290 [b]	168 [b]	3,200 [b]
Noatak River System Total	41,056	64,315 [b]	34,734	153,270	101,748	45,996	12,253 [b]	43,510	20,715
Kobuk Drainage									
Kobuk to Pah River	4,953			2,255	1,873	485		269	75
Pah River to just below Selby River	2,039	1,865		1,710	3,968	2,037		1,448	183
Selby River mouth & slough	3,490	7,400		7,380				211	1,110
Selby R. mouth to Beaver C.	4,720	3,170	920	13,775 [b]	4,861 [c]			53	640
Beaver Creek mouth	2,000	3,000	850						
Above Beaver Creek		2,720	700						
Upper Kobuk River Total	17,202	18,155	2,470 [b]	28,120	10,702	2,522 [b]		1,981 [b]	2,008
Squirrel River	6,628	32,126	12,345	32,523	32,256	7,229	1,964 [b]	1,863 [b]	1,500 [b]
Salmon River	5,453	2,073 [b]	6,891	29,190	9,721	1,161		814 [b]	674 [b]
Tutuksuk River	1,384 [c]			8,312	1,344 [b]	758		368 [b]	382 [b]
Kobuk River System Total	30,667	52,354	21,706	98,145	54,023	11,670	1,964	5,026	4,564

(continued)

Appendix Table C7. (Page 3 of 5)

Stream[a,b]	1980	1981 [b]	1982 [b]	1983	1984	1985 [b]	1986 [b]	1987 [b]	1988 [b]
Noatak Drainage									
Noatak River below Kelly River	164,474	116,352	20,682	79,773	67,873	45,525	37,227	5,515 [c]	45,930 [c]
Eli River	10,277		189	3,044	5,027	855	4,308	2,780	8,639
Kelly River & Lake	7,416	13,770	11,604	12,137	3,499	1,200	839	950	1,460
Noatak River System Total	182,167	130,122	32,475	94,954	76,399	47,580	42,374	9,245	56,029
Kobuk Drainage									
Kobuk to Pah River	1,694	18	2,643 [b]	2,147	402	2,048 [b]	531		
Pah River to just below Selby River	2,069	309	598 [b]	2,433	257	241 [b]	511	2,250	1,135 [b]
Selby River mouth & slough		8,321 [c]	2,454	11,683		711 [b]	673	1,470	820 [b]
Selby R. mouth to Beaver C.	6,925 [b]		7,268	13,011	5,910	3,278 [b]	3,282	1,350	6,890 [b]
Beaver Creek mouth	784		1,711	3,059					
Above Beaver Creek				1,413	4,052		1,018	3,140	3,050 [b]
Upper Kobuk River Total	11,472	8,648	14,674	33,746	10,621	6,278	6,015	8,210	11,895 [b]
Squirrel River	13,563	9,854	7,690	5,115	5,473	6,160	4,982	2,708 [c]	4,848 [b]
Salmon River	8,456	4,709	1,821 [c]	1,677	1,471	2,884	1,971	3,333	6,208
Tutuksuk River	1,165	1,114	1,322	2,637	1,132	5,098	4,257	206	3,122
Kobuk River System Total	34,656	24,325	25,507	43,175	18,697	20,420	17,225	14,457	26,073

(continued)

Stream[a,b]	1989 [c]	1990 [b]	1991	1992 [b]	1993	1994 [c]	1995	1996	1997
Noatak Drainage									
Noatak River below Kelly River		23,345 [b]	82,750	34,335	25,415		147,260	306,900	[c]
Eli River		3,000	2,940	701	4,795		7,860	30,040	[c]
Kelly River & Lake		325 [c]	654	726	9		8,384	1,427	2,792
Noatak River System Total		26,670	86,344	35,762	30,219		163,504	338,367	
Kobuk Drainage									
Kobuk to Pah River		4,610	9,840	1,030	3,896		12,190	20,700	2,248 [b]
Pah River to just below Selby River		305	2,780	3,820	1,535		4,537	4,600	404 [b]
Selby River mouth & slough		420	1,040	1,500	1,800		1,250	4,100	662 [b]
Selby River		7,505	1,460	868	824		3364	14,950	853 [b]
Selby R. mouth to Beaver C.			5,250	3,845	929		10,898	15,480	2,582 [b]
Beaver Creek mouth		2,515							914 [b]
Above Beaver Creek			4,155	740	3,174		3,486	14,940	850 [b]
									[b]
Upper Kobuk River Total		15,355	24,525	11,803	12,158		35,725	74,770	8,513 [b]
Squirrel River		5,500	4,606	2,765	4,463		10,605	10,740	4,779 [b]
Salmon River		6,335	5,845	1,345	13,880		13,988	23,790	1,181 [b]
Tutuksuk River		2,275	744	1,162	1,196		3,901	21,805	163 [b]
Kobuk River System Total		29,465	35,720	17,075	31,697		64,219	131,105	

(continued)

Stream[a,b]	1998	1999	2000 [k]	2001	2002	Aerial Escapement Goals
Noatak Drainage						
Noatak River below Kelly River	[b]				700	
Eli River	[b]					
Kelly River & Lake	2,631				1,116	
Noatak River System Total	[b]	84,085				84,000
Kobuk Drainage						
Kobuk to Pah River	[b]			2,790		
Pah River to just below Selby River	[b]			1,380	850	
Selby River mouth & slough	[i]			1,780	2,100	
Selby River	730					
Selby R. mouth to Beaver C.	[b]			1,430		
Beaver Creek mouth	[b]					
Above Beaver Creek	[b]				490	
	[b]					
Upper Kobuk River Total	[b]	27,340		13,420	3,447	10,000
Squirrel River	[b]	13,513				11,500
Salmon River	[b]	4,989				7,000
Tutuksuk River	[b]	2,906				2,000
Kobuk River System Total		48,748				30,500

[a] Three aerial surveys are attempted yearly at different intervals for each tributary to assess escapements prior to the peak, at the peak and after the peak of the run. Indices listed in this table are the largest survey observed for each tributary during the given year.

[b] Poor survey conditions or incomplete, early or late survey.

[c] Survey by foot or boat.

[d] These fish are unidentified salmon, mostly chums.

[e] This figure includes fish observed from just above Selby Slough to the mouth of the Reed River.

[f] Unresolvable discrepancies in historical data put this figure in question.

[g] Unclear where these fish were observed.

[h] The figures in this table have been corrected and supercede figures in previous reports.

[i] Surveyed well before peak of migration.

[j] Unacceptable conditions.

surveys flown in 2000.

Appendix Table D1. Norton Sound herring and spawn-on-kelp harvests (in tons) by U.S. commercial fishers, 1909-2002.

Year	Sac Roe Herring	Food or Bait Herring	Total	Spawn on Kelp
1909-1916[a]	-	-	-	-
1916-1928	-	1,881	1,881	-
1929	-	166	166	-
1930	-	441	441	-
1931	-	86	86	-
1932	-	529	529	-
1933	-	31	31	-
1934	-	4	4	-
1935	-	15	15	-
1936	-	-	-	-
1937	-	6	6	-
1938	-	10	10	-
1939	-	6	6	-
1940	-	14	14	-
1941	-	3	3	-
1942-1963	-	-	-	-
1964	20	-	-	-
1965	-	-	-	-
1966	12	-	-	-
1967	-	-	-	-
1968	-	-	-	-
1969	2	-	-	-
1970	8	-	-	-
1971	20	-	-	-
1972	17	-	-	-
1973	35	-	-	-
1974	2	-	-	-
1975	-	-	-	-
1976	9	-	-	-
1977	11	-	-	trace
1978	15	-	-	4
1979	1,292	-	-	13
1980	2,451	1	2,452	24
1981	4,371	-	-	47[b]
1982	3,864	69	3,933	38
1983	4,181	401	4,582	29[c]
1984	3,298	274	3,572	19[d]
1985	3,420	128	3,548	-[e]
1986	4,926	268	5,194	-
1987	3,779	303	4,082	-
1988	4,256	416	4,672	-
1989	4,494	247	4,741	-
1990	5,253	1,026	6,279	-
1991	5,465	207	5,672	-
1992[f]	-	-	-	-
1993	4,713	321	5,034	-
1994	958	2	960	-
1995	6,647	116	6,763	-
1996[g]	6,061	109	6,220	-
1997[h]	3,709	262	3,976	-
1998	2,623	8	2,631	9[i]
1999	2,693[j]	53	2,761	4
2000	4,487[k]	-	4,487	2
2001	2,245	-	2,245	2
2002	1,059	64	1,123	-

[a] Fishery occurred some years, but harvest unavailable. Fishery from 1909-1941 occurred near Golovin; 1964 to present has occurred in southeast Norton Sound.

[b] Does not include approximately 6 st of wastage.

[c] Does not include approximately 2 st of wastage.

[d] Includes 3 st of spawn on Macrocystis kelp.

[e] All spawn-on-kelp fisheries closed by regulation prior to the 1985 season.

[f] No commercial fishery took place in 1992.

[g] Total includes an estimate 20 st of wastage.

[h] Total includes an estimate 5 st of wastage. Includes approximately 1,000 lbs taken as bait under 5 AAC 27.971.

[i] Includes 2,100 lbs of wild kelp and 16,083 pounds of *Macrocystis* kelp.

[j] Includes an estimate 5 st of wastage.

[k] Includes an estimate 15 st of wastage.

Appendix Table D2. Japanese gillnet herring catches in Norton Sound, 1968-1977. (North of 63 N. Latitude and East of 167 W. Longitude)

Year	Gillnet Catch (st)	Remarks
1968	131	First foreign effort on herring in Norton Sound
1969	1,400	Peak catch with large effort (about 40 ships). Two vessels apprehended.
1970	69	
1971	703	
1972	15	
1973	38	
1974	764	
1975	-	
1976	-	Data unavailable.
1977	-	Herring fishery closed to foreign nations.
Total	3,120	Excludes 1976 catches.

Appendix Table D3. Commercial herring fishery summary information, Norton Sound District, 1979-2002.

Year	Est. biomass (tons)	Catch Gillnet (tons)	Beach Seine (tons)	Wild *Macrocystis* Kelp (tons)	Kelp (lbs.)	No. of Fishermen	Dollar Value (millions)	No. of Buyers	Average Roe %	Peak Catch day [a]	Fishery Duration
1979	7,700	1,292	0	13		67	0.6	7	7.0	25-May	19-May/14-June
1980	8,400	2,452	0	24		294	0.5	8	8.1	30-May	21-May/5-June
1981	25,100	4,371	0	47		332	1.5	13	8.8	24-May	18-May/28-May
1982	19,403	3,933	0	38		237	1.0	7	8.8	8-Jun	3-Jun/11-Jun
1983	28,100	4,541	41	29		272	1.4	9	8.6	23-May	18-May/28--May
1984	23,100	3,245	327	16	6,000	194	0.9	8	10.3	10-Jun	6-Jun/28-May
1985	20,000	3,379	169			277	1.4	11	9.9	20-Jun	13-Jun/21-Jun
1986	28,100	4,979	215			323	2.9	10	9.6	9-Jun	3-Jun/10-Jun
1987	32,370	3,759	323			564	2.6	11	8.6	7-Jun	7-Jun/8-Jun
1988	33,924	4,474	198			348	3.9	11	9.0	28-May	27-May/31-May
1989	25,981	4,351	390			357	2.3	9	9.2	28-May	27-May/30-May
1990	39,384	6,032	347			365	3.6	8	8.8	29-May	28-May/30-May
1991	42,854	5,150	522			279	2.4	8	9.3	25-May	23-May/25-May
1992	57,974	0 [b]	0 [b]				0.0			20-Jun	
1993	46,549	4,291	742			264	1.5	5	9.9	25-May	24-May/5-Jun
1994	31,088	921	40			215	0.3	6	10.3	8-Jun	5-Jun/9-Jun
1995	37,779	6,166	621			215	4.2	6	10.4	24-May	23-May/30-May
1996	26,596	5,581	589			287	4.5	10	10.6	25-May	24-May/25-May
1997	47,748	3,459	513			220	0.6	9	9.9	22-May	20-May/24-May
1998	52,033	2,632	0	1	16,083	47	0.2	2	9.2	25-May	22-May/9-Jun
1999	34,314	2,755	0		7,482	122	0.6	4	10.5	17-Jun	13-Jun/22-Jun
2000	32,680	4,390	81		4,500	97	0.8	4	9.5	11-Jun	7-Jun/15-Jun
2001	26,305	2,245	0		4,400	76	0.3	3	12.3	12-Jun	12-June/16-June

[a] Date of peak aerial survey biomass estimate, typically one or two days prior to peak catch.

[b] No fishery due to late sea ice breakup.

Appendix Table D4. Norton Sound commercial herring harvest (tons) by subdistrict, by year, 1979 - 2002.

	Subdistricts							
Year[a]	s.d. 1	s.d. 2	s.d. 3	s.d. 4	s.d. 5	s.d. 6	s.d. 7	Totals
1979	319	405	555	0	0	0	14	1,293
1980	1,176	632	632	5	0	7	0	2,452
1981	3,068	831	471	1	0	0	0	4,371
1982	2,062	946	925	0	0	0	0	3,933
1983	434	1,265	2,733	0	65	85	0	4,582
1984	-	-	3,572	0	0	0	0	3,572
1985	1,538	188	1,675	0	147	0	0	3,548 [b]
1986	2,559	-	2,450	0	185	0	0	5,194
1987	2,218	174	1,690	0	0	0	0	4,082
1988	3,260	99	1,307	0	6	0	0	4,672
1989	3,256	60	1,425	0	0	0	0	4,741 [c]
1990	4,498	950	931	0	0	0	0	6,379 [d]
1991	0	880	4,792	0	0	0	0	5,672 [e]
1992 [f]	0	0	0	0	0	0	0	0
1993	2,288	587	1,881	0	278	0	0	5,034 [g]
1994	250	36	634	0	40	0	0	960
1995	2,359	604	1,524	0	2,108	167	0	6,762
1996	3,074	111	2,831	0	153	0	0	6,170 [h]
1997	2,046	62	1,864	0	0	0	0.5 [j]	3,976 [i]
1998	1,543	0	1,081	0	0	0	0	2,624
1999	285	323	2,050	0	0	0	8	2,746 [k]
2000 [l]	2,623	81	1,767	0	0	0	0	4,471
2001 [i]	898	0	1,347	0	0	0	0	2,245
2002 [l]	373 [a]	0	750 [a]	0	0	0	0	1,123 [a]

[a] Includes herring taken for sac roe and bait.

[b] Does not include an estimated 90 st of wastage.

[c] Does not include an estimated wastage of 30 st in abandoned gillnets.

[d] Does not include an estimated wastage of 60 st in abandoned gillnets.

[e] Does not include an estimated wastage of 125 st in abandoned gillnets.

[f] No commercial fishery in 1992.

[g] Does not include an estimated wastage of 45 st in abandoned beach seine sets.

[h] Does not include an estimated 50 st of wastage.

[i] Does not include an estimated 5 st of wastage.

[j] Approximately 1000 lbs of herring bait was taken under 5AAC 27.971 in June (not during sac roe fishery).

[k] 75.8 tons added to sac roe total due to dewatering by buyers. 3 tons added to bait total due to dewatering by buyer. Does not include an estimated 5 st of wastage.

[l] 10% added to sac roe total due to dewatering by buyers.

Appendix D5. Port Clarence District commercial herring fishing history.

Year	Fishery	Effort	Harvest	Price	Value
1986	Fall Bait	1 Permit (G/N)	130 lbs.	$1.00/lb	$ 130
1987	Sac Roe	3 Purse Seiners 3 Gillnetters	145.5 st	$800/st@10%	$ 77,466
1987	Fall Bait	Unknown # of Permits (G/N)	1,100 lbs	$.30/lb	$ 330
1988	Sac Roe	3 Purse Seiners	56.4 st @7.6%		
		3 Gillnetters	23.6 st @8.9%		
		Combined Total	80.0 st @8.2%	$1000/st @10%	$ 57,500
1994	Fall Bait	4 Permits (G/N)	8,706 lbs	$.45/lb	$ 3,917
1995	Spring Bait	8 Permits (G/N)	19,193 lbs	$.61/lb	$ 11,625
	Fall Bait	2 Permits (G/N)	9,119 lbs	$.37/lb	$ 3,393
		Combined Total	28,312 lbs	$.53/lb	$ 15,018
1996	Spring Bait	4 Permits	5,546 lbs	$.40/lb	$ 2,218

Appendix Table E1. Historical commercial summer harvest of red king crab from Norton Sound Section, Eastern Bering Sea, by statistical areas, 1977-2002 (catch in pounds). (Page 1 of 2)

Statistical Area	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
616331	7,393												
616401													
626331	40,020					22							
626401	31,572			4,830	399								
626402	38,993												
636330													
636401				12,[illegible]63	61,823	32,246	5,[illegible]89	41	891				22,030
636402													
646301													
646330					4,[illegible]16								5,212
646491			155,972		1,319	15,[illegible]32							
646402	80,969					748							
656300			161,699		15,174								
656330			823,518	72,735	595,662	3,983	24,246	83,479	7,632		79,006	36,129	1,757
656401			138,011	121,147	253,387	60,480	11,422	183,119	246,200		194,408	165,644	100,956
656402	306,202	90,187	288,869	918	3,098	2,832			132,363				
666230		55,490			77								
666300		162,795	60,816	84,874	9,167	95		4,534					
666330		353,016	505,050	367,446	141,513	8,990	1,192		389	70,615	2,963	13,020	1,275
666401		179,212	486,947	205,400	381,510	79,580	325,045	116,254	5,341	408,848	50,744	21,895	115,257
666402	12,036	515,778	534,938	183,581		17,585			32,992				
666431			146,029										
676300		13,238		126,231									
676330		51,304	81,798	6,762	18,734								
676400		667,130	33,856	274	92,026	1,315	247		32				
676430		3,811	12,309		373	3,513			1,171				
676501					36								
686330			1,860										
Totals	517,787	2,091,961	2,931,672	1,186,596	1,379,014	228,921	368,032	387,427	427,011	479,463	327,121	236,688	246,487

-Continued-

Appendix Table E1. (Page 2 of 2)

Statistical Area	1990	1991[a]	1992	1993	1994	1995	1996[b]	1997	1998	1999	2000	2001	2002	Totals
616331					48					633	4,557		3,506	16,637
616401						35								35
626331							61						2,455	42,558
626401						18,971	45,045	18,066	8,065	508	4,688	61,620	53,722	247,487
626402														38,995
636330							4,560	3,838	2,449			2,253		13,100
636401			1,159	1,373	8,087	24,329	70,677	59,206	10,771	14,201	126,994	91,343	50,906	594,355
636402					1,754	3,466								5,220
646301						4,628	13,888							18,516
646330						1,493	2,894	314		3,021		1,868	1,955	21,473
646401				1,963	37,222	105,045	22,834	1,052	3,194	221		4,287		350,641
646402				730	143,511	66,821								292,779
656300														176,873
656330			4,814	265		19,745	15,446	1,651	4,078	1,301		20,869	12,374	1,111,699
656401	171		53,119	105,341	29,566	32,289	9,985	3,035	1,127	2,739	94,813	55,158	63,038	1,926,135
656402				193,079	106,033	44,000								1,167,791
666230														55,567
666300							25,319							347,800
666330	27,185		4,305	31,758		730					5,839	7,030	1,332	1,543,648
666401	162,263		10,632	746	396		3,001	1,510		930	60,762	43,771	35,970	2,696,320
666402				535	1,221								30,070	1,328,736
666431						1,124							4,274	151,427
676300							546							140,015
676330														158,598
676400	3,212						9,773							807,867
676430														21,177
676501														36
686330														1,860
Totals	192,831		74,029	335,790	527,858	322,676	224,231	92,988	29,684	23,553	312,524	288,199	259,602	13,277,275

[a] No commercial fishery occured in 1991.

[b] Does not include approximately 2,490 lbs not reported on fish tickets.

Appendix Table E2. Percentage of recruit and postrecruit male red king crab from summer commercial fishery catch samples Norton Sound Section, Eastern Bering Sea, 1977-2002.

Year	Recruits[a] %	Postrecruits[b] %
1977	53	47
1978	29	71
1979	33	67
1980	15	85
1981	10	90
1982	27	73
1983	55	45
1984	59	41
1985	45	55
1986	49	51
1987	22	78
1988	25	75
1989	23	77
1990	21	79
1991 [c]	-	-
1992	28	72
1993	31	69
1994	20	80
1995	36	64
1996	30	70
1997	49	51
1998	32	68
1999	42	58
2000	41	60
2001	33	67
2002	33	67

[a] Recruits = All new shell, legal size, male king crab of carapace length <116mm.

[b] Postrecruits = All other, legal size, male king crab.

[c] No Summer Commercial Fishery in 1991.

Appendix Table E3. Historical summer commercial red king crab fishery economic performance, Norton Sound Section, Eastern Bering Sea, 1977 - 2002.

Year	Guidline Harvest Level (lbs) [a]	Legal Male Pop. Est. No. crab (millions)	Legal Male Pop. Est. lbs [b]	Commercial Harvest (lbs) [a,b] Open Access	Commercial Harvest (lbs) [a,b] CDQ	Number of Vessels	Number of Permits	Number of Landings	Number of Pots Registered	Number of Pots Pulls	Exvessel Price/lb	Fishery Value (millions $)	Season Length Days	Season Length Dates
1977	[d]	1.7	5.1	0.52		7	7	13	[d]	5,457	0.75	0.229	60	[e]
1978	3.00			2.09		8	8	54	[d]	10,817	0.95	1.897	60	6/7-8/15
1979	3.00	0.8	2.4	2.93		34	34	76	[d]	34,773	0.75	1.878	16	7/15-7/31
1980	1.00	1.9	5.7	1.19		9	9	50	[d]	11,199	0.75	0.890	16	7/15-7/31
1981	2.50	1.2	3.6	1.38		36	36	108	[d]	33,745	0.85	1.172	38	7/15-8/22
1982	0.50	0.9	2.7	0.23		11	11	33	[d]	11,230	2.00	0.405	23	8/9-9/1
1983	0.30			0.37		23	23	26	3,583	11,195	1.50	0.537	3.8	8/1-8/5
1984	0.40			0.39		8	8	21	1,245	9,706	1.02	0.395	13.6	8/1-8/15
1985	0.45	1.1	3.3	0.43		6	6	72	1,116	13,209	1.00	0.427	21.7	8/1-8/23
1986	0.42			0.48		3	3	[d]	578	4,284	1.25	0.600	13	8/1-8/25 [f]
1987	0.40			0.33		9	9	[d]	1,430	10,258	1.50	0.491	11	8/1-8/12
1988	0.20	1.0	3.0	0.24		2	2	[d]	360	2,350	[d]	[d]	9.9	8/1-8/11
1989	0.20			0.25		10	10	[d]	2,555	5,149	3.00	0.739	3	8/1-8/4
1990	0.20			0.19		4	4	[d]	1,388	3,172	[d]	[d]	4	8/1-8/5
1991 [c]	0.34	1.3	3.9											
1992	0.34			0.07		27	27	[d]	2,635	5,746	1.75	0.130	2	8/1-8/3
1993	0.34			0.33		14	20	208	560	7,063	1.28	0.430	52	7/1-8/28 [g]
1994	0.34			0.32		34	52	407	1,360	11,729	2.02	0.646	31	7/1-7/31
1995	0.34			0.32		48	81	665	1,900	18,782	2.87	0.926	67	7/1-9/5
1996	0.34	0.5	1.5	0.22		41	50	264	1,640	10,453	2.29	0.519	57	7/1-9/3 [h]
1997	0.08			0.09		13	15	100	520	2,982	1.98	0.184	44	7/1-8/13 [h]
1998	0.08			0.03	0.00	8	11	50	360	1,639	1.47	0.041	65	7/1-9/3 [i]
1999	0.08	1.6	4.8	0.02	0.00	10	9	53	360	1,630	3.08	0.073	66	7/1-9/4 [i]
2000	0.33	1.4	4.2	0.29	0.01	14	17	202	560	6,345	2.29	0.715	91	7/1- 9/29 [k]
2001	0.30	1.3	3.8	0.28	0.00	30	37	320	1,200	11,928	2.31	0.674	97	7/1 - 9/9 [l]
2002	0.24	1.0	3.1	0.24	0.01	28	32	164	1,120	8,491	2.81	0.729	77	6/15-9/3 [m]

[a] Deadloss included in total.

[b] Millions of pounds.

[c] No summer commercial fishery.

[d] Information not available.

[e] Fishing actually began 8/12.

[f] Fishing actually began 7/8.

[g] Fishing began 7/9 due to fishermen's strike.

[h] First delivery was made 7/10.

[i] First delivery was made 7/16.

[j] The season was extended 24 hours due to bad weather.

[k] Open access fishery closed 8/29/00. CDQ fishery ran from 9/1/00 - 9/29/00

[l] Open access fishery closed 9/1/01. CDQ fishery ran from 9/1/01 - 9/9/01

[m] Open access fishery was open 7/1/02-8/6/02.
CDQ fishery was open 6/15/02-6/28/02 and 8/9/02 - 9/3/02.

Appendix Table E4. Winter commercial and subsistence red king crab harvests, Norton Sound Section, Eastern Bering Sea, 1978 - 2002.

Commercial			Subsistence						
Year[a]	Fishers	# Crab Harvested	Winter[b]	Permits Issued	Permits Returned	Permits Fished	Total Crab Caught[c]	Total Crab Harvested[d]	Average/ permit fished
1978	37	9,625	1977-78	290	206	149	*	12,506	84
1979	1	221	1978-79	48	43	38	*	224	6
1980	1	22	1979-80	22	14	9	*	213	24
1981	0	0	1980-81	51	39	23	*	360	16
1982	1	17	1981-82	101	76	54	*	1,288	24
1983	5	549	1982-83	172	106	85	*	10,432	123
1984	8	856	1983-84	222	183	143	15,923	11,220	78
1985	9	1,168	1984-85	203	166	132	10,757	8,377	63
1986	5	2,168	1985-86	136	133	107	10,751	7,052	66
1987	7	1,040	1986-87	138	134	98	7,406	5,772	59
1988	10	425	1987-88	71	58	40	3,573	2,724	68
1989	5	403	1988-89	139	115	94	7,945	6,126	65
1990	13	3,626	1989-90	136	118	107	16,635	12,152	114
1991	11	3,800	1990-91	119	104	79	9,295	7,366	93
1992	13	7,478	1991-92	158	105	105	15,051	11,736	112
1993	8	1,788	1992-93	88	79	37	1,193	1,097	30
1994	25	5,753	1993-94	118	95	71	4,894	4,113	58
1995	42	7,538	1994-95	167	71	57	5,918	4,059	71
1996	9	1,778	1995-96	84	44	35	2,936	1,679	48
1997	2	83	1996-97	38	22	13	1,617	745	57
1998	5	984	1997-98	94	73	64	20,327	8,622	135
1999	5	2,714	1998-99	95	80	71	10,651	7,533	106
2000	10	3,045	1999-2000	98	64	52	9,816	5,723	107
2001	3	1,098	2000-01	50	27	12	366	256	21
2002	11	2,591	2001-02	114	101	67	8,805	3,669	55
Avg 1978-2002	10	2,351	Avg 1977-2002	118	90	70	8,624	5,402	67

[a] Prior to 1985 the winter commercial fishery occured from January 1 - April 30, as of March 1985, fishing may occur from November 15 - May 15.

[b] The winter subsistence fishery occurs during months of two calendar years (as early as December, through May).

[c] The number of crab actually caught, some may have been returned.

[d] The number of crab harvested is the number of crab caught and kept.

Appendix Table E5. The results of the population assessment surveys conducted for red king crab in Norton Sound since 1976.

Year	Date	Research Agency	Gear	Population Abundance Estimatees Number of crab [c]			Legal Male Biomass (millions of pounds)
				Pre-2 males [b]	Pre-1 Males [b]	Legal Males [a]	
1976	9/2-9/5, 9/16-10/7	NMFS	Trawl	331,555	808,091	1,742,755	5,228,265
1979 [e]	7/26-8/5	NMFS	Trawl			809,799	2,429,397
1980 [d]	7/4-7/14	ADF&G	Pots			1,900,000	5,700,000
1981	6/28 - 7/14	ADF&G	Pots			1,285,195	3,855,585
1982	7/6 - 7/20	ADF&G	Pots			353,273	1,059,819
1982	9/5 - 9/11	NMFS	Trawl	356,724	832,581	877,722	2,633,166
1985	7/1 - 7/14	ADF&G	Pots			907,579	2,722,737
1985	9/16 - 10/1	NMFS	Trawl	466,858	707,140	1,051,857	3,155,571
1988	8/16 - 8/30	NMFS	Trawl	565,255	493,030	978,748	2,936,244
1991	8/22 - 8/30	NMFS	Trawl	294,801	303,682	1,287,486	3,862,458
1996	9/7 - 9/18	ADF&G	Trawl	452,580	325,699	536,235	1,608,705
1999	7/28 - 8/7	ADF&G	Trawl	103,832	940,198	1,594,341	4,783,023
2002	7/27-8/6	ADF&G	Trawl	427,703	518,638	771,569	2,314,707

[a] Legal male red king crab were defined as at least 105 mm in carapace length for the 1996 ADF&G trawl survey and all NMFS trawl surveys except the 1979 survey which defined legal males as at least 100 mm in carapace length. ADF&G pot surveys defined legal males as at least 121 mm in carapace width.

[b] Pre-2 males were defined as 76-89 mm in carapace length and pre-1 males were defined as 90-104 mm in carapace length.

[c] Population estimates are valid for the date of the survey (i.e., either before or after the summer commercial fishery).

[d] The 1980 pot survey estimate has been revised from the original estimate of 13.4 million pounds which was thought inaccurate due to an under-reporting of recovered tagged crab.

[e] Pre-2 male and pre-1 male data is unavailable for the 1979 NMFS trawl survey.

Appendix Table E6. Size composition by percent of red king crab from winter research pots near Nome, Norton Sound Section Eastern Bering Sea, 1983-2002.

	SUBLEGAL [a]			LEGAL [a]		
Year	Prerecruit Twos	Prerecruit Ones	Totals	Recruits	Post-Recruits	Totals
1983	26	38	64	26	10	36
1984	35	31	66	19	16	35
1985	25	45	70	20	10	30
1986	26	35	61	22	17	39
1987	13	31	44	11	45	56
1988 [b]	-	-	-	-	-	-
1989	27	15	42	27	31	58
1990	16	33	49	25	26	51
1991	5	30	35	34	31	65
1992 [c]	-	-	-	-	-	-
1993	3	9	12	17	71	88
1994 [c]	-	-	-	-	-	-
1995	10	11	23 [d]	32	45	77
1996	22	33	64 [d]	10	26	36
1997	32	21	64 [d]	14	22	36
1998	36	44	82 [d]	9	9	18
1999	7	42	49 [d]	39	11	50
2000	16	20	36 [d]	39	25	64
2001	23	16	39 [d]	14	48	61
2002	43	26	79 [d]	9	12	21

[a] Sublegals = male crab less than 4 3/4" carapace width.
Prerecruit age one = Sublegals greater than 89mm in carapace length.
Prerecruit age two = Sublegals smaller than 90mm in carapace length.
Legals = male king crab greater than 4 3/4" carapace width.
Recruits = Legal new shell crab smaller than 116mm in carapace length.
Postrecruits = all non-recruit legal males.

[b] No data collected in 1988 due to poor ice conditions.

[c] No winter crab research study in 1992 or 1994.

[d] Includes prerecruit age three.

Appendix Table E7. Length frequencies by shell age of all legal male red king crab sampled during the 2002 Norton Sound summer open access and CDQ commercial fishery, 2002.

	Legal New Shell Males		Legal Old Shell Males		Total Legal Males	
Carapace Length (mm)	Number	Percent	Number	Percent	Number	Percent
95	0	0.0%	0	0.0%	0	0.0%
96	3	0.1%	0	0.0%	3	0.1%
97	1	0.0%	0	0.0%	1	0.0%
98	4	0.1%	0	0.0%	4	0.1%
99	13	0.2%	1	0.0%	14	0.3%
100	35	0.7%	4	0.1%	39	0.7%
101	41	0.8%	4	0.1%	45	0.9%
102	57	1.1%	7	0.1%	64	1.2%
103	77	1.5%	8	0.2%	85	1.6%
104	96	1.8%	12	0.2%	108	2.1%
105	120	2.3%	7	0.1%	127	2.4%
106	107	2.0%	12	0.2%	119	2.3%
107	106	2.0%	11	0.2%	117	2.2%
108	117	2.2%	9	0.2%	126	2.4%
109	120	2.3%	17	0.3%	137	2.6%
110	145	2.8%	21	0.4%	166	3.2%
111	135	2.6%	19	0.4%	154	3.0%
112	134	2.6%	17	0.3%	151	2.9%
113	142	2.7%	22	0.4%	164	3.1%
114	123	2.4%	26	0.5%	149	2.9%
115	144	2.8%	34	0.7%	178	3.4%
116	129	2.5%	16	0.3%	145	2.8%
117	148	2.8%	17	0.3%	165	3.2%
118	142	2.7%	15	0.3%	157	3.0%
119	146	2.8%	13	0.2%	159	3.0%
120	173	3.3%	25	0.5%	198	3.8%
121	144	2.8%	31	0.6%	175	3.4%
122	162	3.1%	20	0.4%	182	3.5%
123	158	3.0%	22	0.4%	180	3.4%
124	171	3.3%	18	0.3%	189	3.6%
125	171	3.3%	25	0.5%	196	3.8%
126	148	2.8%	27	0.5%	175	3.4%
127	152	2.9%	21	0.4%	173	3.3%
128	127	2.4%	14	0.3%	141	2.7%
129	134	2.6%	15	0.3%	149	2.9%
130	143	2.7%	18	0.3%	161	3.1%

(continued)

Appendix Table E7. Continued.

Carapace Length (mm)	Legal New Shell Males		Legal Old Shell Males		Total Legal Males	
	Number	Percent	Number	Percent	Number	Percent
131	106	2.0%	10	0.2%	116	2.2%
132	85	1.6%	6	0.1%	91	1.7%
133	79	1.5%	11	0.2%	90	1.7%
134	68	1.3%	7	0.1%	75	1.4%
135	69	1.3%	9	0.2%	78	1.5%
136	50	1.0%	4	0.1%	54	1.0%
137	35	0.7%	6	0.1%	41	0.8%
138	21	0.4%	2	0.0%	23	0.4%
139	23	0.4%	3	0.1%	26	0.5%
140	25	0.5%	1	0.0%	26	0.5%
141	16	0.3%	0	0.0%	16	0.3%
142	18	0.3%	2	0.0%	20	0.4%
143	18	0.3%	1	0.0%	19	0.4%
144	9	0.2%	2	0.0%	11	0.2%
145	4	0.1%	1	0.0%	5	0.1%
146	7	0.1%	2	0.0%	9	0.2%
147	9	0.2%	0	0.0%	9	0.2%
148	0	0.0%	0	0.0%	0	0.0%
149	2	0.0%	1	0.0%	3	0.1%
150	1	0.0%	1	0.0%	2	0.0%
151	1	0.0%	0	0.0%	1	0.0%
152	2	0.0%	0	0.0%	2	0.0%
153	0	0.0%	1	0.0%	1	0.0%
154	1	0.0%	0	0.0%	1	0.0%
155	1	0.0%	1	0.0%	2	0.0%
156	0	0.0%	0	0.0%	0	0.0%
157	1	0.0%	0	0.0%	1	0.0%
158	0	0.0%	1	0.0%	1	0.0%
159	0	0.0%	0	0.0%	0	0.0%
160	1	0.0%	0	0.0%	1	0.0%
161	0	0.0%	0	0.0%	0	0.0%
162	0	0.0%	0	0.0%	0	0.0%
Totals	4,620	88.5%	600	11.5%	5,220	100.0%
Average Lengths	119.4		119.6		119.5	

Total Recruits=	1,720	33.0%
Total Postrecruits=	3,500	67.0%

Appendix Table F1. Kotzebue District winter commercial sheefish harvest statistics, 1967- 2002

Year [b]	No. of Fishers	No. of Fish	Pounds[a] Total	Average	Price/ Pound	Estimated Value
1967 [f]		4,000	26,000	6.5	$0.20	$5,200
1968	10	792	4,752	6.0	$0.22	$1,045
1969	17	2,340	15,209	6.5	$0.25	$3,802
1970 [c]		2,206			$0.14	
1971	4	73	720	9.9	$0.13	$95
1972	5	456	4,071	8.9	$0.16	$651
1973	11	2,322	15,604	6.7	$0.20	$3,121
1974	6	1,080 [d]	6,265	5.8	$0.30	$1,880
1975	[e]	2,543 [d]	24,161	9.5	$0.30	$7,248
1976	14	2,633	19,484	7.4	$0.30	$5,845
1977	2	566	5,004	8.8	$0.30	$1,501
1978	11	2,879	26,200	9.1	$0.40	$10,480
1979 [c]						
1980	4	1,175	8,225	7.0	$0.50	$4,113
1981	1	278	1,836	6.6	$0.75	$1,377
1982	11	2,629 [f]	17,376	6.6	$0.75	$13,032
1983	8	1,424	13,395	9.4	$0.50	$6,698
1984	5	927 [d]	10,403	11.2	$0.55	$5,722
1985	4	342 [d]	3,902	11.4	$0.51	$1,990
1986	2	26	312	12.0	$0.75	$234
1987	3	670	5,414	8.1	$0.49	$2,653
1988	3	943	7,373	7.8	$0.45	$3,318
1989	8	2,335	16,749	7.2	$0.51	$8,542
1990 [c]	6	687	5,617	8.2		
1991	5	852	8,224	9.7	$0.50	$4,112
1992	3	289	2,850	9.9	$0.65	$1,853
1993	1	210 [d]	1,700	8.1	$0.50	$850
1994 [c]						
1995	1	226	2,240	9.9	$0.50	$1,120
1996	2	308	3,002	9.7	$0.44	$1,321
1997 [c]						
1998	1	254	2,400	9.4	$0.43	$1,032
1999 [c]						
2000 [c]						
2001	1	19	200	10.5	$1.00	$200
2002	4	30	300	10.0	$1.00	$300

[a] Data is not exact, in some instances total catch poundage was determined from average weight and catch data. Similarly, various price/pound figures were determined from price/ fish and average weight data.

[b] Season was from October 1 to September 30. Year indicated would be the year the commercial season ended. For example, the year 1980 would represent October 1, 1979 to September 30, 1980.

[c] Data unavailable or incomplete.

[d] Number of fish not always reported. Estimates were based on average weight from reported sales which documented the number of fish.

[e] No reported commercial catches.

[f] Estimate based on historical average weight.

Appendix Table F2. Kotzebue District reported subsistence harvests of sheefish, 1966-2002.

Year[a]	Number of Fishers Interviewed	Reported Harvest	Average Catch per Fisher
1966-1967	135	22,400	166
1967-1968	146	31,293	214
1968-1969	144	11,872	82
1970	168	13,928	83
1971	155	13,583	88
1972	79	3,832	49
1973	65	4,883	75
1974	58	1,062	18
1975	69	1,637	24
1976	57	966	17
1977	95	1,810	19
1978	95	1,810	19
1979	75	3,985	53
1980	74	3,117	42
1981	62	6,651	107
5/82-4/83 [b,c]	130	4,704	36
5/83-4/84 [b,c]	27	764	28
5/84-9/84 [b]	30	2,803	93
1985 [d]	2	60	30
1986 [b,d]	72	721	10
1987 [d]	46	276	6
1988 [d]			
1989 [d]			
1990 [d]			
1991	40	2,180	55
1992	43	2,821	66
1993	46	2,441	53
1994	171	3,181	19
1995 [e]	314	9,465	30
1996 [e]	389	6,953	18
1997 [e]	338	9,805	24.6
1998 [e]	435	5,350	13.6
1999 [e]	191	8,256	18.6
2000 [e]	237	7,446	16.6
2001 [e]	363	3,838	8.9
2002 [f]	101	4,310	37.5

[a] To obtain individual village catches during years previous to 1982, refer to the 1982 Annual Management Report. Due to limited effort during many years, total catch and effort should be regarded as minimum numbers only and are not comparable year to year.

[b] Catch by village for these years are presented in separate tables in respective year annual management reports.

[c] Summer catches only: winter catches were not documented.

[d] Villages were not surveyed for subsistence sheefish harvests from 1985 to 1990; numbers shown are catches reported during the fall chum salmon subsistence surveys and may include summer as well as winter harvests.

[e] Subsistence sheefish harvests are from villages on Kobuk River.

[f] Noorvik only.

Appendix Table F3. Peak annual aerial survey counts of sheefish in the Kobuk and Selawik Rivers, 1966-2002.

Year[a]	Kobuk River	Abundance Estimate for Kobuk River spawning area[e]	Selawik River	Total
1966	1,200		[c]	1,200
1967	1,025		[c]	1,025
1968	4,973		1,234	6,207
1969	3,654		[c]	3,654
1970	3,220		[c]	3,220
1971	8,166		1,196	9,362
1972	[b]		[c]	
1973	[c]		[c]	
1974	[b]		[c]	
1975	[b]		[c]	
1976	73		[c]	73
1977	[c]		[c]	
1978	2,824		[c]	2,824
1979	1,772		[c]	1,772
1980	250 [d]		[c]	250
1981	[b]		[c]	[b]
1982	1,009 [d]		[c]	1,009
1983	2,604		[c]	2,604
1984	[c]		[c]	
1985	[c]		[c]	
1986	[c]		[c]	
1987	[c]		[c]	
1988	[c]		[c]	
1989	[c]		[c]	
1990	[c]		[c]	
1991	17,335		[c]	17,335
1992	3,310		[c]	3,310
1993	[c]		[c]	
1994	[c]		[c]	
1995	1,840	32,273	[c]	1,840
1996	[c]	43,036	[c]	
1997	[c]	26,782	[c]	
1998	[c]		[c]	
1999	[c]		[c]	
2000	[c]	[c]	[c]	
2001	[c]	[c]	[c]	
2002	[c]	[c]	[c]	

[a] Counts are considered minimal as conditions ranged from poor to good.

[b] No fish reported.

[c] Not surveyed.

[d] Probably more sheefish than listed; species identification problems.

[e] Mark recapture abundance estimates for Kobuk River spawning area conducted by Div. of Sport Fish 1995-1997.

Appendix Table P4. Kotzebue District incidentally caught and sold Dolly Varden during the commercial salmon fishery, 1966-2002.

Year	Number of Fish Sold	Estimated Total Catch [a]	Pounds Sold	Average Weight [b]	Average Price
1966	3,325				0.55 [c]
1967	367		2,606	7.1	0.11
1968	3,181		21,949	6.9	0.14
1969	1,089 [d]				2.84 [c]
1970	2,095				
1971	3,828 [e]		23,353	6.1	0.16
1972	7,746		56,545	7.3	0.17
1973	640		4,608	7.2	0.16
1974	2,605 [f]		20,580	7.9	0.16
1975					
1976					
1977					
1978	1,229		9,094	7.4	0.15
1979	2,523		12,523	5.0	0.25
1980	3,049		17,015	5.6	0.20
1981	3 [g]		16	5.3	0.17
1982	3,447		23,648	6.9	0.20
1983	190 [g]	845	1,108	5.8	0.20
1984	347 [g]	1,090	2,104	6.1	0.25
1985	454	3,600	3,177	7.0	0.25
1986	5 [g]	2,373	34	6.8	0.20
1987	1,261	[h]	8,704	6.9	0.30
1988	752	[h]	4,967	6.6	0.35
1989	3,093	[h]	20,293	6.6	
1990	604	[h]	4,219	7.0	0.25
1991	6,136	[h]	40,747	6.6	0.18
1992	1,977	[h]	11,951	6.0	0.10
1993	76	[h]	540	7.1	0.10
1994	149	[h]	767	5.1	0.17
1995	2,090	[h]	13,195	6.3	0.20
1996	188	[h]	1,153	6.1	0.25
1997	3,120	[h]	23,203	7.0	0.20
1998	349	[h]	2,640	7.6	0.20
1999	1,502	[h]	11,352	7.6	0.20
2000	7	[h]	44	6.3	0.20
2001	0	[h]	0		
2002	0	30	0		

[a] Estimate includes fish caught but not sold based on interviews of fishers.

[b] Some data extrapolated from average reported weight.

[c] Price per fish.

[d] Includes 269 taken by permit.

[e] Includes 179 taken by permit.

[f] Includes 234 taken during commercial sheefish fishery.

[g] Limited Dolly Varden market; many fish were taken home or dumped.

[h] Estimate of Dolly Varden caught, but not sold, not made.

Appendix Table F5. Subsistence harvests of Dolly Varden from the villages of Kivalina and Noatak, 1959-2002.

	Kivalina		Noatak
Year	Number	Pounds	Number [a]
1959 [b]	34,240	85,600	
1960 [b]	49,720	124,300	
1962			27,623
1963			4,150
1968 [c]	49,512	120,214	
1969	64,970	152,750	32,350
1970	33,820	79,420	3,700
1971	29,281	68,518	5,320
1972	48,807	114,637	1,492
1973 [d]			
1979 [e]	14,600		9,060
1980			7,220
1981	15,000-18,000		3,056
1982	18,438 [f]		2,676 [d]
1983	16,270 [g]		4,545
1984	12,000 [e]		2,542
1985	10,500 [e]		
1986	7,436 [e]		46 [h]
1987 [b]			1,376 [d]
1988			
1989			
1990			
1991 [b]			4,814
1992 [b]			4,395
1993 [b]			4,275
1994			
1995 [b]			5,762
1996 [b]			5,031
1997 [b]			4,763
1998 [b]			3,872
1999 [i]			
2000 [b]			3,315
2001 [b]			2,702
2002 [b]			3,242

[a] No data available on poundage.

[b] From Scarlo, Doris J. and Brian Kessel. 1966. Environment of Cape Thompson Region, Alaska. U.S. Atomic Commission.

[c] Harvest data from Stephen Braund and Associates.

[d] Storm and ice conditions prevented fall harvest.

[e] Harvest data from Division of Sport Fish surveys.

[f] Expanded estimates (see text on subsistence fishery in the 1982 Annual Management Report).

[g] Subsistence fishers just beginning to beach seine at the time of this survey.

[h] ADF&G, Div. of Subsistence, household surveys in Noatak.

[i] Data not collected

Appendix Table F6. Aerial survey counts of overwintering and spawning Dolly Varden in the Kotzebue District 1968-2002.

Year [a]	Noatak River Spawner Survey [b]	Overwintering	
		Wulik River [c]	Kivalina River [c]
1968		90,236	27,640
1969		297,257	
1976		68,300	12,600
1977 [d]			
1978 [d]			
1979		55,030	15,744
1980		113,553	39,692
1981	7,922	101,826	45,355
1982	8,275	65,581	10,932
1983	2,924 [e]	[g]	[g]
1984	9,130	30,923	5,474
1985	10,979		
1986	[f]	5,590	5,030
1987	[f]	[f]	[f]
1988	[f]	80,000 [e]	[f]
1989	[f]	56,384	[f]
1990	7,261	[f]	[f]
1991	9,605	126,985	35,275
1992	[f]	135,135	[g]
1993	9,560	144,138	16,534
1994	[f]	66,752	[f]
1995	6,500	128,705	28,870
1996	12,184	61,005	[f]
1997	[f]	95,412	[f]
1998	[f]	104,043	[f]
1999	9,059 [h]	70,704	[f]
2000	[f]	[f]	[f]
2001	[f]	92,614	[f]
2002	[f]	44,257	[f]

[a] Counts are considered minimal as data listed includes both poor and good surveys.

[b] Includes spawner counts on the Kelly, Kugururok and Nimiuktuk Rivers, and tributaries of the Noatak River.

[c] Surveys conducted by Division of Sport Fish since 1979.

[d] Poor weather hampered or prevented survey.

[e] Incomplete survey.

[f] Not surveyed.

[g] Poor conditions on the Nimiuktuk did not allow a count.

Appendix Table F7. Subsistence whitefish catch and effort in the Kotzebue District, 1970-2002.

Year[a]	Number of Fishers Interviewed	Number of Whitefish Harvested
1970		58,165
1971		36,012
1977		30,810
1978		77,474
1979	123	43,653
1980	67	49,106
1981	71	37,746
1982 [b]		
1983	47	16,389
1984	79	28,614
1985 [c]	46	5,229
1986 [d]	72	11,854
1987 [d]	46	20,020
1988 [e]	38	14,000
1989 [b]		
1990 [b]		
1991 [d]	63	16,015
1992 [d]	66	17,485
1993 [d]	70	19,060
1997	413 [f]	84,851
1998	435 [f]	39,754
1999	191 [f]	56,326
2000	237 [f]	70,097
2001	363 [f]	30,976
2002	101 [g]	25,607

[a] Whitefish harvest information was collected during chum salmon subsistence surveys and is to be considered a small fraction of the annual catch.

[b] Data unavailable.

[c] Subsistence harvest information from Kiana and Shungnak villages only.

[d] Subsistence interviews from Noatak, Noorvik and Shungnak villages only.

[e] Subsistence harvest information from Noorvik and Shungnak villages only.

[f] Number of households contacted. Subsistence harvest information from Ambler, Kiana, Kobuk, Noatak, Noorvik, and Shungnak.

[g] Number of households contacted. Subsistence harvest information from Noatak and Noorvik.

Appendix G1. List of common and scientific names of finfish species of the Norton Sound, Port Clarence, and Kotzebue Districts.

Common Name	Scientific Name
Arctic lamprey	*Lampetra japonica*
Arctic char	*Salvelinus alpinus*
Arctic cod	*Boreogadus saida*
Arctic flounder	*Liopsetta glacialis*
Arctic grayling	*Thymallus arcticus*
Alaska plaice	*Pleuronectes quadrituberculatus*
Burbot	*Lota lota*
Bering cisco	*Coregonus laurettae*
Bering poacher	*Ocella dodecaedria*
Bering wolfish	*Anarjicas orientalis*
Blackfish	*Dallia pectoralis*
Boreal smelt (rainbow-toothed)	*Osmerus mordax*
Broad whitefish	*Coregonus nasus*
Capelin	*Mallotus villosus*
Dolly Varden	*Salvinus malma*
Pond smelt	*Hypomesus olidus*
Humpback whitefish	*Coregonus pidschian*
Inconnu (sheefish)	*Stenodus leucichthys*
Lake trout	*Salvelinus namaycush*
Least cisco	*Coregonus sardinella*
Longhead dab	*Liranda probiscidea*
Ringtail snailfish	*Liparis rutteri*
Northern Pike	*Esox lucius*
Longnose sucker	*Casostomus catostomus*
Pricklebacks	*Stichaeidae*
Pacific herring	*Clupea harengus pallasi*
Rock flounder	*Lepidosetta bilineata*
Rock greenling (terpug)	*Hexagrammus lagocephalus*
Round whitefish	*Prosopium cylindraceum*
Sculpins	*Cottodae*
Pink salmon	*Oncorhynchus gorbuscha*
Chum salmon	*Oncorhynchus keta*
Coho salmon	*Oncorhynchus kisutch*
Sockeye salmon	*Oncorhynchus nerka*
Chinook salmon	*Oncorhynchus tshawytscha*
Saffron cod	*Eleginus gracilis*
Starry flounder	*Platichthys stellatus*
Sandlance	*Amrodytes hexapterus*
Sturgeon poacher	*Angonus acipenserinus*
Threespine stickleback	*Gasterocteus aculeatus*
Ninespine stickleback	*Pungitius pungitius*
Tubenose poacher	*Pallasina barbata aix*
Whitespotted greenling	*Hexagrammus stelleri*
Yellowfin sole	*Limanda aspera*

Appendix G2. Alaska Department of Fish and Game and associated cooperative studies conducted within the Norton Sound, Port Clarence, and Kotzebue Districts, 2002.

HERRING

Herring Test Fishing

a)Location: Norton Sound ocean waters; camps at Cape Denbigh and Klikitarik; and, a third test fish crew operated out of Unalakleet.

b)Description: To determine age class composition through test fishing with variable mesh gillnets and collection of commercial catch samples. Alaska Department of Fish and Game (ADF&G) project with additional funding from Norton Sound Economic Development Corporation (NSEDC) for Unalakleet crew.

SALMON

Unalakleet Escapement Studies

a)Location: Unalakleet River, approximately three miles upstream from village of Unalakleet at first bluff, and, at village of Unalakleet.

b)Description: To maintain an index of migration up Unalakleet River using test gillnets at bluff. Sample commercial catch for age and size at Unalakleet. Egg collection for fecundity project conducted by NSEDC and LGL. ADF&G project.

North River Tower

a)Location: North River, approximately two miles below bridge.

b)Description: Determine daily and seasonal timing and magnitude of escapements. Cooperative project operated by Unalakleet IRA, Bering Sea Fishermen's Association (BSFA), NSEDC, and ADF&G.

Kwiniuk River Tower

a)Location: Kwiniuk River, approximately five miles upstream from mouth.

b)Description: Determine daily and seasonal timing and magnitude of chum and pink salmon escapements. Determine age, sex and length of chinook and chum salmon in the Kwiniuk River escapement. ADF&G project with additional funding from Norton Sound Initiative (NSI) and NSEDC.

Niukluk River Tower

a)Location: Niukluk River, approximately five miles upstream from mouth.

b)Description: Determine daily and seasonal timing, magnitude, age, sex and length of escapements. Collect age and sex data through escapement sampling of subsistence catches, beach seining or carcass sampling. ADF&G project with additional funding from NSI and NSEDC.

Eldorado River Tower / Fixed Weir

a)Location: Eldorado River, approximately 18 miles upstream from the Safety Sound highway bridge, above the furthest upstream connecting channel to the Flambeau River.

b)Description: Determine daily and seasonal timing and magnitude of escapements. Midseason, counting tower converted to a fixed weir. Cooperative project operated by Kawerak Inc. with assistance from ADF&G, and funded by Kawerak Inc., BSFA, NSI, and NSEDC.

Nome River Fixed Weir

a)Location: Nome River, approximately 1 mile upstream of the VOR site.

b)Description: To determine daily and seasonal timing and magnitude of the spawning runs. Compare aerial survey totals with weir counts in order to improve survey accuracy. As time and personnel allow, collect age and sex data through escapement sampling of subsistence catches, weir trap, beach seining or carcass sampling. ADF&G project with additional funding from NSI and NSEDC.

Snake River Tower / Fixed Weir

a)Location: Snake River, approximately five miles upstream of boat harbor, where river turns north.

b)Description: Determine daily and seasonal timing and magnitude of escapements. Cooperative project operated by Kawerak Inc. with assistance from ADF&G, and funded by Kawerak Inc., BSFA, NSI, and NSEDC.

Fish River Chum Salmon Radiotelemetry

a)Location: Fish River, approximately 3 miles upstream from the village of White Mountain, on White Mountain IRA land. Ground-based radio telemetry receiving and recording stations in three locations: just below White Mountain; main confluence of Niukluk and Fish Rivers; and, side channel of the Niukluk River with Fish River.

b)Description: Seine chum salmon for monitoring upriver migrations to determine drainage wide distribution, peak spawning areas, and timing. Estimate drainage population using ratio of tagged to untagged chum salmon that pass the Niukluk tower. Estimate stock origin of Niukluk and Fish River chum salmon through collection of age, length, and sex data. Additional escapement estimates done with aerial surveys on tributary rivers and creeks. ADF&G project with funding from NSI with a 25% state of Alaska match.

Glacial Lake Salmon Counting Weir

a)Location: At outlet of Glacial Lake.

b)Description: Determine daily and seasonal timing and magnitude of the spawning runs. Compare aerial survey totals with weir counts in order to improve survey accuracy. As time and personnel allow, collect age and sex data through escapement sampling of weir trap, beach seining or carcass sampling. U.S. Bureau of Land management (BLM) project.

Pilgrim River Counting Tower

a)Location: Pilgrim River, approximately 6 miles downstream of Pilgrim River bridge at mile 65 of the Kougarok Road / Nome-Taylor Highway.

b)Description: Determine daily and seasonal timing and magnitude of the salmon escapements. Cooperative project operated by Kawerak Inc. with assistance from ADF&G, Bering Sea Fishermen's Association (BSFA), Norton Sound Initiative (NSI), NSEDC.

Appendix G2. (continued)

Northwest Salmon Biological / Rehabilitation Projects

1). Salmon Lake Limnology Project / Sockeye Salmon Restoration

a)Location: Salmon Lake, throughout; and smolt trap 2 miles downstream from lake, on Pilgrim River.

b)Description: To restore sockeye salmon population to higher historical levels, biological (age, weight, and length) samples taken from emigrating smolt and enumerated by mark recapture. Hydrocaustic-tow net studies conducted to estimate rearing fry population and gather growth data. ADF&G project with additional funding from NSEDC and BLM.

2). Hobson Creek Instream Incubation Project.

a)Location: Spring fed tributary to the Nome River, approximately mile-19 Kougarok Road / Nome-Taylor Highway.

b)Description: Instream incubator boxes and incubation facility for supplemental salmon production. ADF&G project in cooperation with a NSEDC and LGL study of chum salmon egg development. Land leased from Sitnasuak Native Corporation.

3). Boulder Creek Instream Chum Salmon Incubation Boxes

a)Location: A tributary spring creek on the Snake River, approximately 19 miles from Nome.

b)Description: Instream incubator boxes to increase survival of eggs and production of chum salmon in Snake River. Units not in operation since 1999, all equipment removed from the site in 2002.

4). Safety Sound Chum Salmon Juvenile Ecology Project

a)Location: Safety Sound, throughout.

b)Description: To determine juvenile chum salmon seasonal migration patterns from fresh to marine waters, and changes in seasonal juvenile body length, weight, and condition. NSEDC, LGL project with funding from NSI.

Kobuk River Test Fish Project

a)Location: Lower Kobuk River, approximately 2 miles downriver of Kiana.

b)Description: To evaluate chum salmon abundance migrating into the Kobuk River drainage using systematic drift gillnet catches. To qualitatively assess the impact of the Kotzebue District commercial salmon fishery on chum abundance into the Kobuk River drainage for fisheries management purposes. Describe migratory timing in the lower Kobuk River. Sample for age, sex and length. ADF&G project.

Subsistence Salmon Fishing Surveys

a)Location: Norton Sound, Port Clarence, and Kotzebue Districts.

b)Description: Determine subsistence utilization of salmon for formulating management procedures and goals. House-to-house surveys were conducted in the Norton Sound, Port Clarence, and Kotzebue District surrounding villages by the Division of Subsistence. Subsistence salmon permits were issued in the Nome Subdistrict. ADF&G project with assistence from Kawerak Inc.

CRAB

Nearshore Winter King Crab Study

a)Location: Ocean waters of Norton Sound, 1 to 1.5 miles south of Nome.

b)Description: Document the abundance and distribution of red king crab in nearshore Nome waters. Tag all male new shell red king crab with carapace length $\leq$ 160 mm. ADF&G project.

Norton Sound King Crab Trawl Survey

a)Location: Ocean waters of Norton Sound, 10 mile grid.

b)Description: Triannual trawl survey to establish abundance of red king crab. Biological (sex and size) samples, and species present-absence data taken. ADF&G project with finacial assistance from National Oceanic and Atmospheric Administration (NOAA).

Appendix G3. Norton Sound, Port Clarence, Kotzebue Sound processors, 2002.

Company	Address	Type of Processing	District
Aqua Tech Anchorage, AK 99510	P.O. Box 10119	Fresh Crab	Norton Sound
Norton Sound Seafood Products King Crab	Box 323 Unalakleet, AK	Frozen/Fresh Salmon Herring Roe on Kelp	Norton Sound
Great Pacific Fisheries	Anchorage, AK	Fresh Salmon	Kotzebue
Norquest Seafoods Seattle, WA 98107	5245 Shilshole Ave NW	Frozen Herring	Norton Sound

COMMUNITY ID# _____
HHID#_____

NORTON SOUND AND SEWARD PENINSULA AREA

2002 SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY

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

Community: _____
Survey Date: _____
Interviewer: _____

Household Head Name: _____
***Household Size** _____
If new household, where were you living last year? _____
_____
P.O. Box (if new) _____

***1. Did your household catch salmon for subsistence use this year (including with a rod-and-reel)?** No____ Yes____

***2. Does your household usually subsistence fish for salmon?** No____ Yes____

FISHING HOUSEHOLDS ("Yes" to #1)

3. Please estimate how many salmon your household caught for subsistence use this year , including with a rod-and-reel (your share of the catch if fishing with others). Include salmon you gave away, ate fresh, lost to spoilage, or obtained from helping others process fish.

CHUM_____ ("DOGS") CHINOOK_____ ("KINGS") PINK_____ ("HUMPIES") SOCKEYE_____ ("REDS") COHO_____ ("SILVERS") UNKNOWN SALMON_____

4. What type(s) of fishing gear did your household use for catching subsistence salmon this year?

SET GILL NET_____ SEINE_____
ROD-AND-REEL_____ DRIFT GILL NET_____

4a. (If rod-and- reel was used) How many salmon did your household catch and keep with rod-and-reel this year?

CHUM_____ ("DOGS") CHINOOK_____ ("KINGS") PINK_____ ("HUMPIES") SOCKEYE_____ ("REDS") COHO_____ ("SILVERS")

5. Did your household give salmon to other households this year? No _____ Yes _____

6. How was subsistence chum salmon fishing for your household this year?
_____VERY GOOD _____AVERAGE _____POOR IF POOR, WHY?_____

7. Did your household catch salmon specifically for dog food? (Using salmon for dog food is allowed by regulations.)
No _____ (Go to #13) Only backbones/heads/guts/scraps/spoiled fish _____ (Go to #13) Yes _____(Go to #8)

If Household Fished for Dog Food:

8. How many salmon did your household catch for dog food? (Do not include fish lost to spoilage and fed to dogs.)

CHUM_____ ("DOGS") CHINOOK_____ ("KINGS") PINK_____ ("HUMPIES") SOCKEYE_____ ("REDS") COHO_____ ("SILVERS") UNKNOWN SALMON_____

9. Were these salmon included in the estimates you already gave me? No_____ Yes _____

10. How many dogs does your household have? _____ (Go to #13)

HH ID#_____

NORTON SOUND AND SEWARD PENINSULA AREA

2002 SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY (CON'T)

NON-FISHING HOUSEHOLDS ("No" to #1)

11. Did your household help another household fish, cut or hang salmon, or process it some other way? No_____(Go to #13)
Yes _____

12. Did you receive salmon in exchange for your help? No ____ Yes ____

If yes, please estimate how many salmon you received for your household. (Do not include fish from a F&G test net.)

CHUM_____ ("DOGS") CHINOOK_____ ("KINGS") PINK_____ ("HUMPIES") SOCKEYE_____ ("REDS") COHO_____ ("SILVERS") UNKNOWN SALMON_____

(Go to #13)

COMMERCIAL FISHING

***13. Did your household commercially fish for salmon this year?** No _____ (Go to #17) Yes _____

If yes, where?_____

14. Were all of the salmon you caught when commercial fishing sold or were some brought home to eat or processed for subsistence? All sold _____ (Go to #17) Some used for subsistence _____

15. How many commercially caught salmon did your household use for subsistence?

CHUM_____ ("DOGS") CHINOOK_____ ("KINGS") PINK_____ ("HUMPIES") SOCKEYE_____ ("REDS") COHO_____ ("SILVERS") UNKNOWN SALMON_____

16. Were these salmon included in the estimates you already gave me? No _____ Yes _____

***17. Do you have any suggestions or concerns about subsistence fishing?**

THANK YOU FOR YOUR TIME AND FOR HELPING WITH THIS PROJECT.

A summary of this subsistence fishing survey will be sent to you next spring (April).

COMMUNITY ID# _____
HHID# _____

NOATAK RIVER AREA

2002 SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY

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

Community: _____
Survey Date: _____
Interviewer: _____

Household Head Name: _____
*Household Size _____
If new household, where were you living last year? _____
_____
(If new household) P.O. Box: _____

*1. **Did your household catch salmon for subsistence use or with a rod-and-reel this year?** No____ Yes____

*2. **Does your household usually subsistence fish for salmon?** No____ Yes____

FISHING HOUSEHOLDS ("Yes" to #1)

3. Please estimate how many salmon your household caught for subsistence use or with a rod-and-reel this year (your share of the catch if fishing with others). Include salmon you gave away, ate fresh, lost to spoilage, or obtained from helping others process fish.

CHUM_____ ("DOGS") CHINOOK_____ ("KINGS") PINK_____ ("HUMPIES") SOCKEYE_____ ("REDS") COHO_____ ("SILVERS") UNKNOWN SALMON_____

4. What type(s) of fishing gear did your household use for catching subsistence salmon this year?

SET GILL NET_____ SEINE_____
ROD-AND-REEL_____ DRIFT GILL NET_____

4a. (If rod-and-reel was used) How many salmon did your household catch and keep with rod-and-reel this year?

CHUM_____ ("DOGS") CHINOOK_____ ("KINGS") PINK_____ ("HUMPIES") SOCKEYE_____ ("REDS") COHO_____ ("SILVERS")

5. Did your household give salmon to other households this year? No ____ Yes ____

6. How was subsistence chum salmon fishing for your household this year?
____VERY GOOD ____AVERAGE ____POOR IF POOR, WHY?_____

7. Did your household catch salmon specifically for dog food? (Using salmon for dog food is allowed by regulations.)
No ____ (Go to #13) Only backbones/heads/guts/scraps/spoiled fish ____ (Go to #13) Yes ____(Go to #8)

If Household Fished for Dog Food:

8. How many salmon did your household catch for dog food? (Do not include fish lost to spoilage and fed to dogs.)

CHUM_____ ("DOGS") CHINOOK_____ ("KINGS") PINK_____ ("HUMPIES") SOCKEYE_____ ("REDS") COHO_____ ("SILVERS") UNKNOWN SALMON_____

9. Were these salmon included in the estimates you already gave me? No____ Yes ____

10. How many dogs does your household have? _____ (Go to #13)

HHID#_____

NOATAK RIVER AREA

2002 SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY (CON'T)

NON-FISHING HOUSEHOLDS ("No" to #1)

11. Did your household help another household fish, cut or hang salmon, or process it some other way? No_____(Go to #13)
Yes _____

12. Did you receive salmon in exchange for your help? No ____ Yes ____

If yes, please estimate how many salmon you received for your household. (Do not include fish from a F&G test net.)

CHUM_____ ("DOGS") CHINOOK_____ ("KINGS") PINK_____ ("HUMPIES") SOCKEYE_____ ("REDS") COHO_____ ("SILVERS") UNKNOWN SALMON_____

(Go to #13)

COMMERCIAL FISHING

***13. Did your household commercially fish for salmon this year?** No _____ (Go to #17) Yes _____
If yes, where?_____

14. Were all of the salmon you caught when commercial fishing sold or were some brought home to eat or processed for subsistence? All sold _____ (Go to #17) Some used for subsistence _____

15. How many commercially caught salmon did your household use for subsistence?

CHUM_____ ("DOGS") CHINOOK_____ ("KINGS") PINK_____ ("HUMPIES") SOCKEYE_____ ("REDS") COHO_____ ("SILVERS") UNKNOWN SALMON_____

16. Were these salmon included in the estimates you already gave me? No _____ Yes _____

TROUT (CHAR) AND WHITEFISH FISHING

***17. Did your household catch trout or whitefish for subsistence use this year?** No ____(Go to #19) Yes_____

18. Please estimate how many trout and whitefish your household caught for subsistence use this year (your share of the catch if fishing with others). Include fish you caught and gave away, ate fresh, lost to spoilage, or fed to dogs.

TROUT _____ WHITEFISH _____

***19. Do you have any suggestions or concerns about subsistence fishing?**

THANK YOU FOR YOUR TIME AND FOR HELPING WITH THIS PROJECT.

A summary of this subsistence fishing survey will be sent to you next spring (April).

Appendix G6.

COMMUNITY ID# _____
HHID# _____

KOBUK RIVER AREA

2002 SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY

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

Community: _____
Survey Date: _____
Interviewer: _____

Household Head Name: _____
*Household Size _____
If new household, where were you living last year? _____
_____
(If new household) P.O. Box: _____

*1. Did your household catch salmon for subsistence use or with a rod-and-reel this year?
No____ Yes____

*2. Does your household usually subsistence fish for salmon? No____ Yes____

FISHING HOUSEHOLDS ("Yes" to #1)

3. Please estimate how many salmon your household caught for subsistence use or with a rod-and-reel this year (your share of the catch if fishing with others). Include salmon you gave away, ate fresh, lost to spoilage, or obtained from helping others process fish.

CHUM_____ ("DOGS") CHINOOK_____ ("KINGS") PINK_____ ("HUMPIES") SOCKEYE_____ ("REDS") COHO_____ ("SILVERS") UNKNOWN SALMON_____

4. What type(s) of fishing gear did your household use for catching subsistence salmon this year?

SET GILL NET _____ SEINE _____
ROD-AND-REEL _____ DRIFT GILL NET _____

4a. (If rod-and-reel was used) How many salmon did your household catch and keep with rod-and-reel this year?

CHUM_____ ("DOGS") CHINOOK_____ ("KINGS") PINK_____ ("HUMPIES") SOCKEYE_____ ("REDS") COHO_____ ("SILVERS")

5. Did your household give salmon to other households this year? No _____ Yes _____

6. How was subsistence chum salmon fishing for your household this year?
_____VERY GOOD _____AVERAGE _____POOR IF POOR, WHY?_____

7. Did your household catch salmon specifically for dog food? (Using salmon for dog food is allowed by regulations.)
No ____ (Go to #13) Only backbones/heads/guts/scraps/spoiled fish ____ (Go to #13) Yes _____(Go to #8)

If Household Fished for Dog Food:

8. How many salmon did your household catch for dog food? (Do not include fish lost to spoilage and fed to dogs.)

CHUM_____ ("DOGS") CHINOOK_____ ("KINGS") PINK_____ ("HUMPIES") SOCKEYE_____ ("REDS") COHO_____ ("SILVERS") UNKNOWN SALMON_____

9. Were these salmon included in the estimates you already gave me? No_____ Yes _____

10. How many dogs does your household have? _____ (Go to #13)

HHID#_____

KOBUK RIVER AREA

2002 SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY (CON'T)

NON-FISHING HOUSEHOLDS ("No" to #1)

11. Did your household help another household fish, cut or hang salmon, or process it some other way? No_____(Go to #13)
Yes _____

12. Did you receive salmon in exchange for your help? No ____ Yes ____

If yes, please estimate how many salmon you received for your household. (Do not include fish from a F&G test net.)

CHUM_____ ("DOGS") CHINOOK_____ ("KINGS") PINK_____ ("HUMPIES") SOCKEYE_____ ("REDS") COHO_____ ("SILVERS") UNKNOWN SALMON_____

(Go to #13)

COMMERCIAL FISHING

***13. Did your household commercially fish for salmon this year?** No _____ (Go to #17) Yes _____
If yes, where?_____

14. Were all of the salmon you caught when commercial fishing sold or were some brought home to eat or processed for subsistence? All sold _____ (Go to #17) Some used for subsistence _____

15. How many commercially caught salmon did your household use for subsistence?

CHUM_____ ("DOGS") CHINOOK_____ ("KINGS") PINK_____ ("HUMPIES") SOCKEYE_____ ("REDS") COHO_____ ("SILVERS") UNKNOWN SALMON_____

16. Were these salmon included in the estimates you already gave me? No _____ Yes _____

SHEEFISH AND WHITEFISH FISHING

***17. Did your household catch sheefish or whitefish for subsistence use this year?** No ____(Go to #19) Yes_____

18. Please estimate how many sheefish and whitefish your household caught for subsistence use this year (your share of the catch if fishing with others). Include fish you caught and gave away, ate fresh, lost to spoilage, or fed to dogs.

SHEEFISH _____ WHITEFISH _____

***19. Do you have any suggestions or concerns about subsistence fishing?**

THANK YOU FOR YOUR TIME AND FOR HELPING WITH THIS PROJECT.

A summary of this subsistence fishing survey will be sent to you next spring (April).

Appendix G7. Emergency Orders issued during 2002.

Emergency Order Number	Effective Date	Action Taken	Comments
3-S-Z-01-02	June 15, 2002	This emergency order closes the Nome Subdistrict to all Tier I subsistence salmon fishing effective June 15 until August 1, unless superceded by subsequent emergency order. In addition, this emergency order establishes weekly Tier II marine water fishing periods which begin at 6:00 p.m. Tuesday, June 25 and run until 6:00 p.m. Friday, June 28, and 6:00 p.m. Tuesday until 6:00 p.m. Friday during the month of July. Marine waters from Cape Nome to Topkok Head will open on Tuesday June 25. Department staff anticipates a harvestable surplus of approximately 1,500 chum salmon. The Board of Fisheries has mandated that a harvestable surplus of less than 3,430 be managed as a Tier II fishery. Only Tier II permit holders will be allowed to subsistence fish for salmon in the Nome Subdistrict.	For the past decade the chum salmon fisheries of the Nome Subdistrict have been weak. Although limited rebuilding has occurred the chum salmon returns are far weaker than those prior to 1987. Once again, the waters of the Nome Subdistrict are being closed to provide chum salmon spawning stock. Chum salmon are beginning to arrive in local waters at this time. The chum salmon stock of the Nome Subdistrict is judged insufficient to support the full subsistence need of the residents of the Nome Subdistrict. Tier II fishing rules will allow those residents determined to be the longest users and the most dependent users of the salmon to meet their harvest needs. The other salmon species present in the Nome Subdistrict during July are not present in sufficient numbers to provide for subsistence needs without also harvesting chum salmon. Chinook and sockeye salmon are very limited in number and although desirable as food, have always been caught incidentally to the chum salmon. Even-year pink salmon returns are typically very abundant, but are not expected to build appreciably until July 4. At this time, the Tier I closure of these other salmon species is necessary for both conservation and to allow the orderly management of the Tier II fishery. In early July Tier I subsistence fishing with pink salmon gear may be opened and by late July, Tier I subsistence fishing for other salmon species may also be reopened. Subsistence fishing for Tier II permit holders will begin 6:00 p.m. June 25 and will run until 6:00 p.m. June 28 in the marine waters from Topkok Head to Cape Nome. As the salmon run develops, harvestable surpluses are anticipated in several local streams. Tier II openings will be announced in these streams beginning shortly after the Fourth of July in order to provide for ideal drying conditions. Tier II permit holders will be limited to 100 chum salmon each. The permit holders will find that in no individual location will they be allowed to take all 100 salmon. They will be required to spread their harvest over two or more locations so that fishing impacts will be spread over a broader area. Department staff will begin issuing Tier II permits June 17 at the Nome Fish and Game office. Initially 30 Tier II permits will be issued. Historically, a Tier II permit holder has averaged slightly less than 50 chum salmon a season. A person from each household awarded a permit will be issued a permit form and will be given an explanation of the fishing limits and rules. Later in the season, if the harvestable surplus is estimated to be substantially greater than 1,500 chum salmon, or a number of Tier II permit holders are not fishing, additional Tier II permits may be issued. Should the harvestable surplus exceed 3,430, the management of the fishery would be converted back to Tier I management rules. The staff will be flying frequent aerial surveys and boating some of the rivers to track the salmon migration's strength and progress. The weirs and towers on the Nome, Snake, and Eldorado Rivers will also be used to track the various salmon migrations. If a streams appears to have adequate escapement, restrictions will be lifted in that area; otherwise, the restrictions will remain in place until they no longer benefit chum salmon.
3-S-Z-02-02	July 1, 2002	This emergency order opens the fresh waters west of the Safety Sound bridge and the Eldorado and Flambeau Rivers to Tier II subsistence fishing for 24 hours from 6:00 p.m. Monday, July 1, 2002 until Tuesday, 6:00 p.m. July 2, 2002. Only Tier II permit holders will be allowed to subsistence fish for salmon in the waters west of the Safety Sound bridge and the Eldorado and Flambeau Rivers.	Tier II fishing rules will allow those residents determined to be the longest users and the most dependent users of the salmon to meet their harvest needs. The other salmon species present in the Nome Subdistrict during July are not present in sufficient numbers to provide for subsistence needs without also harvesting chum salmon. Chinook and sockeye salmon are very limited in number and although desirable as food, have always been caught incidentally to the chum salmon. Even-year pink salmon returns are typically very abundant, and are building earlier than expected which may allow for targeted harvests later in the week. However, at this time, the Tier I closure of these other salmon species is necessary for both conservation and to allow the orderly management of the Tier II fishery. In early July, Tier I subsistence fishing with pink salmon gear may be opened and by late July, Tier I subsistence fishing for other salmon species may also be reopened. Subsistence fishing for Tier II permit holders will began on June 25 with a 72-hour period in the marine waters east of Cape Nome. Fishers reported good catches of chum and pink salmon. Although Tier II fishers are able to harvest 100 chum salmon only 50 chum salmon may come from marine waters. The permit holders will find that in no individual location will they be allowed to take all 100 salmon. They will be required to spread their harvest over two or more locations so that fishing impacts will be spread over a broader area. The escapement goal at the Eldorado River is 6,000 to 9,200 chum salmon. The escapement at the Eldorado River tower is 1,200 chum salmon and 4,000 pink salmon through June 29. The counting tower has been operational since the mid-90s and this is the highest number of chums and pinks past the tower by this date. In only 1999 was the lower end of the escapement goal for chum salmon not achieved. On June 29, an aerial survey confirmed that salmon are continuing to move into the Eldorado, Flambeau and Bonanza Rivers and Safety Sound. Based on the early

Appendix G7. Emergency Orders issued during 2002.

Emergency Order Number	Effective Date	Action Taken	Comments
			strength of the chum salmon run into the Eldorado and Flambeau Rivers, and strong chum salmon escapements to date in the nearby Golovin and Elim Subdistricts, the department believes that the chum salmon escapement goals will likely be reached in the Eldorado and Flambeau Rivers in 2002. Allowing a Tier II chum salmon opening in the Eldorado and Flambeau Rivers will allow fishers an opportunity to harvest salmon earlier in the run and during the better drying conditions of early July. Tier II subsistence permit holders are limited to 200 total salmon from the fresh waters west of the Safety Sound bridge and the Eldorado and Flambeau Rivers of which only 50 may be chum salmon.
3-S-Z-03-02	July 2, 2002	This emergency order opens subsistence beach seine fishing for pink salmon in all fresh waters east of Cape Nome to subsistence fishing for 24 hours from 6:00 p.m. Tuesday, July 2, 2002 until Wednesday, 6:00 p.m. July 3, 2002. The area open includes Safety Sound, Flambeau, Eldorado, Bonanza, and Solomon Rivers. Beach seining will be conditional in that all chum salmon caught must be immediately returned to the water. No chum salmon may be kept as Tier II rules remain in effect for subsistence chum salmon fishing in Subdistrict 1.	Once again, the waters of the Nome Subdistrict are being closed to provide chum salmon spawning stock and allow a limited Tier II fishery. In even-numbered years pink salmon returns are often much stronger than odd-numbered years and allow opportunity for subsistence fishing. To protect the chum salmon and still allow for subsistence fishing the use of beach seines allows the harvest of pink salmon, and chum salmon to be released without harm. No escapement goals have been established for pink salmon in Nome Subdistrict streams east of Cape Nome. Escapement goals in the Nome River and the Niukluk River are 13,000 pink salmon and 8,400 pink salmon. The escapement at the Eldorado River tower through June 30 is 6,500 pink salmon. The counting tower has been operational since the mid-90s and this is the highest number of pinks past the tower by this date. On June 29, an aerial survey confirmed that salmon are continuing to move into the Eldorado, Flambeau and Bonanza Rivers and Safety Sound. Salmon have also been reported in the Solomon River. Based on the early strength of the pink salmon run into the Eldorado and Flambeau Rivers, and strong pink salmon escapements to date in the nearby Golovin and Elim Subdistricts, the department believes that the pink salmon run is exceptionally strong in 2002. Allowing a Tier I pink salmon opening in the fresh waters east of Cape Nome Rivers will allow fishers an opportunity to harvest salmon earlier in the run and should not jeopardize escapement. Tier I subsistence permit holders are limited in each fresh water area in the amount of salmon that can be taken.
3-S-Z-04-02	July 2, 2002	This emergency order opens subsistence fishing for pink salmon with hook and line in all marine waters and all fresh waters east of Cape Nome to subsistence fishing from 6:00 p.m. Tuesday, July 2, 2002 until Thursday, August 1, 2002. The area open includes Safety Sound, Flambeau, Eldorado, Bonanza, and Solomon Rivers. Fishing with hook and line will be conditional in that all chum salmon caught must be immediately returned to the water. No chum salmon may be kept as Tier II rules remain in effect for subsistence chum salmon fishing in Subdistrict 1.	In even-numbered years pink salmon returns are often much stronger than odd-numbered years and allow opportunity for subsistence fishing. To protect the chum salmon and still allow for subsistence fishing, the use of hook and line will allow chum salmon to be released back to the water if captured by hook and line. No escapement goals have been established for pink salmon in Nome Subdistrict streams east of Cape Nome. The escapement goal in the Nome River is 13,000 pink salmon and in the Niukluk River in the nearby Golovin Subdistrict it is 8,400 pink salmon. The escapement at the Eldorado River tower through June 30 is 6,500 pink salmon. The counting tower has been operational since the mid-90s and this is the highest number of pinks past the tower by this date. On June 29, an aerial survey confirmed that salmon are continuing to move into the Eldorado, Flambeau and Bonanza Rivers and Safety Sound. Salmon have also been reported in the Solomon River. Based on the early strength of the pink salmon run into the Eldorado and Flambeau Rivers, and strong pink salmon escapements to date in the nearby Golovin and Elim Subdistricts, the department believes that the pink salmon run is exceptionally strong in 2002. Allowing a Tier I pink salmon opening in the marine and fresh waters, east of Cape Nome, will allow fishers an opportunity to harvest salmon earlier in the run and should not jeopardize escapement. Tier I subsistence fishers will need to be in possession of a subsistence permit and permit holders are limited in the marine water area and each fresh water area in the amount of salmon that can be taken. Salmon catch limits and areas open will be provided to fishers when they pick up their permits at the M — Fish & Game office.
3-S-4	July 4, 2002	This emergency order opens the fresh waters west of the Safety Sound bridge and the Eldorado and Flambeau	salmon are beginning to arrive in local waters at this time. The chum salmon stock of th Subdistrict is judged insufficient to support the full subsistence need of the residents of the Nome Subdistrict.

Appendix G7. Emergency Orders issued during 2002.

Emergency Order Number	Effective Date	Action Taken	Comments
		Rivers to Tier II subsistence fishing for 48 hours from 12:00 p.m. Thursday, July 4, 2002 until Saturday, 12:00 p.m. July 6, 2002. Only Tier II permit holders will be allowed to subsistence fish for salmon in the waters west of the Safety Sound bridge and the Eldorado and Flambeau Rivers.	Tier II fishing rules will allow those residents determined to be the longest users and the most dependent users of the salmon to meet their harvest needs. Even-year pink salmon returns are typically very abundant, and the pink run is building earlier than expected which have allowed for targeted harvests with a 24-hour beach seine period earlier in the week. A Tier I subsistence opening with restricted mesh size to target pink salmon is planned for later in the week in marine waters. Subsistence fishing for Tier II permit holders began on June 25 with a 72-hour period in the marine waters east of Cape Nome. Fishers reported good catches of chum and pink salmon. A second 72-hour subsistence fishing period began on July 2. Although Tier II fishers are able to harvest 100 chum salmon only 50 chum salmon may come from marine waters. The permit holders will find that in no individual location will they be allowed to take all 100 salmon. They will be required to spread their harvest over two or more locations so that fishing impacts will be spread over a broader area. This will be the second fresh water opening for Tier II permit holders. There was a 24-hour period Tier II subsistence fishing beginning on July 1 in the Eldorado and Flambeau Rivers, however weather was poor and not many Tier II permit holders participated. The escapement goal at the Eldorado River is 6,000 to 9,200 chum salmon. The escapement at the Eldorado River tower is 7,000 chum salmon and 10,000 pink salmon through July 2. The counting tower has been operational since the mid-90s and this is the highest number of chums and pinks past the tower by this date. In only 1999 was the lower end of the escapement goal for chum salmon not achieved. The escapement goal on the Flambeau River is 4,100 to 6,300 chum salmon. On July 3, an aerial survey confirmed that salmon are continuing to move into the Eldorado, Flambeau and Bonanza Rivers and Safety Sound. Based on the early strength of the chum salmon run into the Eldorado and Flambeau Rivers, and strong chum salmon escapements to date in the nearby Golovin and Elim Subdistricts, the department believes that the chum salmon escapement goals will likely be reached in the Eldorado and Flambeau Rivers in 2002. Allowing a Tier II chum salmon opening in the Eldorado and Flambeau Rivers will allow fishers an opportunity to harvest salmon earlier in the run and during the better drying conditions of early July. This subsistence fishing period should not jeopardize reaching escapement in the Eldorado and Flambeau Rivers. Tier II subsistence permit holders are limited to 200 total salmon from the fresh waters west of the Safety Sound bridge and the Eldorado and Flambeau Rivers of which only 50 may be chum salmon.
3-S-Z-06-02	July 6, 2002	This emergency order provides two options for Tier I subsistence fishers. Option 1 provides for subsistence beach seine fishing for pink salmon in all fresh waters east of Cape Nome to subsistence fishing for 24 hours from 12:00 p.m. Saturday, July 6, 2002 until 12:00 p.m. Sunday, July 7, 2002. The area open includes Safety Sound, Flambeau, Eldorado, Bonanza, and Solomon Rivers. Beach seining will be conditional in that all chum salmon caught must be immediately returned to the water. Option 2 allows subsistence pink salmon gillnet fishing in marine waters east of Cape Nome for 24 hours from 12:00 p.m. Saturday, July 6, 2002 until Sunday, 12:00 p.m. July 7, 2002. Only gillnets with a mesh size no larger than four and one-half inches stretch measure will be allowed.	To protect the chum salmon in fresh waters and still allow for subsistence fishing, beach seines will be used to harvest pink salmon, and allow chum salmon to be returned to the water unharmed. To reduce the incidental catch of chum salmon in marine waters, gillnets will be restricted to four and one-half inch stretch measure. No escapement goals have been established for pink salmon in Nome Subdistrict streams east of Cape Nome. The escapement goal in the Nome River is 13,000 pink salmon and the Niukluk River in the nearby Golovin Subdistrict is 8,400 pink salmon. The escapement at the Eldorado River tower through July 4 is 20,000 pink salmon. The counting tower has been operational since the mid-90s and this is the highest number of pinks past the tower by this date. On July 3, an aerial survey confirmed that salmon are continuing to move into the Eldorado, Flambeau and Bonanza Rivers and Safety Sound. Salmon have also been reported in the Solomon River. Based on the early strength of the pink salmon run into the Eldorado and Flambeau Rivers, and strong pink salmon escapements to date in the nearby Golovin and Elim Subdistricts, the department believes that the pink salmon run is exceptionally strong in 2002. Allowing a Tier I pink salmon beach seine opening in the fresh waters east of Cape Nome, and a restricted gillnet mesh size opening in the marine waters east of Cape Nome, will allow fishers an opportunity to harvest salmon earlier in the run and should not jeopardize escapement. Tier I subsistence permit holders are limited in the amount of salmon that can be taken in each fresh water area and in the marine waters. Salmon catch limits and areas open will be provided to fishers when they pick up their permits at the Nome Fish & Game office.
3-S-Z-07-02	July 8, 2002	This emergency order provides for two 48-hour subsistence beach seine fishing periods for pink salmon in all fresh waters east of Cape Nome from 6:00 p.m. Monday, July 8, 2002 until 6:00 p.m. Wednesday, July 10, 2002, and from 6:00 p.m. Thursday, July 11, 2002 until 6:00 p.m. Saturday, July 13, 2002. The area open	To protect the chum salmon in fresh waters and still allow for subsistence fishing, beach seines will be used to harvest pink salmon, and allow chum salmon to be returned to the water unharmed. No escapement goals have been established for pink salmon in Nome Subdistrict streams east of Cape Nome. The escapement goal in the Nome River is 13,000 pink salmon and the Niukluk River in the nearby Golovin Subdistrict is 8,400 pink salmon. The escapement at the Eldorado River tower through July 6 is 35,000 pink salmon. The counting tower has been operational since the mid-90s and this is the highest number of pinks past the tower by this date. On

Appendix G7. Emergency Orders issued during 2002.

Emergency Order Number	Effective Date	Action Taken	Comments
		includes Safety Sound, Flambeau, Eldorado, Bonanza, and Solomon Rivers. Beach seining will be conditional in that all chum salmon caught must be immediately returned to the water.	July 3, an aerial survey confirmed that salmon are continuing to move into the Eldorado, Flambeau and Bonanza Rivers and Safety Sound. Salmon have also been reported in the Solomon River. Based on the early strength of the pink salmon run into the Eldorado and Flambeau Rivers, and strong pink salmon escapements to date in the nearby Golovin and Elim Subdistricts, the department believes that the pink salmon run is exceptionally strong in 2002. Allowing a Tier I pink salmon beach seine opening in the fresh waters east of Cape Nome will allow fishers an opportunity to harvest salmon earlier in the run and should not jeopardize escapement. Tier I subsistence permit holders are limited in the amount of salmon that can be taken in each fresh water area and in the marine waters. Salmon catch limits and areas open will be provided to fishers when they pick up their permits at the Nome Fish & Game office.
3-S-Z-08-02	July 11, 2002	This emergency order opens the fresh waters west of the Safety Sound bridge and the Eldorado and Flambeau Rivers to Tier II subsistence fishing for 48 hours from 6:00 p.m. Thursday, July 11, 2002 until Saturday, 6:00 p.m. July 13, 2002. Only Tier II permit holders will be allowed to subsistence fish for salmon in the waters west of the Safety Sound bridge and the Eldorado and Flambeau Rivers.	Tier II fishing rules will allow those residents determined to be the longest users and the most dependent users of the salmon to meet their harvest needs. Even-year pink salmon returns are typically very abundant, and the pink run is building earlier than expected which have allowed for targeted harvests with a 24-hour beach seine period earlier in the week. A Tier I subsistence opening with restricted mesh size to target pink salmon is planned for later in the week in marine waters. Subsistence fishing for Tier II permit holders began on June 25 with a 72-hour period in the marine waters east of Cape Nome, and 72-hour periods have continued weekly. Although Tier II fishers are able to harvest 100 chum salmon only 50 chum salmon may come from marine waters. The permit holders will find that in no individual location will they be allowed to take all 100 salmon. They will be required to spread their harvest over two or more locations so that fishing impacts will be spread over a broader area. This will be the third fresh water opening for Tier II permit holders. The escapement goal at the Eldorado River is 6,000 to 9,200 chum salmon. The escapement at the Eldorado River tower is 4,700 chum salmon and 47,000 pink salmon through July 8. The counting tower has been operational since the mid-90s and this is the highest picks past the tower by this date. Chum salmon passage is average and similar to all years in which the escapement goal range was achieved. The escapement goal on the Flambeau River is 4,100 to 6,300 chum salmon. On July 3, an aerial survey confirmed that salmon are continuing to move into the Eldorado, Flambeau and Bonanza Rivers and Safety Sound. Based on the strength of the chum salmon run into the Eldorado and Flambeau Rivers, and strong chum salmon escapements to date in the nearby Golovin and Elim Subdistricts, the department believes that the chum salmon escapement goals will likely be reached in the Eldorado and Flambeau Rivers in 2002. Allowing a Tier II chum salmon period using beach seine and gillnets in the Eldorado and Flambeau Rivers will allow fishers an opportunity to harvest both chum and pink salmon with greater efficiency. This subsistence fishing period should not jeopardize reaching escapement in the Eldorado and Flambeau Rivers. Tier II subsistence permit holders are limited to 200 total salmon from the fresh waters west of the Safety Sound bridge and the Eldorado and Flambeau Rivers of which only 50 may be chum salmon.
3-S-Z-09-02	July 12, 2002	This emergency order allows subsistence pink salmon gillnet fishing in marine waters east of Cape Nome for 48 hours from 6:00 p.m. Friday, July 12, 2002 until Sunday, 6:00 p.m. July 14, 2002. Only gillnets with a mesh size no larger than four and one-half inches stretch measure will be allowed.	To protect the chum salmon in marine waters and still allow for subsistence fishing, gillnets will be restricted to four and one-half inch stretch measure. The use of the smaller mesh "pink gear" will help to reduce the incidental catch of chum salmon. No escapement goals have been established for pink salmon in Nome Subdistrict streams east of Cape Nome. The escapement goal in the Nome River is 13,000 pink salmon and the Ninkluk River in the nearby Golovin Subdistrict is 8,400 pink salmon. The escapement at the Eldorado River tower through July 10 is 61,000 pink salmon. The counting tower has been operational since the mid-90s and this is the highest number of pinks past the tower by this date. On July 3, an aerial survey confirmed that salmon are continuing to move into the Eldorado, Flambeau and Bonanza Rivers and Safety Sound. Salmon have also been reported in the Solomon River. Based on the early strength of the pink salmon run into the Eldorado and Flambeau Rivers, and strong pink salmon escapements to date in the nearby Golovin and Elim Subdistricts, the department believes that the pink salmon run is exceptionally strong in 2002. Allowing a Tier I fishing period with restricted gillnet mesh in the marine waters east of Cape Nome, will allow fishers an opportunity to harvest salmon earlier in the run and should not jeopardize escapement. Tier I subsistence permit [illegible] are limited to 200 total salmon for the season in the marine waters of the Nome Subdi [illegible] only can harvest 50 chum salmon and 20 coho salmon.

Appendix G7. Emergency Orders issued during 2002.

Emergency Order Number	Effective Date	Action Taken	Comments
3-S-Z-10-02	July 15, 2002	This emergency order provides for two 48-hour subsistence beach seine and gillnet fishing periods for salmon in all fresh waters east of Cape Nome, except the Solomon River, from 6:00 p.m. Monday, until 6:00 p.m. Wednesday, and from 6:00 p.m. Thursday, until 6:00 p.m. Saturday. The area open includes Safety Sound, Flambeau, Eldorado, and Bonanza Rivers. The Solomon River and Sinuk River will be open during the same two 48-hour fishing periods as above, but will be open to beach seining only. Beach seining in the Solomon and Sinuk Rivers will be conditional in that all chum salmon caught must be immediately returned to the water. Hook and line is a legal gear for the openings.	With the exception of the Solomon River the rivers east of Cape Nome have shown adequate chum salmon escapement to date. Therefore a Tier I fishery allowing the taking of chum salmon in areas of adequate chum salmon escapement is permissible. In even-numbered years pink salmon returns are often much stronger than odd-numbered years and allow opportunity for subsistence fishing. To protect the chum salmon in fresh waters where escapement has not been met and still allow for subsistence fishing, beach seines will be used to harvest pink salmon, and allow chum salmon to be returned to the water unharmed. In both the Solomon and Sinuk River aerial surveys have shown large numbers of pink salmon, but chum salmon have been below the escapement goals in those rivers to date. The Eldorado counting tower has been operational since the mid-90s and this is the highest number of pinks past the tower by this date. On July 12, an aerial survey confirmed that pink salmon are continuing to move into the Nome Subdistrict rivers in large numbers, especially east of Cape Nome and in the Sinuk River. The Eldorado, Flambeau and Bonanza Rivers were nearing their escapement goal of chum salmon. Although the aerial survey count on the Sinuk River was over 18,000 pink salmon, the chum salmon count was 760. The chum salmon count would be below the escapement goal of 4,000 to 6,200 chum salmon in the Sinuk River. An aerial survey of the lower Solomon River showed several thousand pink salmon, but few chum salmon. Based on the strength of the pink salmon run into the streams east of Cape Nome and the Sinuk River, the department believes that the pink salmon run is exceptionally strong in 2002. Allowing a Tier I pink salmon beach seine opening in the fresh waters east of Cape Nome and the Sinuk River will allow fishers an opportunity to harvest salmon earlier in the run and should not jeopardize escapement. Chum salmon may be retained by Tier I permit holders fishing in Safety Sound, the Bonanza Channel, the Eldorado, Flambeau, and Bonanza Rivers. Tier I subsistence permit holders are limited to 200 total salmon that can be taken in each fresh water area and at this time all chum salmon captured in the Solomon and Sinuk River must be returned to the water. Hook and line is also a legal gear for the Tier I fishing periods with the same restrictions on the taking of chum salmon in the areas where beach seining requires chum to be returned to the water.
3-S-Z-11-02	July 15, 2002	This emergency order opens subsistence fishing with hook and line in all marine waters and all fresh waters of the Nome Subdistrict to subsistence fishing from 12:01 a.m. Tuesday, July 16, 2002 until Thursday, August 1, 2002, except the Snake River. Fishing with hook and line will be conditional in that all chum salmon caught must be immediately returned to the water in all marine waters, the Solomon River and all freshwaters west of Cape Nome. No chum salmon may be kept in these areas as Tier II rules remain in effect for subsistence chum salmon fishing in Subdistrict 1. The subsistence boundaries as stated in regulation are in effect for all freshwaters and subsistence fishers may only fish in these areas.	Therefore a Tier I fishery allowing the taking of chum salmon in areas of adequate chum salmon escapement has been allowed in those areas. In even-numbered years pink salmon returns are often much stronger than odd-numbered years and allow opportunity for subsistence fishing. To protect the chum salmon in fresh waters where escapement has not been met and still allow for subsistence fishing, hook and line will be used to harvest pink salmon, and allow chum salmon to be returned to the water unharmed. No escapement goals have been established for pink salmon in Nome Subdistrict streams east of Cape Nome. The escapement goal in the Nome River is 13,000 pink salmon and the Niukluk River in the nearby Golovin Subdistrict is 8,400 pink salmon. On July 12, an aerial survey confirmed that pink salmon are continuing to move into the Nome Subdistrict rivers in large numbers, especially east of Cape Nome and in the Sinuk River. The Eldorado, Flambeau and Bonanza Rivers were nearing their escapement goal of chum salmon. Tower counts through July 16 have the Eldorado River at over 7,000 chum salmon which is near the midpoint of the escapement goal range. Pink salmon escapement on the Eldorado River is 95,000 fish which is a record for this date. Pink salmon escapement past the Nome River weir through July 14 is 8,700 and should reach the 13,000 goal in a few days. Chum salmon escapement at the Nome River is lagging with 700 chum salmon past the weir which is below average for this date. Although the aerial survey count on the Sinuk River was over 18,000 pink salmon, the chum salmon count was 760. The chum salmon count would be below the escapement goal of 4,000 to 6,200 chum salmon in the Sinuk River. An aerial survey of the lower Solomon River showed several thousand pink salmon, but few chum salmon. The Snake River salmon escapement is 1,100 pink salmon and 1,200 chum salmon past the tower through July 14. The pink salmon escapement is well below average at this time. The chum salmon escapement is above average and a Tier II fishery may be possible later in the week. Based on the strength of the pink salmon run into the streams of the Nome Subdistrict excluding the Snake River, the department believes that the pink salmon run is exceptionally strong in 2002. Allowing Tier I hook and line fishing in marine waters and freshwaters of the Nome Subdistrict, excluding the Snake River, will allow fishers an opportunity to harvest salmon and should not jeopardize escapement. Chum salmon may be retained by Tier I permit holders fishing in Safety Sound, the Bonanza Channel, the Eldorado, Flambeau, and Bonanza Rivers. Tier I subsistence permit holders are limited to 200 total salmon that can be taken in each fresh water area and at this time all chum salmon captured in the Solomon and Sinuk River must be returned to the water.

Appendix G7. Emergency Orders issued during 2002.

Emergency Order Number	Effective Date	Action Taken	Comments
3-S-Z-12-02	July 18, 2002	This emergency order includes the Nome River in the two 48-hour subsistence beach seine fishing periods weekly for salmon, from 6:00 p.m. Monday, until 6:00 p.m. Wednesday, and from 6:00 p.m. Thursday, until 6:00 p.m. Saturday. Beach seining in the Nome River will be conditional in that all chum salmon caught must be immediately returned to the water. This emergency order also opens hook and line subsistence fishing.	For the past decade the chum salmon fisheries of the Nome Subdistrict have been weak. Although limited rebuilding has occurred the chum salmon returns are far weaker than those prior to 1987. Once again, the waters of the Nome Subdistrict have been closed to provide chum salmon spawning stock and allow a limited Tier II fishery. The escapement at the Nome weir through July 16 was 12,000 pink salmon and 800 chum salmon. The escapement goals at the weir are 13,000 pink salmon and 2,900 to 4,300 chum salmon. At this time the pink salmon goal should easily be met, but reaching even the low end of the chum salmon goal is doubtful. Therefore beach seining and hook and line fishing for pink salmon will be allowed with the condition that any chum salmon captured must be immediately returned to the water. This emergency order adds Nome River to the list of rivers in E.O. 3-S-Z-10-02 that are open to the weekly Tier I beach seining periods of 6 p.m. Monday until 6 p.m. Wednesday and from 6 p.m. Thursday until 6 p.m. Saturday. Hook and line subsistence fishing is also open.
3-S-Z-13-02	July 18, 2002	This emergency order opens the fresh waters of the Snake River to weekly Tier II subsistence fishing periods from 6:00 p.m. Monday until 6 p.m. Wednesday and from 6 p.m. Thursday until 6 p.m. Saturday. Only Tier II permit holders will be allowed to subsistence fish for salmon in the waters downstream of the Sunset Creek on the Snake River. Hook and line may also be used to capture chum salmon.	For the past decade the chum salmon fisheries of the Nome Subdistrict have been weak. Although limited rebuilding has occurred the chum salmon returns are far weaker than those prior to 1987. Once again, the waters of the Nome Subdistrict were closed at the beginning of the season to provide chum salmon spawning stock. The chum salmon migration into the rivers begins with the rivers east of Cape Nome reaching their escapement goal before the rivers to the west. To date most rivers east of Cape Nome have reached their escapement goal and the Snake River has now passed the low end of its escapement goal range. The escapement goal range on the Snake River is 1,600 to 2,500 chum salmon. Escapement past the tower is 1,800 chum and 2,400 pink salmon. Tier II fishing rules will allow those residents determined to be the longest users and the most dependent users of the salmon to meet their harvest needs. Even-year pink salmon returns are typically very abundant, but on the Snake River the pink run has been a record low when compared with recent even-year escapements. A Tier II opening will not jeopardize escapement needs and it will provide for subsistence opportunity. Hook and line will also be allowed as a method of harvest for those who desire to take less salmon. Subsistence limits are 20 chum and 20 coho salmon and no more than 100 total salmon.
3-S-Z-14-02	July 19, 2002	This emergency order allows subsistence pink salmon gillnet fishing in marine waters east of Cape Nome from 6:00 p.m. Friday, July 19, 2002 until Thursday August 1, 2002. Only gillnets with a mesh size no larger than four and one-half inches stretch measure will be allowed.	For the past decade the chum salmon fisheries of the Nome Subdistrict have been weak. Although limited rebuilding has occurred the chum salmon returns are far weaker than those prior to 1987. Once again, the waters of the Nome Subdistrict were closed to provide chum salmon spawning stock and allow a limited Tier II fishery. Salmon escapement monitoring projects in the Nome Subdistrict show both chum and pink salmon runs vary greatly depending on location. Chum salmon in the rivers east of Cape Nome are on track to reach near average escapement, but west of Cape Nome some rivers have had poorer escapements. The Nome River chum escapement is very poor to date. Pink salmon escapements are strong in rivers east of Cape Nome, but have been lagging west of Cape Nome. Pink salmon escapements are ranging from over 100,000 in the Eldorado River east of Cape Nome to 2,700 at the Snake River. To protect the chum salmon in marine waters that may still be bound for rivers west of Cape Nome and still allow for subsistence fishing, gillnets will be restricted to four and one-half inch stretch measure. The use of the smaller mesh "pink gear" will help to reduce the incidental catch of chum salmon and allow fishers to catch pink salmon which are more plentiful. Tier I subsistence permit holders are limited to 200 total salmon for the season in the marine waters of the Nome Subdistrict and only can only harvest 50 chum salmon and 20 coho salmon.
3-S-Z-15-02	July 22, 2002	This emergency order opens all freshwater subsistence areas in the Nome Subdistrict to the regular two 48-hour subsistence fishing periods weekly for salmon, from 6:00 p.m. Monday, until 6:00 p.m. Wednesday, and from 6:00 p.m. Thursday, until 6:00 p.m. Saturday. Gillnets will not be allowed to be used in the Nome River. Beach seining and hook and line fishing in the Nome River will be conditional in that all chum salmon caught must be immediately returned to the water	For the past decade the chum salmon fisheries of the Nome Subdistrict have been weak. Although limited rebuilding has occurred the chum salmon returns are far weaker than those prior to 1987. Once again, the waters of the Nome Subdistrict have been closed to provide chum salmon spawning stock and allow a limited Tier II fishery. Salmon escapement monitoring projects in the Nome Subdistrict show both chum and pink salmon runs vary greatly depending on location. To date the chum and pink escapement in the Nome S[illegible]trict rivers east of Cape Nome has been better than the rivers west of Cape Nome. The es[illegible]ent at the [illegible]eir through July 20 was 29,000 pink salmon and 1,100 chum salmon. The escapement [illegible] the weir [illegible]00 pink salmon and 2,900 to 4,300 chum salmon. Few chum salmon are now entering [illegible]e River and it will have less than half its low end escapement goal. The nearby Snake River has met its escapement goal

Appendix G7. Emergency Orders issued during 2002.

Emergency Order Number	Effective Date	Action Taken	Comments
			and other rivers in the district have reached their goal or were near to reaching the goal. In the Nome River many chum salmon to do not move above the subsistence fishing area. As the pink escapement has been reached in the Nome River fishing will be allowed with only beach seines or hook and line and all chum salmon captured must be returned to the water. In the other rivers most of the chum salmon have moved above the subsistence fishing area and with escapement being met and few chums still entering the rivers allowing the harvest of chum salmon will not jeopardize escapement.
3-S-Z-16-02	July 25, 2002	This emergency order opens the Unalakleet and Shaktoolik Subdistricts to commercial salmon fishing for a single 24 hour period beginning at 6 p.m. Thursday, July 25. The period will be from 6 p.m. Thursday until 6 p.m. Friday. Only nets with a mesh size no larger than 6 inches will be allowed.	There has been no commercial fishing in Eastern Norton Sound this year. There was a weak chinook salmon run. The chum salmon run was slightly better, but escapement indicators were average to below average even with no commercial fishing. This week typically marks the tail end of the chum salmon run and the beginning of the coho salmon run. This period is scheduled to test the abundance of coho salmon. Fishing effort is expected to be below average as many salmon permit holders are participating in the Norton Sound crab fishery. The Unalakleet test net project has had chum salmon catches above average through the season. Having a commercial period will allow fishers to harvest some late returning chum salmon and some early arriving coho salmon and should not jeopardize subsistence fishing or escapement.
3-S-Z-17-02	July 29, 2002	This emergency order opens the Unalakleet and Shaktoolik Subdistricts to commercial salmon fishing for a single 24 hour period beginning at 6 p.m. Monday, July 29. The period will be from 6 p.m. Monday until 6 p.m. Tuesday. Only nets with a mesh size no larger than 6 inches will be allowed.	The first 24 hour commercial period had a harvest of 1 king salmon, 111 chum salmon and 6 coho salmon for 2 permit holders fishing in the Unalakleet Subdistrict. No one fished in the Shaktoolik Subdistrict. The number of permit holders fishing and the catch was well below average. The catch per unit of effort (CPUE) was average for chum salmon and well below average for coho salmon. It is early in the coho salmon run and the test net and counting tower are beginning to see coho salmon which is expected the last week of July. With limited fishing effort another commercial opening will help to judge the strength of the early portion of the coho run and should not jeopardize subsistence fishing or escapement.
3-S-Z-18-02	July 29, 2002	This emergency order opens all marine waters in the Nome Subdistrict to a weekly schedule of subsistence fishing from 6 p.m. Monday until 6p.m. Saturday and opens the freshwater subsistence areas in the Nome Subdistrict to the regular two 48-hour subsistence fishing periods weekly for salmon, from 6:00 p.m. Monday, until 6:00 p.m. Wednesday, and from 6:00 p.m. Thursday, until 6:00 p.m. Saturday. The subsistence harvest area in the Nome River will be restricted to no upstream fishing from the regulation marker near the VOR site.	The chum and pink salmon migration into the rivers of the Nome Subdistrict are essentially over. Coho salmon are now entering the rivers with increasing numbers. This emergency order marks the transition from pink and chum salmon management to coho salmon management. The Nome River weir is starting to count more coho salmon past the weir and although it is still very early in run the escapement appears normal. The standard fishing schedule will be in effect and the department will continue to monitor the escapement and adjust fishing times accordingly. The normal subsistence harvest areas will be open except for the Nome River. On the Nome River the upper boundary will be moved to downriver from Osborn Creek to near the VOR site. This action is to protect spawning chum salmon downriver of Osborn Creek. The chum salmon escapement was less than half the minimum escapement goal of 2,900 fish. Through July 29 the escapement past the Nome River weir was 1,300 chum salmon. The chum salmon run is essentially over and during the last four days less than 10 chum salmon a day have passed through the weir.
3-S-Z-19-02	August 1, 2002	This emergency order opens the Unalakleet and Shaktoolik Subdistricts to commercial salmon fishing for a single 24 hour period beginning at 6 p.m. Thursday, August 1. The period will be from 6 p.m. Thursday until 6 p.m. Friday. Only nets with a mesh size no larger than 6 inches will be allowed.	The second 24 hour commercial period had a harvest of 79 chum and 76 coho salmon for 2 fishers in the Unalakleet Subdistrict, and 20 chum and 65 coho salmon for 2 fishers in the Shaktoolik Subdistrict. The number of permit holders fishing and the catch was well below average. The catch per unit of effort (CPUE) was average for both chum salmon and coho salmon. It is early in the coho salmon run and the test net and counting tower are beginning to see coho salmon which is expected the last week of July. With limited fishing effort another commercial opening will help to judge the strength of the early portion of the coho run and should not jeopardize subsistence fishing or escapement.
3-S-Z-20-02	August 5, 2002	This emergency order opens the Unalakleet and Shaktoolik Subdistricts to commercial salmon fishing for a single 24 hour period beginning at 6 p.m. Monday, August 5. The period will be from 6 p.m. Monday until 6 p.m. Tuesday. Only nets with a mesh size no larger than 6 inches will be allowed.	The third 24-hour commercial period had a harvest of 122 coho and 34 chum salmon for 2 fishers in the Unalakleet Subdistrict, and 73 coho and 42 chum salmon for 2 fishers in the Shaktoolik Subdistrict. The number of permit holders fishing and the catch was well below average. The catch per unit of effort (CPUE) was average for both chum salmon and coho salmon. However, with little fishing effort and only a 24-hour fishing period instead of the usual 48-hour period the CPUE would be expected to be above average in a normal run. It is still early in the coho salmon run and the test net and counting tower crews are beginning to observe more coho salmon. Water levels have been low and weather has been calm which may be slowing the

Appendix G7. Emergency Orders issued during 2002.

Emergency Order Number	Effective Date	Action Taken	Comments
			movement of coho salmon into the rivers. Historically the midpoint of the coho run at the test net is August 14 and the midpoint at the North River tower is less than a week later. With limited fishing effort another commercial opening will help to judge if the coho run strength is building and should not jeopardize subsistence fishing or escapement.
3-S-Z-21-02	August 8, 2002	This emergency order opens the Unalakleet and Shaktoolik Subdistricts to commercial salmon fishing for a single 24 hour period beginning at 6 p.m. Thursday, August 8. The period will be from 6 p.m. Thursday until 6 p.m. Friday. Only nets with a mesh size no larger than 6 inches will be allowed.	The fourth 24-hour commercial period had a harvest of 147 coho and 26 chum salmon for 3 fishers in the Unalakleet Subdistrict, and 83 coho and 51 chum salmon for 4 fishers in the Shaktoolik Subdistrict. The number of permit holders fishing and the catch was well below average. Also, the catch per unit of effort (CPUE) was below average for coho salmon. However, with little fishing effort and only a 24-hour fishing period instead of the usual 48-hour period the CPUE would be expected to be above average in a normal run. Stormy weather resulted in the permit holders fishing less time than the majority of the fishing opening and likely affected the CPUE. It is still early in the coho salmon run and the test net and counting tower crews are beginning to observe more coho salmon. Water levels have been low which may be slowing the movement of coho salmon into the rivers. Historically the midpoint of the coho run at the test net is August 14 and the midpoint at the North River tower is less than a week later. With limited fishing effort another commercial opening, hopefully under favorable weather conditions will help to judge if the coho run strength is building and should not jeopardize subsistence fishing or escapement.
3-S-Z-22-02	August 12, 2002	This emergency order opens the Unalakleet and Shaktoolik Subdistricts to commercial salmon fishing for a single 24 hour period beginning at 6 p.m. Monday, August 12. The period will be from 6 p.m. Monday until 6 p.m. Tuesday. Only nets with a mesh size no larger than 6 inches will be allowed.	The fifth 24-hour commercial period had a harvest of 560 coho and 58 chum salmon for 3 fishers in the Unalakleet Subdistrict, and 241 coho and 104 chum salmon for 4 fishers in the Shaktoolik Subdistrict. The number of permit holders fishing and the catch was well below average. The catch per unit of effort (CPUE) was average for coho salmon in the Shaktoolik Subdistrict and above average in the Unalakleet Subdistrict. With little fishing effort and only a 24-hour fishing period instead of the usual 48-hour period the CPUE would be expected to be above average in a normal run. Historically the commercial harvest is now at the midpoint in a normal run. This year the run is possibly late and weak. To date the test net catches have been below average, but recently have been increasing and may soon reach average. The North River tower coho salmon escapement counts have been below average also. With limited fishing effort expected to continue because of low catches and low prices continuing with the conservative fishing schedule of two 24-hour periods a week rather than the normal two 48-hour periods is prudent. This conservative fishing schedule should not jeopardize subsistence fishing or escapement.
3-S-Z-23-02	August 15, 2002	This emergency order opens the Unalakleet and Shaktoolik Subdistricts to commercial salmon fishing for a single 24 hour period beginning at 6 p.m. Thursday, August 15. The period will be from 6 p.m. Thursday until 6 p.m. Friday. Only nets with a mesh size no larger than 6 inches will be allowed.	The recent 24-hour commercial period had a harvest of 66 coho and 10 chum salmon for 2 fishers in the Unalakleet Subdistrict, and 214 coho and 62 chum salmon for 6 fishers in the Shaktoolik Subdistrict. The number of permit holders fishing and the catch was well below average. The catch per unit of effort (CPUE) was below average for coho salmon in both Subdistricts. With little fishing effort and only a 24-hour fishing period instead of the usual 48-hour period the CPUE would be expected to be above average in a normal run. Historically the commercial harvest is now past the midpoint in a run with normal run timing. This year the run is possibly late and weak. To date the test net catches have been below average, but recently catches have been increasing. The North River tower coho salmon escapement counts have been below average also. With limited fishing effort expected to occur, because of low catches and low prices, continuing with the conservative fishing schedule of two 24-hour periods a week rather than the normal two 48-hour periods is prudent. This conservative fishing schedule should not jeopardize subsistence fishing or escapement.
3-S-Z-24-02	August 16, 2002	This emergency order closes the marine and fresh waters of the Port Clarence and Nome Subdistrict to subsistence salmon fishing.	Coho salmon escapements on the southern Seward Peninsula indicate very weak returns. Escapement counts through August 15 are record lows at the Pilgrim, Nome, and Snake rivers. Cumulative passage at the Pilgrim River tower is 144 cohos, at the Nome weir is 21 cohos and at the Snake weir is 1 coho. The Eldorado River weir count is well below average with 57 cohos counted through August 15. No cohos have passed at Eldorado [illegible] days. On August 13, an aerial survey of the Snake River counted 57 cohos between the r[illegible]mouth and [illegible]r and an aerial survey on the Nome River counted 400 cohos between the river mouth [illegible]weir. [illegible]cally, even late runs have had significantly larger escapements in fresh waters by this d[illegible]is date there is little hope for achieving an average coho salmon escapement. Therefore, subsistence salmon gillnet

Appendix G7. Emergency Orders issued during 2002.

Emergency Order Number	Effective Date	Action Taken	Comments
			fishing will close at 6 p.m. Friday, August 16 until further notice in the Port Clarence District and the Nome Subdistrict. This closure is intended to reserve the remainder of the coho salmon return for spawning. Coho salmon are mostly four year old salmon when they return to spawn and a severely weakened brood year could remain weak for several generations. Hopefully the closure will allow those remaining coho salmon to make their way into the rivers so that most will spawn and help to make up for the reduced escapements now in the rivers of northern Norton Sound. Coho escapements in the Golovin and Kwiniuk Subdistricts although below average are somewhat better than the record low escapements elsewhere. Coho passage through August 15 at the Niukluk tower is 1,221 cohos and at the Kwiniuk River tower is 1,275 cohos. However, if coho salmon escapements drop off in those subdistricts, subsistence restrictions may be necessary beginning next week.
3-S-Z-25-02	August 19, 2002	This emergency order opens the Unalakleet and Shaktoolik Subdistricts to commercial salmon fishing for a single 24 hour period beginning at 6 p.m. Monday, August 19. The period will be from 6 p.m. Monday until 6 p.m. Tuesday. Only nets with a mesh size no larger than 6 inches will be allowed.	No permit holders fished in the recent 24-hour fishing period because of poor weather. The previous 24-hour commercial period had a harvest of 66 coho and 10 chum salmon for 2 fishers in the Unalakleet Subdistrict, and 214 coho and 62 chum salmon for 6 fishers in the Shaktoolik Subdistrict. The number of permit holders fishing and the catch was well below average. The catch per unit of effort (CPUE) was below average for coho salmon in both Subdistricts. With little fishing effort and only a 24-hour fishing period instead of the usual 48-hour period the CPUE would be expected to be above average in a normal run. Historically the commercial harvest is now past the midpoint in a run with normal run timing. This year the run is weak as determined by fishing catches, test net catches and tower counts. The test net catches and the North River tower coho salmon escapement counts have been below average. With limited fishing effort expected to occur, because of low catches and low prices, allowing a 24-hour fishing period rather than the normal two 48-hour periods per week is prudent. The 24-hour fishing period will serve as make-up period for the lost fishing time because of poor weather and will provide data on the strength of the tail end of the coho run. This conservative fishing schedule should not jeopardize subsistence fishing or escapement. If catches remain poor the department may soon close the commercial fishery.
3-S-Z-26-02	August 19, 2002	This emergency order reduces subsistence fishing time in the Fish River and Niukluk River drainages to two 48-hour fishing periods per week. Fishing will be allowed from 6 p.m. Monday until 6 p.m. Wednesday and from 6 p.m. Thursday until 6 p.m. Saturday.	Coho salmon escapements on the southern Seward Peninsula indicate very weak returns. Coho escapements in the Golovin Subdistrict although below average are somewhat better than the record low escapements elsewhere. Coho passage through August 18 at the Niukluk River tower is 2,400 cohos. However, recent fishing effort has concentrated on the Niukluk River and the Fish River in the Golovin Subdistrict. The recent closure to subsistence coho fishing in the nearby Nome Subdistrict and Port Clarence District is likely resulting in more fishing effort in the Niukluk and Fish rivers. With the concentration of fishing effort in the Niukluk and Fish rivers, and a below average run of coho salmon, fishing restrictions are needed to ensure enough coho salmon will reach spawning areas. Beginning at 6 p.m. Monday, August 19, the Fish and Niukluk river drainages will be restricted to two 48-hour subsistence gillnet fishing periods per week. The subsistence gillnet periods will be from 6 p.m. Monday until 6 p.m. Wednesday and from 6 p.m. Thursday until 6 p.m. Saturday. The restricted fishing schedule is designed to provide windows of opportunity for more coho salmon to move upstream and reach their spawning destination. If the restricted fishing schedule proves ineffective in providing for necessary escapement, closures to fishing on the Niukluk River and the upper Fish River may be necessary in the future. Although the use of hook and line attached to a fishing pole is legal subsistence fishing gear in northern Norton Sound, hook and line subsistence fishers are reminded that the sport fishing regulations apply. For example, those subsistence fishers using hook and line on Niukluk River can only retain one coho salmon per day. No coho salmon can be retained in the Port Clarence District and in the Nome Subdistrict no coho or chum salmon can be retained.
3-S-Z-27-02	August 22, 2002	This emergency order closes the commercial fishing season in the Unalakleet and Shaktoolik Subdistricts.	Historically the commercial harvest is past 80% in the Unalakleet Subdistrict and 90% in the Shaktoolik Subdistrict by August 21. This season in the commercial fishery there was little participation by commercial permit holders. The catch per unit of effort (CPUE) was below average for coho salmon in both Subdistricts for most periods. For chum salmon the CPUE was above average for most periods. With little fishing effort and only 24-hour fishing periods instead of the usual 48-hour periods the CPUE would be expected to be above average in a normal run. This year the run is weak as determined by fishing catches, test net catches and tower counts. The test net catches of coho salmon have been below average and the North River tower coho salmon

Appendix G7. Emergency Orders issued during 2002.

Emergency Order Number	Effective Date	Action Taken	Comments
			escapement counts have been a record low to date. The commercial harvest had only one period where the coho CPUE was above average on August 8. The second week of August was likely the midpoint of the run in the commercial harvest area as catches have dropped off since that time. Continued poor catches and weak escapement counts indicate that the run is weak rather than late. Therefore to reserve the remaining coho for subsistence and escapement the commercial fishing season will now close. Coho salmon are mostly four year old salmon when they return to spawn and a severely weakened brood year could remain weak for several generations. Hopefully the closure will allow those remaining coho salmon to make their way into the rivers so that most will spawn and help to make up for the reduced escapements now in the rivers.
3-S-Z.28-02	August 31, 2002	This emergency order closes fresh waters in the Nome Subdistrict to subsistence salmon fishing and reopens those waters to two 48-hour subsistence fishing periods per week. This emergency order closes the Snake and Solomon Rivers to all subsistence salmon fishing and reduces the fresh water harvest area in the Nome River. This emergency area order closes the Pilgrim River to subsistence salmon fishing.	Coho salmon escapements on the southern Seward Peninsula have been weak in many areas. A two week closure to subsistence salmon fishing in both the Port Clarence District and the Nome Subdistrict has occurred since mid-August. The closure allowed more coho salmon to enter the rivers and make up for the very weak escapements. Aerial surveys of a number of Nome Subdistrict rivers and the Pilgrim River showed some rivers to have poor coho escapements and some rivers to have below average to nearly average escapements. Aerial surveys of the Solomon river the past week indicated 50 cohos, 70 cohos, and 15 cohos and that river will remain closed. The Snake River has a record low weir passage of 94 cohos through August 28 and that river will remain closed. The Pilgrim River has a record low passage of 210 cohos at the counting tower and few cohos were seen below the tower site and that river will remain closed. Other rivers had escapements that were slightly better and some that were nearly average. The Bonanza and Nome rivers showed average escapements. Historically, the majority of coho salmon should be in fresh water at this time and the existing closed areas to subsistence fishing in the Nome Subdistrict rivers should protect most spawners. The closed water area on the Nome River is being extended to protect those coho salmon that are holding lower in the river. Likely because of low water, coho salmon are holding longer in the lower reaches of the river. The fresh water areas that are opened will be on a two 48-hour fishing schedule to allow for "escapement windows" past the subsistence fishing areas. This fishing schedule should be sufficient to allow for subsistence opportunity and allow for adequate escapement.
3-S-Z-29-02	August 31, 2002	This emergency order opens the fresh waters in the Nome Subdistrict to subsistence salmon fishing to seven days a week in the areas that previous were fishing a restricted schedule of two 48-hour subsistence fishing periods per week. This emergency order continues the closure of the Snake and Solomon Rivers to all subsistence salmon fishing and the reduction of the fresh water harvest area in the Nome River. This emergency area order continues the closure of the Pilgrim River to subsistence salmon fishing.	At this time, most coho salmon should be in fresh waters in Norton Sound. In the Nome Subdistrict the existing closed areas to subsistence fishing in the rivers should protect most spawners. Coho escapement in some rivers remains poor, but other rivers have sufficient escapement. Over 1,000 cohos have passed the Nome River weir in the last two days and through September 5, the escapement at the Nome River weir is 3,150 cohos. Escapement at the Eldorado River weir is 122 cohos and at the Snake River weir is 269 cohos through September 5. Historically, the Eldorado has not had a large number of coho spawners. Aerial surveys have shown the Snake and Solomon Rivers to be well below the historical average and these rivers will remain closed. Subsistence salmon fishing will be permitted in the fresh water harvest areas of the Nome Subdistrict in all rivers, except for the Snake and Solomon Rivers, seven days a week. On the Nome River, the subsistence harvest area is from the Fish & Game regulatory markers approximately 200 yards upstream of the mouth to the regulatory markers at the VOR site. The season limit is 20 cohos for permit holders. Hook and line subsistence fishers are reminded that when they fish outside the subsistence harvest area they must follow sport fish regulations. In the Port Clarence District, the Pilgrim River will remain closed to subsistence salmon gillnet fishing. The Pilgrim River tower count of 216 cohos was a record low. As the Pilgrim River can be accessed by road from Nome it is important to protect the coho salmon from harvest and to allow them all to spawn. In the Golovin Subdistrict, the escapement past the Niukluk tower is over 7,200 cohos. Low water has prevented many fishers from attempting to harvest salmon as it is difficult to boat in the rivers. Likely the low water conditions had were more of an effect on the reduced harvest this year than the reduction in fishing time in the Niukluk and Fish River drainages. Allowing subsistence fishing seven days a week in the above fresh water areas will provide additional subsistence opportunity and should not jeopardize escapements.
3-S-	July 18, 2002	This emergency order opens commercial salmon fishing in the Kotzebue District until September 1, 2002. Commercial salmon permit holders can fish at their	mmercial salmon buyer has expressed interest in purchasing Kotzebue chum salmon thi The normally opens on July 10 and by regulation closes after August 31. The forecast was a vest of 150,000 to 200,000 chum salmon this year. Several permit holders have expressed interest in being

Appendix G7. Emergency Orders issued during 2002.

Emergency Order Number	Effective Date	Action Taken	Comments
		discretion.	catcher/sellers this season. To date only one has registered and received his code plate from Juneau to process fish tickets. He has informed the department he has a small local market and is ready to commercial fish. Because of the limited number of commercial salmon permit holders that will likely participate in fishing this year the harvest will be minimal. To provide maximum opportunity to those who will fish the department is opening the commercial salmon season 24 hours a day until further notice and the season will close on September 1, 2002. Fishers can choose when they want to fish. With an average run expected, a limited market and an expected record low number of participating fishers, achieving escapement goals are not expected to be a problem.
3-H-Z-1-02	May 22, 2002	This emergency order opens the Norton Sound Subdistricts 1, 2, and 3 to commercial gillnet herring fishing from 11:00 p.m. Wednesday, May 22, 2002 until 12:00 p.m. Thursday, May 23, 2002. Each vessel may operate 50 fathoms of gillnet. There is the possibility of an extension. An announcement regarding if an extension is allowed will be made at 11:00 a.m. Thursday, May 23, 2002 on VHF 7a and SSB 4125.	Herring were first observed in large quantities on May 20 along with significant herring spawn. On May 20, the threshold biomass of 7,000 tons was exceeded when 8,969 tons of herring were observed during an aerial survey. Spawning is already well under way and buyers are present and ready to take herring from fishers. Samples taken by commercial fishermen in Norton Sound Subdistrict 3 on May 22 ranged between 8 and 12.6% mature roe. The department's test fish samples indicate the herring return is similar to the 2002 preseason projection which characterizes the Norton Sound stock as stable and healthy. The department projections for the 2002 spawning biomass, for the Norton Sound sac roe fishery is 22,463 tons. A 20% exploitation rate would result in a guideline harvest level for the Norton Sound District of 4,173 tons with 3,756 tons allocated to the gillnet fishery. Very little effort is expected in Norton Sound for the 2002 season. There is a limited market for sac roe herring this season, and the harvest is anticipated to fall far short of the harvest guideline. The department wants to take advantage of the good quality fish as they become available. This initial gillnet fishing period with reduced gear limits is intended to further test the commercial quality of the herring available. An extension of fishing time may be possible if product conditions and abundance warrant. Permit holders are cautioned to be sure they can sell their fish and they should check their roe quality frequently while loading their fishing boat. If the buyer will not accept the catch it will be the responsibility of the permit holder to find a use for the herring. Do not dump your herring. The permit holder can be cited if the fish are wasted.
3-H-Z-2-02	May 23, 2002	This emergency order extends the commercial gillnet herring fishing period established by 3-H-Z-1-02 by 12 additional hours in Norton Sound Subdistricts 1, 2, and 3. This commercial herring gillnet fishing period will now close at 12:00 a.m. Friday, May 24, 2002. Each vessel may operate 50 fathoms of gillnet.	Herring were first observed in large quantities on May 20 with the first herring spawn observed on May 20. Preliminary harvest from today's opening was 100 tons in Subdistrict 3 at 10% roe recovery and 40 tons of herring in Subdistrict 1 with an average roe percent of 8.5. There were 4 fishers in subdistrict 1 and 5 fishers in subdistrict 3. Because of low participation by fishers and limited buying capacity, the department wants to take advantage of the good quality fish while they are still available. By extending the opening for 12 hours, buyers can control the test fishing and fishers can immediately harvest good quality herring. Permit holders are cautioned to be sure they can sell their fish and they should check their roe quality frequently while loading their fishing boat. If the buyer will not accept the catch it will be the responsibility of the permit holder to find a use for the herring. Do not dump your herring. The permit holder can be cited if the fish are wasted.
3-H-Z-3-02	May 24, 2002	This emergency order opens the commercial herring gillnet fishery in Norton Sound Subdistricts 1, 2, and 3 from 12:00 a.m. Friday, May 24, 2002 until 12:00 a.m. Saturday, May 25, 2002. Each vessel may operate 50 fathoms of gillnet.	Herring and spawn have been observed in large quantities since May 20 with the first herring spawn observed on May 20 in Subdistrict 1. Preliminary harvest from today's opening was 100 tons in Subdistrict 3 at 10% roe recovery and 40 tons of herring in Subdistrict 1 with an average roe percent of 8.5. There were 4 fishers in subdistrict 1 and 5 fishers in subdistrict 3. Because of low participation by fishers and limited buying capacity, the department wants to take advantage of the good quality fish while they are still available. By opening for 24 hours, buyers can control the test fishing and fishers can immediately harvest good quality herring. Permit holders are cautioned to be sure they can sell their fish and they should check their roe quality frequently while loading their fishing boat. If the buyer will not accept the catch it will be the responsibility of the permit holder to find a use for the herring. Do not dump your herring. The permit holder can be cited if the fish are wasted.
3-H-Z-4-02	May 25, 2002	This emergency order opens the commercial herring gillnet fishery in Norton Sound Subdistricts 1, 2, and 3 from 12:00 a.m. Saturday, May 25, 2002 until 12:00 a.m. Sunday, May 26, 2002. Each vessel may operate 50 fathoms of gillnet.	Herring and spawn have been observed in large quantities since May 20 with the first herring spawn observed on May 20 in Subdistrict 1. The preliminary total harvest is 443 tons of herring with an average roe percent of 10.1%. Because of low participation by fishers and limited buying capacity, the department wants to take advantage of the good quality fish while they are still available. By opening for 24 hours, buyers can control the test fishing and fishers can immediately harvest good quality herring. Permit holders are cautioned to be sure they

Appendix G7. Emergency Orders issued during 2002.

Emergency Order Number	Effective Date	Action Taken	Comments
			can sell their fish and they should check their roe quality frequently while loading their fishing boat. If the buyer will not accept the catch it will be the responsibility of the permit holder to find a use for the herring. Do not dump your herring. The permit holder can be cited if the fish are wasted.
3-H-Z-5-02	May 26, 2002	This emergency order opens the commercial herring gillnet fishery in Norton Sound Subdistricts 1, 2, and 3 from 12:00 a.m. Sunday, May 26, 2002 until 12:00 a.m. Monday, May 27, 2002. Each vessel may operate 50 fathoms of gillnet.	Herring and spawn have been observed in large quantities since May 20 with the first herring spawn observed on May 20 in Subdistrict 1. The preliminary total harvest is 713 tons of herring with an average roe percent of 10.3% through 5:00 p.m. May 25. Because of low participation by fishers and limited buying capacity, the department wants to take advantage of the good quality fish while they are still available. By opening for 24 hours, buyers can control the test fishing and fishers can immediately harvest good quality herring. Permit holders are cautioned to be sure they can sell their fish and they should check their roe quality frequently while loading their fishing boat. If the buyer will not accept the catch it will be the responsibility of the permit holder to find a use for the herring. Do not dump your herring. The permit holder can be cited if the fish are wasted.
3-H-Z-6-02	May 26, 2002	This emergency order supercedes Emergency Order 3-H-Z-5-02 for the commercial herring gillnet fishery in Norton Sound Subdistricts 1, 2, and 3 effective at 12:00 p.m. Sunday, May 26, 2002. Commercial fishing will be allowed from 12:00 p.m. Sunday, May 26, 2002 until 12:00 a.m. Monday, May 27, 2002, and allow for the use of two nets and up to 100 fathoms of gillnet per permit holder.	Herring and spawn have been observed in large quantities since May 20 with the first herring spawn observed on May 20 in Subdistrict 1. The preliminary total harvest is 810 tons of herring with an average roe percent of 10.3% through 9:00 a.m. May 26. Catches began to drop off yesterday afternoon and the catch after midnight through 9 a.m. today has been 46 tons at 10.5% for 20 deliveries. There are approximately 20 boats that have been participating in the commercial fishery, and with catches beginning to decrease, the buyers have requested that fishers be allowed to use two nets. The use of two nets will allow the fishers to maximize their harvest. The buyers have informed the department they have approximately 1,800 tons of capacity remaining for the season. They can process approximately 260 tons per day and will not allow the harvest to back up farther than three days processing time. As of noon today they are backlogged only one day of processing time. The department wants to take advantage of the buyer's request to allow more harvest while herring are still present. By allowing two nets to be fished the final 12 hours of today's fishery, the fishers, buyers and the department can determine if the harvest rates and roe quality and acceptable to continue with two net openings. With the record low participation by herring permit holders this season the department believes that fishing two nets should not create any major difficulties with congestion in the fishery. Permit holders are cautioned to be sure they can sell their fish and they should check their roe quality frequently while loading their fishing boat. If the buyer will not accept the catch it will be the responsibility of the permit holder to find a use for the herring. Do not dump your herring. The permit holder can be cited if the fish are wasted.
3-H-Z-7-02	May 27, 2002	This emergency order opens the commercial herring gillnet fishery in Norton Sound Subdistricts 1, 2, and 3 from 12:00 a.m. Monday, May 27, 2002 until 12:00 a.m. Tuesday, May 28, 2002. Each vessel may operate 100 fathoms of gillnet.	Herring and spawn have been observed in large quantities since May 20 with the first herring spawn observed on May 20 in Subdistrict 1. The preliminary total harvest is 835 tons of herring with an average roe percent of 10.3% through 6:00 p.m. May 26. Catches began to drop off yesterday afternoon and most fishers have taken a break to rest. Although there have not been tenders in the St. Michael Subdistrict for a couple of days, there has been interest expressed by both fishers and buyers in again fishing there. Some boats and tenders are now moving to the St. Michael Subdistrict. Aerial surveyors observed approximately 5,000 tons of herring in the St. Michael Subdistrict on May 26. There are approximately 20 boats that have been participating in the commercial fishery, and with catches beginning to decrease, the buyers have requested that fishers be allowed to use two nets. The use of two nets will allow the fishers to maximize their harvest. The buyers have informed the department they have approximately 1,800 tons of capacity remaining for the season. They can process approximately 260 tons per day and will not allow the harvest to back up farther than three days processing time. As of 6:00 p.m. May 26 they are backlogged only one day of processing time. The department wants to take advantage of the buyer's request to allow more harvest while herring are still present. With the record low participation by herring permit holders this season the department believes that fishing two nets should not create any major difficulties with congestion in the fishery. Permit holders are cautioned to be sure they can sell their fish and they should check their roe quality frequently while loading their fishing boat. If the buyer will not [illegible] the catch it will be the responsibility of the permit holder to find a use for the herring. [illegible] dump your [illegible]. The permit holder can be cited if the fish are wasted.
3-H-Z-8-02	May 28, 2002	This emergency order opens the commercial herring	Herring and spawn have been observed in large quantities since May 20 with the first herring spawn observed on

Appendix G7. Emergency Orders issued during 2002.

Emergency Order Number	Effective Date	Action Taken	Comments
		gillnet fishery in Norton Sound Subdistricts 1, 2, and 3 from 12:00 a.m. Tuesday, May 28, 2002 until 12:00 a.m. Wednesday, May 29, 2002. Each vessel may operate 100 fathoms of gillnet.	May 20 in Subdistrict 1. The preliminary total harvest is 835 tons of herring with an average roe percent of 10.3% through 6:00 p.m. May 26. Catches began to drop off May 26 and most fishers have taken a break to rest. The majority of the boats and tenders are now moving to the St. Michael Subdistrict. Aerial surveyors observed approximately 5,000 tons of herring in the St. Michael Subdistrict on May 26. There are approximately 20 boats that have been participating in the commercial fishery, and with catches beginning to decrease, the buyers have requested that fishers be allowed to use two nets. The use of two nets will allow the fishers to maximize their harvest. The department wants to take advantage of the buyer's request to allow more harvest while herring are still present. With the record low participation by herring permit holders this season the department believes that fishing two nets should not create any major difficulties with congestion in the fishery. Permit holders are cautioned to be sure they can sell their fish and they should check their roe quality frequently while loading their fishing boat. If the buyer will not accept the catch it will be the responsibility of the permit holder to find a use for the herring. Do not dump your herring. The permit holder can be cited if the fish are wasted.
3-H-Z-9-02	May 29, 2002	This emergency order opens the commercial herring gillnet fishery in Norton Sound Subdistricts 1, 2, and 3 from 12:00 a.m. Wednesday, May 29, 2002 until 12:00 a.m. Thursday, May 30, 2002. Each vessel may operate 100 fathoms of gillnet.	Herring and spawn have been observed in large quantities since May 20 with the first herring spawn observed on May 20 in Subdistrict 1. The preliminary total harvest is 889 tons of herring with an average roe percent of 10.3% through 6:00 p.m. May 28. Catches began to drop off May 26. The majority of the boats and tenders are now located in the St. Michael Subdistrict. Aerial surveyors observed approximately 6,000 tons of herring between Unalakleet and Tolstoi on May 28. There are approximately 20 boats that have been participating in the commercial fishery, and with catches decreasing, the buyers have requested that fishers be allowed to use two nets. The use of two nets will allow the fishers to maximize their harvest. The department wants to take advantage of the buyer's request to allow more harvest while herring are still present. With the record low participation by herring permit holders this season the department believes that fishing two nets should not create any major difficulties with congestion in the fishery. Permit holders are cautioned to be sure they can sell their fish and they should check their roe quality frequently while loading their fishing boat. If the buyer will not accept the catch it will be the responsibility of the permit holder to find a use for the herring. Do not dump your herring. The permit holder can be cited if the fish are wasted.
3-H-Z-10-02	May 30, 2002	This emergency order opens the commercial herring gillnet fishery in Norton Sound Subdistricts 1, 2, and 3 from 12:00 a.m. Thursday, May 30, 2002 until 12:00 a.m. Friday, May 31, 2002. Each vessel may operate 100 fathoms of gillnet.	Herring and spawn have been observed in large quantities since May 20 with the first herring spawn observed on May 20 in Subdistrict 1. The preliminary total harvest is 893 tons of herring with an average roe percent of 10.3% through 6:00 p.m. May 29. Catches began to drop off May 26. The majority of the boats and tenders are now located in the St. Michael Subdistrict. Aerial surveyors observed approximately 2,200 tons of herring from Cape Denbigh to St. Michael Bay on May 29. Catches on May 29 decreased to 3 tons at 10.0% with most commercial fishers now quitting fishing. At present less than 10 fishers are still participating in the commercial fishery. To date fishers have been able to avoid fishing on spawnouts and roe percentages have stayed near 10%. Test fish catches have shown smaller herring size for several days and reports from commercial fishers indicate that small herring have been swimming through the larger commercial mesh gillnets. The department has concerns that smaller sized herring will suffer some mortality passing through the nets, but because of the record low participation in the commercial fishery this year, the mortality is much less than would have occurred to date with an average size fishing fleet. If catches continue to show small herring the department will consider closing the fishery. At this time an additional 24-hour period will allow fishers time to test fish for saleable herring and allow further assessment of the fishery. Permit holders are cautioned to be sure they can sell their fish and they should check their roe quality frequently while loading their fishing boat. If the buyer will not accept the catch it will be the responsibility of the permit holder to find a use for the herring. Do not dump your herring. The permit holder can be cited if the fish are wasted.
3-H-Z-11-02	May 31, 2002	This emergency order opens the commercial herring gillnet fishery in Norton Sound Subdistricts 1, 2, and 3 from 12:00 a.m. Friday, May 31, 2002 until 12:00 a.m. Saturday, June 1, 2002. Each vessel may operate 100 fathoms of gillnet.	Herring and spawn have been observed in large quantities since May 20 with the first herring spawn observed on May 20 in Subdistrict 1. The preliminary total harvest is 905 tons of herring with an average roe percent of 10.3% through 6:00 p.m. May 30. Catches began to drop off May 26. The majority of the boats and tenders are now located in the St. Michael Subdistrict. Aerial surveyors observed approximately 2,200 tons of herring from Cape Denbigh to St. Michael Bay on May 29. Catches on May 29 decreased to 3 tons at 10.0% with most

Appendix G7. Emergency Orders issued during 2002.

Emergency Order Number	Effective Date	Action Taken	Comments
			commercial fishers now quitting fishing. At present less than 10 fishers are still participating in the commercial fishery. To date fishers have been able to avoid fishing on spawnouts and roe percentagex have stayed near 10%. Test fish catches have shown smaller herring size for several days and reports from commercial fishers indicate that small herring have been swimming through the larger commercial mesh gillnets. The department has concerns that smaller sized herring will suffer some mortality passing through the nets, but because of the record low participation in the commercial fishery this year, the mortality is much less than would have occurred to date with an average size fishing fleet. If catches continue to show small herring the department will consider closing the fishery. At this time an additional 24-hour period will allow fishers time to test fish for saleable herring and allow further assessment of the fishery. Permit holders are cautioned to be sure they can sell their fish and they should check their roe quality frequently while loading their fishing boat. If the buyer will not accept the catch it will be the responsibility of the permit holder to find a use for the herring. Do not dump your herring. The permit holder can be cited if the fish are wasted.
3-H-Z-12-02	June 1, 2002	This emergency order opens the commercial herring gillnet fishery in Norton Sound Subdistricts 1, 2, and 3 from 12:00 a.m. Saturday, June 1, 2002 until 12:00 a.m. Sunday, June 2, 2002. Each vessel may operate 100 fathoms of gillnet.	Herring and spawn have been observed in large quantities since May 20 with the first herring spawn observed on May 20 in Subdistrict 1. The preliminary total harvest is 947 tons of herring with an average roe percent of 10.3% through 6:00 p.m. May 31. Catches began to drop off May 26. The majority of the boats and tenders are now located in the St. Michael Subdistrict. Aerial surveyors observed approximately 870 tons of herring from Cape Denbigh to St. Michael Bay on May 31. At present less than 10 fishers are still participating in the commercial fishery. To date fishers have been able to avoid fishing on spawnouts and roe percentages have stayed near 10%. Test fish catches have shown smaller herring size for several days and reports from commercial fishers indicate that small herring have been swimming through the larger commercial mesh gillnets. The department has concerns that smaller sized herring will suffer some mortality passing through the nets, but because of the record low participation in the commercial fishery this year, the mortality is much less than would have occurred to date with an average size fishing fleet. If catches continue to show small herring the department will consider closing the fishery. At this time an additional 24-hour period will allow fishers time to test fish for saleable herring and allow further assessment of the fishery. Permit holders are cautioned to be sure they can sell their fish and they should check their roe quality frequently while loading their fishing boat. If the buyer will not accept the catch it will be the responsibility of the permit holder to find a use for the herring. Do not dump your herring. The permit holder can be cited if the fish are wasted.
3-H-Z-13-02	June 2, 2002	This emergency order opens the commercial herring gillnet fishery in Norton Sound Subdistricts 1, 2, and 3 from 12:00 a.m. Sunday, June 2, 2002 until 12:00 a.m. Monday, June 3, 2002. Each vessel may operate 100 fathoms of gillnet.	Herring and spawn have been observed in large quantities since May 20 with the first herring spawn observed on May 20 in Subdistrict 1. The preliminary total harvest is 961 tons of herring with an average roe percent of 10.3% through 6:00 p.m. June 1. Catches began to drop off May 26. The majority of the boats and tenders are now located in the St. Michael Subdistrict. Aerial surveyors observed approximately 870 tons of herring from Cape Denbigh to St. Michael Bay on May 31. A present less than 10 fishers are still participating in the commercial fishery. To date fishers have been able to avoid fishing on spawnouts and roe percentages have stayed near 10%. Test fish catches have shown smaller herring size for several days and reports from commercial fishers indicate that small herring have been swimming through the larger commercial mesh gillnets. The department has concerns that smaller sized herring will suffer some mortality passing through the nets, but because of the record low participation in the commercial fishery this year, the mortality is much less than would have occurred to date with an average size fishing fleet. If catches continue to show small herring the department will consider closing the fishery. At this time an additional 24-hour period will allow fishers time to test fish for saleable herring and allow further assessment of the fishery. Permit holders are cautioned to be sure they can sell their fish and they should check their roe quality frequently while loading their fishing boat. If the buyer will not accept the catch it will be the responsibility of the permit holder to find a use for the herring. Do not dump your herring. The permit holder can be cited if the fish are wasted.
3-H-[illegible]-02	June 3, 2002	This emergency order opens the commercial herring gillnet fishery in Norton Sound Subdistricts 1, 2, and 3 from 12:00 a.m. Monday, June 3, 2002 until 12:00 a.m. Tuesday, June 4, 2002. Each vessel may operate 100	[illegible]ring and spawn have been observed in large quantities since May 20 with the first herring spawn observed on 20 in Subdistrict 1. The preliminary total harvest is 973 tons of herring with an ave[illegible] percent of [illegible] through 6:00 p.m. June 2. Catches began to drop off May 26. The majority of the b[illegible] tenders are now located in the St. Michael Subdistrict. Aerial surveyors observed approximately 870 tons of herring from

Appendix G7. Emergency Orders issued during 2002.

Emergency Order Number	Effective Date	Action Taken	Comments
		fathoms of gillnet.	Cape Denbigh to St. Michael Bay on May 31. A present less than 10 fishers are still participating in the commercial fishery. To date fishers have been able to avoid fishing on spawnouts and roe percentages have stayed near 10%. Test fish catches have shown smaller herring size for several days and reports from commercial fishers indicate that small herring have been swimming through the larger commercial mesh gillnets. The department has concerns that smaller sized herring will suffer some mortality passing through the nets, but because of the record low participation in the commercial fishery this year, the mortality is much less than would have occurred to date with an average size fishing fleet. If catches continue to show small herring the department will consider closing the fishery. At this time an additional 24-hour period will allow fishers time to test fish for saleable herring and allow further assessment of the fishery. Permit holders are cautioned to be sure they can sell their fish and they should check their roe quality frequently while loading their fishing boat. If the buyer will not accept the catch it will be the responsibility of the permit holder to find a use for the herring. Do not dump your herring. The permit holder can be cited if the fish are wasted.
3-H-Z-15-02	June 4, 2002	This emergency order opens commercial gillnet herring fishing in Subdistrict 7 of Norton Sound from 12:00 noon Tuesday, June 4 until 12:00 noon Wednesday, June 12. Each vessel may operate 50 fathoms of gillnet, only.	An aerial survey flown on June 3 observed herring spread throughout much of the Norton Sound District. Small schools of fish have been observed as far north as Rocky Point. There is a movement of herring along the northern shore of Norton Sound. Herring are abundant in Nome at this time. Nome area fishers have requested an opportunity to harvest herring for bait near Nome. The commercial harvest is not anticipated to reach the harvest guideline and does not present a conservation concern. This fishing period is being allowed to harvest herring while they are at their peak abundance for local fishers. By regulation fishers that hold 2002 commercial crab or halibut permits may also harvest up to 1 ton of bait under 5AAC 27.971. Crab and halibut permit holders may take but may not sell herring for use as bait. Participants in the Subdistrict 7 fishery are required to register with the Department staff at either the Nome or Unalakleet office. Periodic harvest reports will be required.
3-C-Z-1-02	June 15, 2002	This emergency order opens the commercial CDQ crab fishery in Norton Sound from 12:00 noon Saturday, June 15 until 12:00 noon Friday, June 28.	The 2002 Norton Sound sac roe herring fishery will close by Emergency Order on 12 noon, June 12, 2002. By regulation, the Norton Sound CDQ crab fishery may begin at 12:00 noon, June 15, or no less than 72 hours after the commercial gillnet or beach seine herring fishery is closed, whichever is later. The guideline harvest level for the 2002 Norton Sound crab fishery is 248,000 pounds. By regulation, the CDQ fishery is allocated 7.5% of the summer season harvest. Therefore, the CDQ harvest quota is set at 18,600 pounds. Only fishers designated by the Norton Sound and Lower Yukon CDQ groups are allowed to participate in this portion of the king crab fishery. Fishers must have a CDQ fishing permit from Commercial Fisheries Entry Commission and register with Nome or Unalakleet ADF&G prior to fishing. Fishers will also be given pot tags at the time of registration. It is important for fishers to understand that they are operating under the authority of the CDQ permit holder. It is the individual CDQ group's decision on how the CDQ crab quota will be harvested.
3-C-Z-2-02	August 6, 2002	This emergency order closes the commercial open access crab fishery in Norton Sound at 12:00 noon Tuesday, August 6 and reopens the Norton Sound CDQ crab fishery at 12:00 noon Friday, August 9 to harvest the remainder of the CDQ allocation.	The guideline harvest level for the 2002 Norton Sound crab fishery is 248,000 pounds. By regulation, the CDQ fishery is allocated 7.5% of the summer season harvest. Therefore, the CDQ harvest quota was set at 18,600 pounds preseason. The open access crab portion of the fishery has an allowable harvest of 229,400 pounds of crab. As of August 4, the open access fishery harvest was approximately 213,700 pounds of crab. There are now 25 vessels participating in the fishery and the harvest rate has increased in the last week. All pot gear must have doors open and bait containers removed by 12:00 noon, Tuesday August 6. All fishers are advised that all pot gear must be out of the water by 12:00 noon Wednesday, August 7. CDQ fishers had 8,350 pounds of crab left to harvest of their allocation. The CDQ allocation will be adjusted to 7.5% of the open access harvest after all buyers report in their final numbers. Only fishers designated by the Norton Sound and Lower Yukon CDQ groups are allowed to participate in the CDQ portion of the king crab fishery. Fishers must have a CDQ fishing permit from Commercial Fisheries Entry Commission and must have register with Nome or Unalakleet ADF&G prior to fishing. It is important for fishers to understand that they are operating under the authority of the CDQ permit holder. It is the individual CDQ group's decision on how the CDQ crab quota will be harvested.