

ANNUAL MANAGEMENT REPORT
2000
NORTON SOUND - PORT CLARENCE - KOTZEBUE

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Regional Information Report¹ No. 3A02-02

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

January 2002

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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 in providing 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 Field Office Assistant, who, over the past year, have 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 would like to thank the Norton Sound Economic Development Corporation for providing funding for interns, and Kawerak, for their assistance in cooperative projects. We also thank the Regional biologist staff for technical assistance and acknowledge the data collection of many technicians and volunteers this past season.

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PRESENTATION

This report summarizes the 2000 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 will be presented in separate reports.

Data presented in this report supersedes information found in previous management reports. An attempt has been made to correct errors presented in earlier reports. Previously unreported data has been 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

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

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

SECTION 1 - SALMON

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 comprise over 65,000 square miles, with a 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 being the most abundant. Chum, pink, and chinook (king) salmon (*O. tshawytscha*) have been 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, while 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 that 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. As a result, commercial salmon fishing activity has grown significantly since statehood, enabling some local residents to obtain cash income.

The majority 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 commercial salmon fishing is done in coastal marine waters.

Salmon effort and catch per unit effort data (CPUE) presented throughout this section have been derived as follows. 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.

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 (1978-1982) the average subsistence catch was 73,000 salmon including all species (Appendix Table 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 approach 75,000 annually (Appendix Table C6).

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 2000, 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 six of the 15 Kotzebue District communities. In Kotzebue, subsistence salmon harvests were determined through a postcard survey and in the Nome area, harvests were determined through fishing permits and catch calendars. In the 16 surveyed communities, surveyors attempted to contact 100 percent of the households, with an actual contact rate of 77 percent in 2000. The harvest data were expanded to account for those households not contacted.

The goals of the postseason household survey were to:

- 1) collect harvest data that would result in a total harvest estimate for subsistence salmon by species and community,
- 2) compile information on gear types, participation rates, sharing, use of salmon for dog food, and household size, and
- 3) update household lists and identify subsistence fishing households. Researchers interviewed households with the use of a two-page survey instrument (Appendices G4-G6).

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 2000 consisted of an Area Management Biologist, two Assistant Area Biologists, and an Administrative Clerk 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. Additional assistance was provided by biologists from the regional staff. In 2000, interns funded by Norton Sound Economic Development Corporation (NSEDC) were utilized as fisheries technicians in some projects. Four cooperative projects staffed by Kawerak Inc. in Norton Sound supplement 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 and Kawerak Inc. projects are presented in Appendix G2.

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

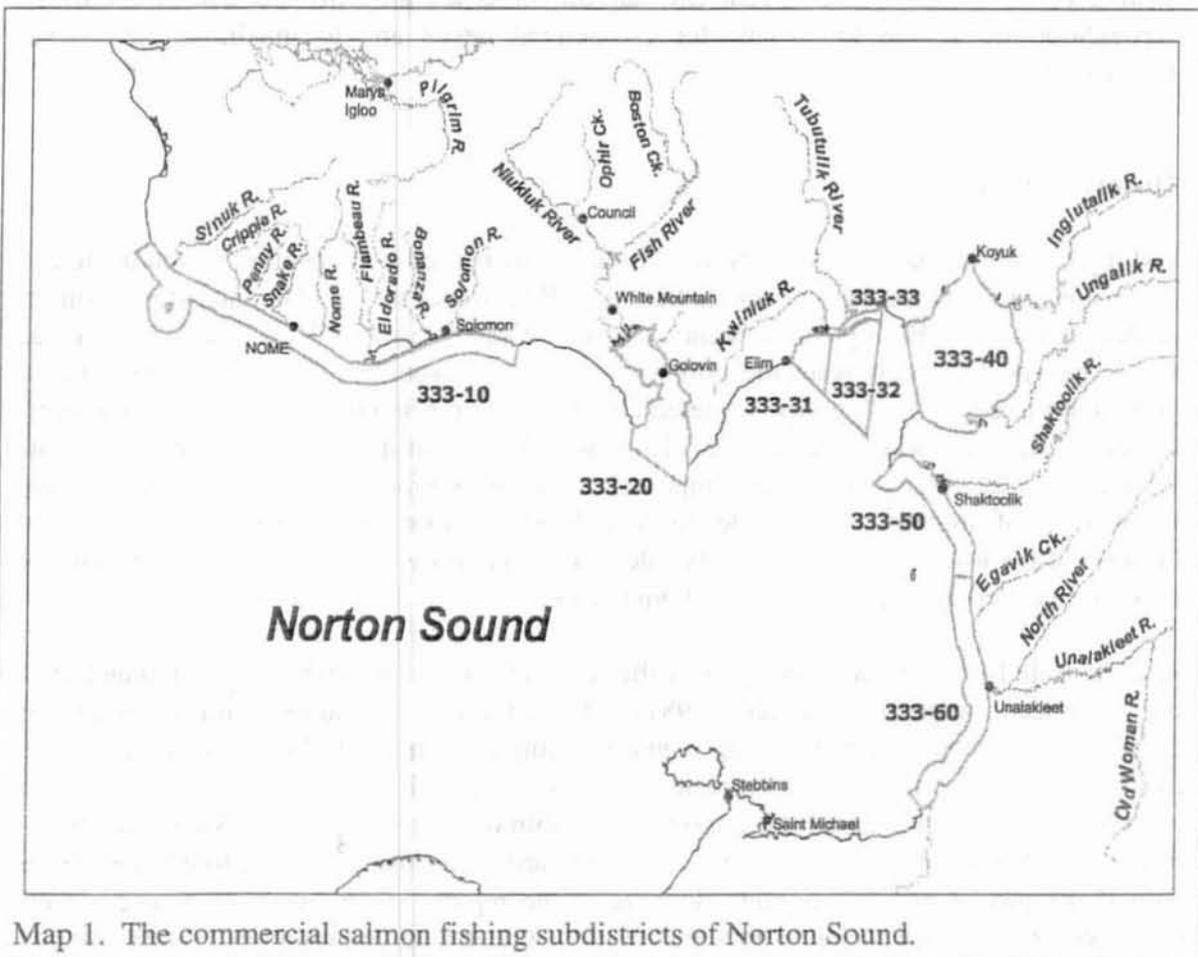
The basic regulation that governs the commercial salmon harvest in all districts is the scheduled weekly fishing period. Commercial fishing regulations provide for a total of two to four days of fishing per week during the open season depending on area and season. The Department attempts to distribute 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, depending upon fishing conditions and the strength of the returns 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. In addition, fishery news articles are published in the Nome Nugget, and the Arctic Sounder.

NORTON SOUND DISTRICT

District Boundaries

The 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. The 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. Emphasis switches to chum salmon around June 25 and the coho salmon fishery begins the fourth week of July. The season closes September 7. Pink salmon may be very abundant on even numbered year returns and a pink directed fishery may replace or may be scheduled to alternate periods with the historical chum directed fishery.

Salmon management has changed significantly during recent years due to limited market conditions and marginal returns of many salmon stocks within the northern portion of the district. The Eastern Subdistricts, Norton Bay, Shaktoolik, and Unalakleet all have fairly healthy salmon stocks. Commercial fishing in these subdistricts is managed using commercial fishing statistics and the Unalakleet River test fishing escapement index. Both the Golovin and Moses Point Subdistricts have recently suffered from poor chum salmon returns. In these two subdistricts, management first insures an adequate escapement, then a subsistence harvest within historical levels and finally an attempt is made to provide for a commercial and sport harvest. 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

Fishing has been a part of life for Norton Sound residents for many centuries as indicated by archeological evidence dating back 2,000 years (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 on a seasonal basis 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 the 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 1800's 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 1890's gold was discovered on the Seward Peninsula and boom-towns sprang up with thousands of new immigrants flocking to the region. Commerce developed which drew people to central locations that evolved into year-round communities. Other reasons for communities to become established stemmed from the operation of missions.

The impact of mining was significant on fish populations. 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 was 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 with 10,000 people at one time, did not exist before gold was discovered.

It was in the late 19th century when 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 done with 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 great demand for dog food, which consisted of primarily chum and pink salmon (Thomas 1982).

Local residents would spend most of their summers catching and drying large amounts of salmon, some of which they kept for themselves and the rest would be bartered or sold to mining camps, roadhouses, and trading posts or stores. For example, the Haycock mining camp on the Koyuk River would buy about two tons of dry fish each year. There were roadhouses at Golovin, Walla Walla, Moses Point, Isaac's Point, Ungalik, Robertvale, foothills (south of Shaktoolik), Egavik, and many 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 felt that more fish were retained for their own use as compared to the amount sold which may have averaged five to ten bundles per household (Thomas 1982).

After the gold rush the number of people gradually decreased over the next twenty years as the gold deposits were worked out. The number of dog teams diminished by the mid 1930s with the introduction of the mail plane and mechanical tractors. The last mail team contract ended in 1962 at Savoonga. Local stores continued to trade in dry fish at Shaktoolik, Saint Michael, Unalakleet, and Golovin. An example of quantity was the Shaktoolik store that had a cache 8x20x40 feet which would be 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 1960's, 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 trading 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 that were

flown in dressed condition to Anchorage for further processing. A single U.S. freezer ship also 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 Golovin Bay Subdistricts. The peak in salmon canning operations occurred during 1963.

Since then, markets have been sporadic and some subdistricts have often been unable to attract buyers for entire seasons. A joint venture between KEG (Koyuk-Elim-Golovin) Fisheries and NPL Alaska, Inc., operated from 1984 until mid-season in 1988. A permit issued by the Governor allowed two Japanese freezer ships to buy directly from domestic fishers and was 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 occurs.

The commercial salmon fishing season usually opens by emergency order between June 8 and July 1, depending on run timing within each subdistrict. The season closes by regulation on August 31 in Subdistricts 1, 2, and 3, and on September 7 in Subdistricts 4, 5, and 6, but processors often terminate their operations prior to the regulatory closure dates. Two 48-hour fishing periods normally occur each week unless changed by emergency order with the exception of the Nome and Moses Point Subdistricts, where two 24-hour fishing periods are scheduled each week.

Commercial fishing gear is restricted to set gillnets, with a maximum aggregate length of 100 fathoms allowed for each fisher. There are no mesh size or depth restrictions during the normally scheduled periods. However, mesh size is often restricted in an attempt to harvest a specific species of salmon. The majority of the gillnets fished are approximately 5 3/4 inch stretched measure. In the 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, 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 due 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 of time.

Commercial Fishery Management

The Norton Sound District is managed on the basis of comparative commercial catch data, escapements and weather conditions. A single factor or combination of factors may result in issuance of emergency orders affecting seasons, fishing periods, allowable mesh size, and areas.

Aerial surveys are used to monitor escapements in the majority of the 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 are a much more consistent and accurate method of obtaining escapement information and have been utilized on several river systems in Norton Sound. Seven counting towers were operated in 2000.

The commercial fishing season begins with chinook salmon in mid June. Emphasis switches to chum salmon around June 25, then gradually shifts to coho during the fourth week in July. Pink salmon are abundant during even numbered years, but there is often no market for this species. The southern Norton Sound Subdistricts 5 and 6 (Shaktoolik and Unalakleet) have maintained commercial fisheries. They target chinook, chum, and coho salmon, with chinook and coho salmon catches remaining fairly stable while chum salmon catches have been declining since the early 1980's. Management has consisted of a series of emergency orders that 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 has dropped dramatically since the mid 1980s. Poor returns have resulted in restrictive management actions during recent years when the seasons have been closed by emergency order to allow for escapement and subsistence needs.

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

Subsistence Fishery Overview

Due to budgetary restrictions, household subsistence harvest surveys were not conducted district wide in Norton Sound from 1985 to 1993. Since 1994, the department has conducted an annual subsistence salmon harvest assessment effort in northwest Alaska which provided 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 11 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. There is a growing trend to move subsistence nets from the river mouth out to the ocean in order to avoid large debris loads from spring runoff. It is presently unclear what changes this fishing technique will have on chinook salmon escapement.

Low salmon stock levels in the Nome Subdistrict combined with a large concentration of users has required issuing subsistence harvest permits for the area since 1974. These are issued by regulation to each household and designated fishing location. Each location 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 must 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 that the fishery intercepts 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 in addition to an important subsistence fishery that targets local stocks, a commercial harvest guideline of 5,000-15,000 chum salmon was adopted as a regulation.

Due to poor chum salmon escapement during the 1982 and 1983 seasons, the Board of Fisheries, in response to an advisory committee petition, directed the Department to manage the commercial fishery so that chum salmon escapement could be optimized. During the 1984 fall Board of Fisheries meetings, these directives that had been 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 commercial fishing 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 which curtailed commercial fishing activities, and later, sport, personal use, and subsistence were also 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 during the 1987 Alaska Board of Fisheries meetings.

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 during 1984. Additional new regulations affecting personal use and subsistence fishers which were adopted in 1987 included:

- 1) In the Nome River, no person may operate more than 50 feet of gillnet in the aggregate.
- 2) The Nome River was added to the regulation 5AAC 01.170 (e) which states that 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 the authority to allow the subsistence harvest of chum or pink salmon by beach seine if escapement needs were likely to be 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 as a means to harvest abundant species, while allowing the live release of other species experiencing depressed runs.

The Nome Subdistrict was designated as a Tier II subsistence salmon management area during a special meeting by the Alaska Board of Fisheries held in Nome during March of

1999. Through a series of Board of Fisheries directed meetings, the Board concluded that 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 based on fishing history, dependence, and the projected harvestable surplus. The intent was to allow up to 30 permit holder's first 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 Alaskan residents of who obtain a registration permit and restrict individual harvests to prescribed bag limits. In addition, the Board established "Closed Waters" areas that would protect chum salmon on the spawning grounds where no subsistence salmon fishing would be allowed at any time.

2000 Norton Sound Salmon Fishery

Commercial Fishery Overview

The 2000 Norton Sound commercial salmon season can be described as poor when compared to recent years. The commercial fishing season began on June 22, which was near the average start date. Although the regulatory closure is on September 4, the lack of a buyer resulted in the season ending in late August. Commercial fishing time and areas were set throughout the season by emergency order. The 2000 fishery value to the fishers was \$149,907, one of the lowest values in the last 30 years, second only to 1999.

Appendix Table A13 lists the Norton Sound salmon historical and current year commercial harvests relative to the recent 5-year (1995-1999) and the recent 10-year (1990-1999) averages. The total salmon harvest was very poor for all salmon species in 2000. The 2000 chinook salmon harvest of 752 fish was the lowest on record and approximately 90% below the recent 5- and 10-year average catches. The coho salmon harvest of 44,409 fish was 16% above the recent 5-year average, but was 21% below the recent 10-year average catches. Commercial markets for pink salmon are sporadic in Norton Sound, but have recently generated interest for the strong even numbered year returns. The 2000 pink salmon return was weak compared to recent even numbered year returns and was 18% below recent 5- and 10-year average catches. The chum salmon commercial harvest of 6,150 was the lowest on record at 72% below the 5-year average and 85% below the 10-year average. Overall for Norton Sound the harvest of all species totaling 217,873 fish was 27% below the 5-year average and 35% below the 10-year average.

Only one primary salmon buyer operated in Norton Sound during the 2000 season. The Unalakleet fish plant operated by Norton Sound Seafood Products was the base of commercial fisheries operations. Salmon were both delivered to the Unalakleet dock and tendered from the neighboring Shaktoolik Subdistrict. At Unalakleet, salmon were headed and gutted, iced, and then most were transported fresh to markets in Anchorage via airfreight. Some salmon were held in freezers for later sales. In addition, pink salmon were purchased through the same company, but delivered to a processing vessel operating

in Norton Sound. The same tenders were used to collect and transport pink salmon catches to the processing vessel which packaged frozen block fillets.

The average price paid for chinook salmon was \$1.30 per pound, \$.30 per pound for coho salmon, \$.10 per pound for pink salmon, and \$.15 per pound for chum salmon (Appendix Table A10). The total value of the raw fish reported on fish tickets in 2000 was \$149,907. This was 50% below the recent 5-year average and 63% below the recent 10-year average (Appendix Table A13). The recent decline in traditional salmon markets has been offset to some extent in Norton Sound with the development of a pink salmon market on even numbered year returns. However, the pink salmon returns have been trending downwards. The harvest of pink salmon combined with exceptionally low harvests of other species resulted in this unusually low fishery value for 2000.

Subsistence Fishery Summary

The department documented the 2000 subsistence salmon harvests in Norton Sound using two methods: 1) postseason household surveys were conducted in Golovin, White Mountain, Elim, Koyuk, Shaktoolik, Unalakleet, St. Michael, Stebbins, Savoonga and Gambell, and 2) subsistence fishing permits in the Nome Subdistrict and the Salmon Lake-Pilgrim River drainage. Council, a seasonal community on the Niukluk River, had no year-round residents in 2000 and was not surveyed. However, an unknown amount of subsistence salmon fishing occurs at Council by Nome residents that is not documented by household surveys or permits. An unknown amount of subsistence salmon fishing by Nome residents also occurs at Woolley Lagoon. In 2000 for the second year, Tier II chum salmon subsistence fishing permits were issued to a limited number of Nome households with the intent that these households would have first priority over other subsistence users if only a small number of chum salmon were available for harvest. Tier I fishing permits were available to all other households when run strength was determined to be adequate. In 2000, 107 Tier I and 10 Tier II permits were issued for Nome Subdistrict (Table 2, Table 3). Seventy-seven percent of the Tier I permits were returned to the department. Twelve households requested permits for the Salmon Lake or Pilgrim River drainage (Port Clarence District). Six of these permits were returned.

The subsistence harvest in the Norton Sound District in 2000 was 77,485 fish (Table 9). This was the second lowest subsistence harvest documented in the seven years of this survey project and the lowest harvest for the district in an even-numbered year when pink salmon returns are strongest. Of the total salmon harvest, 5% were chinook, 22% were chum, 50% were pink salmon, 1% were sockeye, and 22% percent were coho. Nome area permit information and Norton Sound subsistence harvests by community can be found in Tables 2, 3 and 9.

The estimated mean salmon harvest was 90 salmon per household in the Norton Sound District. This includes 5 chinook, 20 chum, 45 pink, 1 sockeye, and 20 coho. Subdistrict 5 (Shaktoolik) accounted for the largest mean household harvest of salmon, an estimated 198 fish. The mean household harvests in the other subdistricts were 48 salmon in Subdistrict 1

(Nome), 123 salmon in Subdistrict 2 (Golovin and White Mountain), 106 salmon in Subdistrict 3 (Elim), 102 salmon in Subdistrict 4 (Koyuk), 108 salmon in Subdistrict 6 (Unalakleet), and 43 salmon in southern Norton Sound (St. Michael and Stebbins).

In the Norton Sound District, 59 percent of the households subsistence fished for salmon and an additional 11% assisted other households in processing subsistence-caught salmon. Three percent of the subsistence salmon harvest was used for dog food. Rod and reel was used by about 88% of households to harvest salmon, while 68% of households used gillnets, 22% used beach seines, and less than 1% used drift nets. Although rod and reel was the most widely used gear type, it accounted for only 11% of the total salmon harvest. Coho and pink salmon was the primary target of rod and reel fishing.

In the Norton Sound District (excluding Nome), 67% of the fishing households responded that their subsistence chum salmon fishing was "poor", 25% responded "average", and 8% responded "very good" (Georgette and Utermohle, 2001).

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, there was no commercial salmon harvest due to inadequate surpluses of chum, pink, and coho salmon. Commercial fishing in the subdistrict is typically very limited because the local salmon stocks are not abundant and the subsistence demand is high. Sport fishing for chum salmon is closed by regulation in the subdistrict. The recent 10-year average commercial harvest is 1 sockeye, 197 coho, 20 pink, and 120 chum salmon (Appendix Table 2). The 10-year average subsistence salmon harvest in the subdistrict is 47 chinook, 147 sockeye, 1,129 coho, 2,864 pink, and 2,906 chum salmon. During the 2000 season, 117 Tier I subsistence fishing permits were issued in addition to the ten Tier II chum salmon subsistence permits. Some individuals were issued both types of permits and multiple permits for different fishing locations.

Subsistence fishing was closed by Emergency order prior to the beginning of the chum salmon run to all Tier I fishers with Tier II fishing only allowed on June 20 in marine waters East of Cape Nome. The Board of Fish 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 over harvest early in the run before it could be fully assessed. Tier I beach seine subsistence fishing for pink salmon was first opened in fresh waters East of Cape Nome on July 7 for 24 hours. Additional subsistence fishing was allowed through the use of emergency orders which specified time, area, and method of harvest to provide fishing opportunities on salmon stocks judged to have adequate surpluses above escapement requirements.

Golovin - Subdistrict 2

Over the past ten years, chum salmon stocks in the Golovin Subdistrict have received little or no commercial exploitation, yet they have seldom exceeded spawning escapement goals. The 2000 Salmon Management Plan stated that the Golovin Subdistrict commercial harvest would be limited to a maximum of 15,000 chum salmon before mid-July in an attempt to protect chum salmon stocks and allow for some harvest while flesh quality is at its best. By that date, the chum salmon run would be assessed and fishing time could be adjusted accordingly.

There were no commercial chum salmon periods during the 2000 season because the buyer wanted to focus on purchasing pink salmon. The Golovin Subdistrict was opened on July 13 to weekly fishing directed at pink salmon with gillnets restricted to no larger than four and one-half inch mesh size. The weekly openings allowed the buyer to coordinate the fleet to areas where fish and tenders would be available to maximize the company's efficiency.

The commercial harvest in Golovin Subdistrict was 164 chum, 1,645 coho and 17,408 pink salmon. The recent 5-year average harvest is 4 chinook, 2,143 chum, 472 coho, and 22,215 pink salmon (Appendix Table 3). The recent 10-year average harvest is 13 chinook, 4,546 chum, 4 sockeye, 787 coho and 11,596 pink salmon.

Moses Point - Subdistrict 3

The Moses Point Subdistrict chum salmon stock has also been experiencing below average runs despite conservative management actions taken over the last ten years. However, the situation had improved slightly as indicated by the Kwiniuk River tower counts, which were at or above the escapement goal from 1994 through 1998. However, in 1999 and 2000 the Kwiniuk River tower counts fell short of the escapement goal. The 2000 Salmon Management Plan anticipated that there would be no chum salmon directed fishery in order to protect the recovering stock. Fishing periods could be scheduled for other salmon species utilizing special restrictions to minimize the incidental chum salmon harvest. It was expected that fishing directed at other salmon species would not significantly affect the subdistrict's chum salmon escapement.

The commercial fishing season did not open until the second week of July and targeted pink salmon. Harvest of pink and coho salmon in 2000 were above average. The 2000 Moses Point Subdistrict harvest was 535 chum, 5,182 coho and 46,369 pink salmon. For comparison, the recent 5-year average harvests are 191 chinook, 1,233 chum, 9 sockeye, 1,706 coho and 43,448 pink salmon (Appendix Table 4). The recent 10-year averages are 132 chinook, 4 sockeye, 1,128 chum, 2,147 coho and 21,774 pink salmon.

Norton Bay - Subdistrict 4

The Norton Bay Subdistrict typically has difficulty attracting a buyer due to its remoteness and its reputation for watermarked fish. Consequently, regulatory changes were

implemented that moved the western boundary from Six Mile Point to Isaac's Point in 1995 and the eastern boundary out to Point Dexter in 1998 in an attempt to improve fish quality. Due to lack 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 run strength and timing. No commercial fishing occurred in Norton Bay in 2000 as no buyer interest was expressed. There has only been three seasons in the last twelve years when salmon have been commercially harvested in the subdistrict (Appendix Table 5).

Shaktoolik and Unalakleet - Subdistricts 5 and 6

Both the Shaktoolik and Unalakleet Subdistricts, which share a common boundary, consistently attract commercial markets due to larger 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. 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, the test net catches, commercial catch indices, and the North River counting tower which is operated in cooperation with Kawerak Corporation, are used to assess run strength of each salmon species. Aerial surveys are frequently not obtained in either subdistrict due to 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's time to assure the harvest is directed on actively migrating salmon and not on milling fish. In 2000, the department's test net and subsistence catches indicated the chinook salmon run was arriving perhaps one week late. After test fishing and subsistence catches began to increase, the first fishing period for chinook salmon in both subdistricts was announced to start on June 22 for 24 hours to test run abundance (Tables 7 and 8). Although the harvest was low during the first period, a second opening was established because of the difficulty in determining run timing and due to reports of high subsistence harvests in marine waters. However, the second opening also resulted in low harvests and no additional periods were allowed.

On July 2 both the Shaktoolik and Unalakleet Subdistricts opened again targeting pink salmon with extended week-long periods. The salmon buyer directed the fishing fleet on times to fish and when to deliver to tenders moving throughout the district. Overall commercial catches of pink salmon were below average which is attributed to a combination of low volumes of pink salmon and lack of fishing interest. On July 24, both subdistricts opened for a coho salmon period. Fishing areas were restricted to reduce the potential for harvesting chum salmon bound for streams outside the subdistricts. Coho catches were average and standard fishing periods continued until the end of August when declining catches resulted in the buyer suspending operations after August 30.

The 2000 commercial catches in the Shaktoolik Subdistrict included 160 chinook, 7,779 coho, 2,751 chum and 185,493 pink salmon harvested by 26 permit holders (Tables 1 and 7). The chinook salmon harvest was 88% below the recent 5-year average and 89% below the recent 10-year average (Appendix Table A6). The coho salmon harvest was 11% above the recent 5-year average and 22% below the recent 10-year average. The total chum salmon harvest in the Shaktoolik Subdistrict was 58% below the recent 5-year average and 80% below the recent 10-year average harvest.

The Unalakleet Subdistrict total commercial catch harvested by 48 permit holders included 582 chinook, 29,803 coho, 2,700 chum, and 17,278 pink salmon (Tables 1 and 8). The chinook salmon catch was 90% below the recent 5-year average and 89% below the recent 10-year average (Appendix Table A7). The coho salmon harvest in the subdistrict was 3% above the recent 5-year average and 31% below the recent 10-year average. The total chum salmon harvest was 78% below the recent 5-year average and 88% below the recent 10-year average.

Escapement

Table 4 summarizes escapement assessments in 2000 for the major index river systems of the Norton Sound and Port Clarence Districts. Some of the salmon assessments are described relative to biological escapement goals (BEG's) for index areas. These BEG's are not historical averages in all cases, but reflect a specific desired level of escapement. BEG's are usually an index of escapement based on peak aerial surveys or historical counting tower passage estimates. Several BEG's will be reviewed during the winter of 2000-2001.

Escapement projects in the Norton Sound District operated by the Department include counting towers on the Kwiniuk and Niukluk Rivers, a test net operated on the Unalakleet River, and a weir on the Nome River. Both the Unalakleet test net and the Kwiniuk tower projects have been in operation for many years. They provide comparable and timely information that is 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 weir project 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. The Shaktoolik River counting tower is no longer operated due to budget cuts. Since the Shaktoolik tower washed out several years in a row, it was decided to cut the project because of the low success rate and fully fund the more consistent performing projects.

Four additional counting tower projects were also operated in the management area this season. The Snake, Eldorado, Pilgrim, and North River projects were setup and operated by Kawerak Corporation with funding support through Bering Sea Fisheries Association (BSFA) and Norton Sound Economic Development Corporation (NSEDC). These projects are cooperative ventures with the department, which provided technical advice and purchased some equipment. These projects supplied important daily information to the

Department that was very useful to the management of local salmon resources and will become more important the longer they run. NSEDC provided additional field staff to nearly all ADF&G and Kawerak projects through an internship program which helped support the projects, while creating job opportunities and training to residents of the area.

Because of a shortage of department staff and poor weather, aerial survey assessments were minimal in 2000. As usual, the Nome Subdistrict streams received the most intensive assessment efforts because the Nome area is strictly regulated, easily accessed by road system, and is exposed to intensive subsistence and sport fishing pressure. Appendix Table A14 lists historical salmon escapement estimates for selected Norton Sound District streams.

Chinook Salmon. The Unalakleet and Shaktoolik Subdistricts are the primary chinook salmon producers in Norton Sound. The Norton Bay, Moses Point and Golovin Subdistricts have also experienced a gradual increasing abundance of chinook salmon returns during recent years. Overall, the 2000 chinook salmon return was below average throughout the Norton Sound District. Eastern Norton Sound streams generally produce larger runs and therefore, support larger harvests. No aerial surveys of chinook salmon were completed due to poor weather conditions. The Unalakleet test net, the Kwiniuk and Niukluk towers, commercial catch rates, and subsistence reports were the primary assessment tools for judging chinook salmon run strength. The district-wide escapement was judged to be slightly below average.

Chum Salmon. Chum salmon escapements were below average throughout most of the management area in 2000. In the Nome Subdistrict, chum salmon escapements were attained for two of the six index streams. The Nome River weir had above average escapement. At Snake River tower and Eldorado River tower the chum salmon escapement was below average. Aerial surveys in the Nome Subdistrict were incomplete because of poor survey conditions. The Niukluk River tower is used as an index for the Golovin Subdistrict. The estimated chum salmon passage during 2000 was less than one-half the recent 5-year average. The Kwiniuk River tower in the Moses Point Subdistrict had a chum salmon count two-thirds of the escapement goal. The Norton Bay, Shaktoolik, and Unalakleet Subdistricts have escapement goals based on aerial surveys. However, aerial surveys are rarely completed, because of the larger size streams with normally marginal survey conditions. Therefore, run assessment relies on commercial catch statistics and escapement assessment relies on test fishing as an index of salmon escapement. Although chum salmon escapements appeared to be achieved in 2000 with above average catches in the Unalakleet test fishery, the North River tower escapement was below average.

Coho Salmon Coho salmon are found in nearly all of the chum salmon producing streams throughout Norton Sound with the primary commercial contributors being the Unalakleet and Shaktoolik Rivers. Because inclement weather is normally experienced in this area during August and September, escapement data is difficult to obtain. Streams in the northern subdistricts of Norton Sound are typically surveyed. The Unalakleet River test net has the most complete data set to evaluate coho salmon escapement in the eastern subdistricts. The newer Nome area assessment projects are intended to monitor coho

salmon as well as chum salmon and are becoming more important to fisheries management. The 2000 coho salmon escapements in eastern Norton Sound were above average while those in northern Norton Sound were more near the recent year averages.

Pink Salmon. During recent years, pink salmon runs to Norton Sound have followed an odd/even year cycle with the even numbered year returns typically much larger in size than the odd numbered years. The 2000 pink salmon runs reflect a continuing downward trend in stock abundance throughout Norton Sound, when compared to aerial surveys in even years in the 1990s. In most cases, escapements were less than one-half of those documented in other even years, yet still much larger than those observed during odd numbered year runs.

Sockeye Salmon. Sockeye salmon are typically found in very small numbers throughout the Norton Sound District with the exception of Glacial Lake where approximately 1,000 fish return to spawn each year. No commercial fisheries targeted these stocks in many years due to their low abundance and importance to subsistence users. Aerial surveys in 2000 for Glacial Lake counted 1,446 fish, which is 70% above average.

Management Issues

- Chum salmon stocks have been depressed throughout Norton Sound over the past ten to twelve years with escapements in the northern subdistricts continuing to be a major concern. In the Fall of 2000 the Board of Fisheries identified the Nome Subdistrict chum salmon stocks as a "Management Concern" and the Golovin and Moses Point chum salmon stocks as a "Yield Concern". The Board is in the process of developing policy and management plans to address these chum salmon issues and further information will be provided in future reports. In 2000, most chum salmon escapement goals were met in Eastern Norton Sound, but fell short in Northern Norton Sound.
- Declining salmon markets have become significant factors for consideration when scheduling fishing periods. Market conditions have caused more restrictive limitations than biological factors at times in recent years for several species. Fish buyers frequently notify the Department that they can only handle a limited quantity of fish with a high quality standard and at a specific rate to optimize their operations. The fishery manager must not only monitor the salmon runs and harvest rates, but must also coordinate schedules with the salmon buyers to protect the limited markets available for Norton Sound salmon. There are some people who feel that as western Alaska fisheries dwindle, the markets will relocate elsewhere. When or if the stocks rebound, it is feared there will be little market interest in salmon from western Alaska, since the markets have become established where stocks are more consistent and have lower transportation costs.
- As a result of reduced subsistence opportunities, and overcrowding of other areas, sport fishing is gaining popularity as a way to target a variety of salmon stocks. Sport fish bag limits are being reviewed, but potential harvest and effort is becoming an

important consideration when planning commercial fishing schedules. Commercial and subsistence management actions must be coordinated with the local sport fisheries.

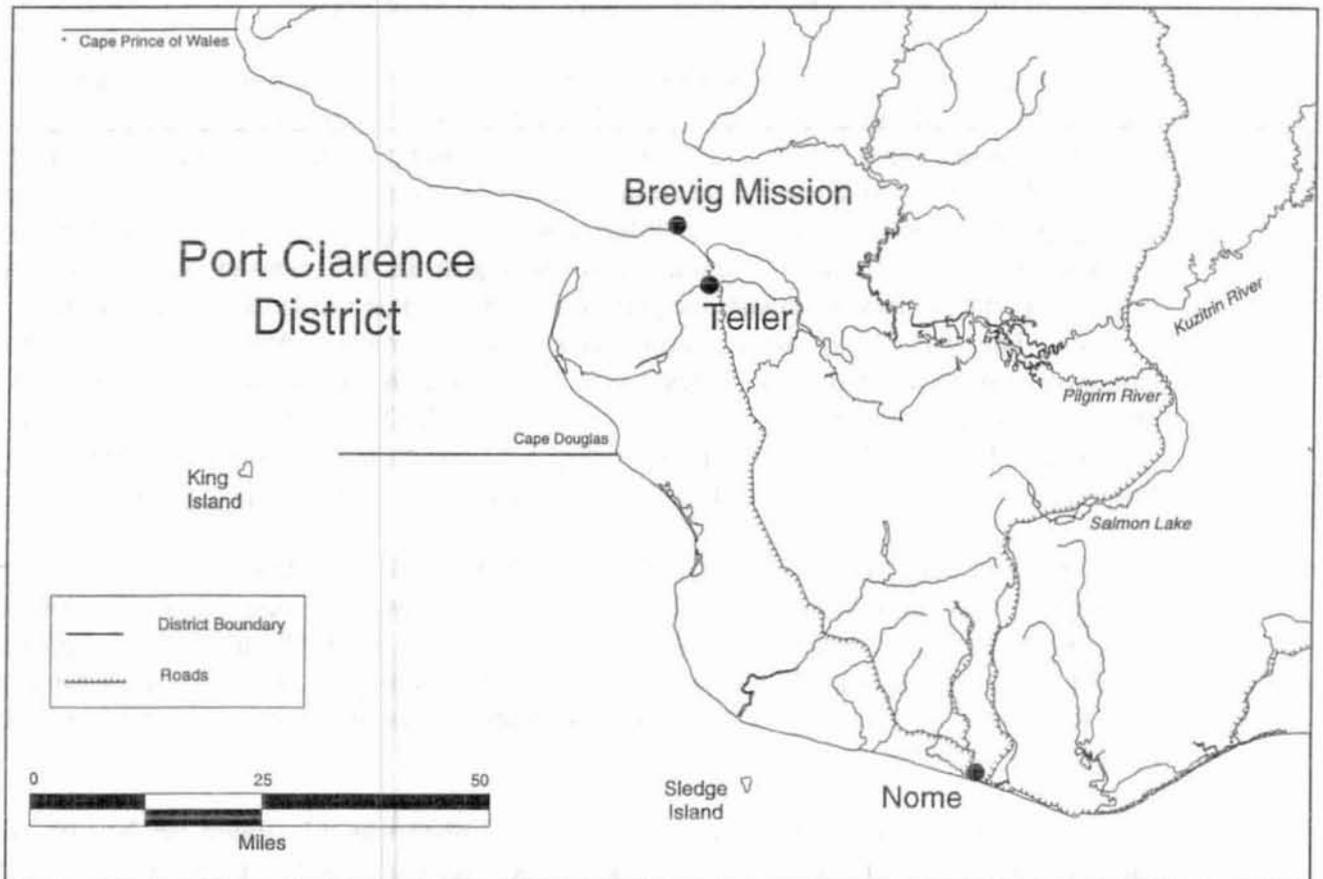
2001 Norton Sound Salmon Outlook

Salmon outlooks and harvest projections for the 2001 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 2001. The chinook run may be well below average with a commercial harvest ranging from 3,000 to 5,000 fish. A pink salmon market is unlikely because of the expected low numbers of pink salmon returning to spawn in 2001. The 2001 chum salmon return is expected to be below average. The market for Norton Sound chum will likely be minimal because of low demand. Because of the expected below average chum salmon run, the commercial chum salmon fishery will be managed conservatively, but may provide a commercial harvest between 10,000 and 25,000 fish. Based on the 1997 parent-year escapement, the 2001 coho salmon run is expected to be below average. The commercial harvest is expected to range from 30,000 to 60,000 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 2). Salmon, saffron cod, whitefish and herring are the major subsistence species; however, other fishery resources are also utilized.



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. Due to the relatively small runs in this area and the existence of a subsistence fishery, commercial salmon fishing has not been reopened.

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 has indicated a majority of the fishers of Brevig Mission fish the northern and northeastern sections of Port Clarence, while Teller fishers utilize Grantley Harbor and Tuksuk Channel. Interviews with local residents have also 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 Table 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 utilized by Nome residents in addition to those of Brevig Mission and Teller. The Alaska Board of Fisheries adopted a regulation in 1972 that closed Salmon Lake and tributaries to subsistence salmon fishing from July 15 through August 31 to conserve declining sockeye salmon stocks. Subsistence salmon fishing permits are required for the Pilgrim River drainage only, 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. This was due in part to a strong sockeye salmon return. Another reason was the extensive subsistence fishing closures in the Nome area that made the Pilgrim River an alternative location to obtain their subsistence needs. In 2000, 12 households requested permits for this area (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 2000 estimated subsistence salmon harvest in Port Clarence District was 6,521 fish (Georgette and Utermohle, 2001). This was the second lowest harvest documented in the seven years of this survey project, and only slightly higher than the 1999 harvest. Of the total harvest, 1% were chinook, 20% were chum salmon, 21% were pink, 44% were sockeye, and 14% were coho. A summary of the subsistence salmon harvest estimates by community is presented in Table 10.

The estimated mean harvest in the Port Clarence District was 42 salmon per household, which included 0.4 chinook, 8 chum, 9 pink, 18 sockeye, and 6 coho. Brevig Mission had a mean household harvest of 41 fish and Teller had a mean household harvest of 44 fish. Households with Pilgrim River permits harvested a mean of 21 salmon per household.

In the Port Clarence District, 49% of households subsistence fished for salmon in 2000. About 11% helped other households process subsistence-caught fish. Three percent of subsistence caught salmon were reported to be used for dog food. Set gillnets were used by 93% of the households to harvest salmon, rod and reel was used by 4%, and drift nets and seine nets used by 3%. Approximately 76% of the fishing households responded that their chum fishing season was "poor" and 16 percent said "average". About 8% said the chum fishing season was "very good". A larger percentage of households responded "poor" in 2000 than in the previous four years (Georgette and Utermohle, 2001).

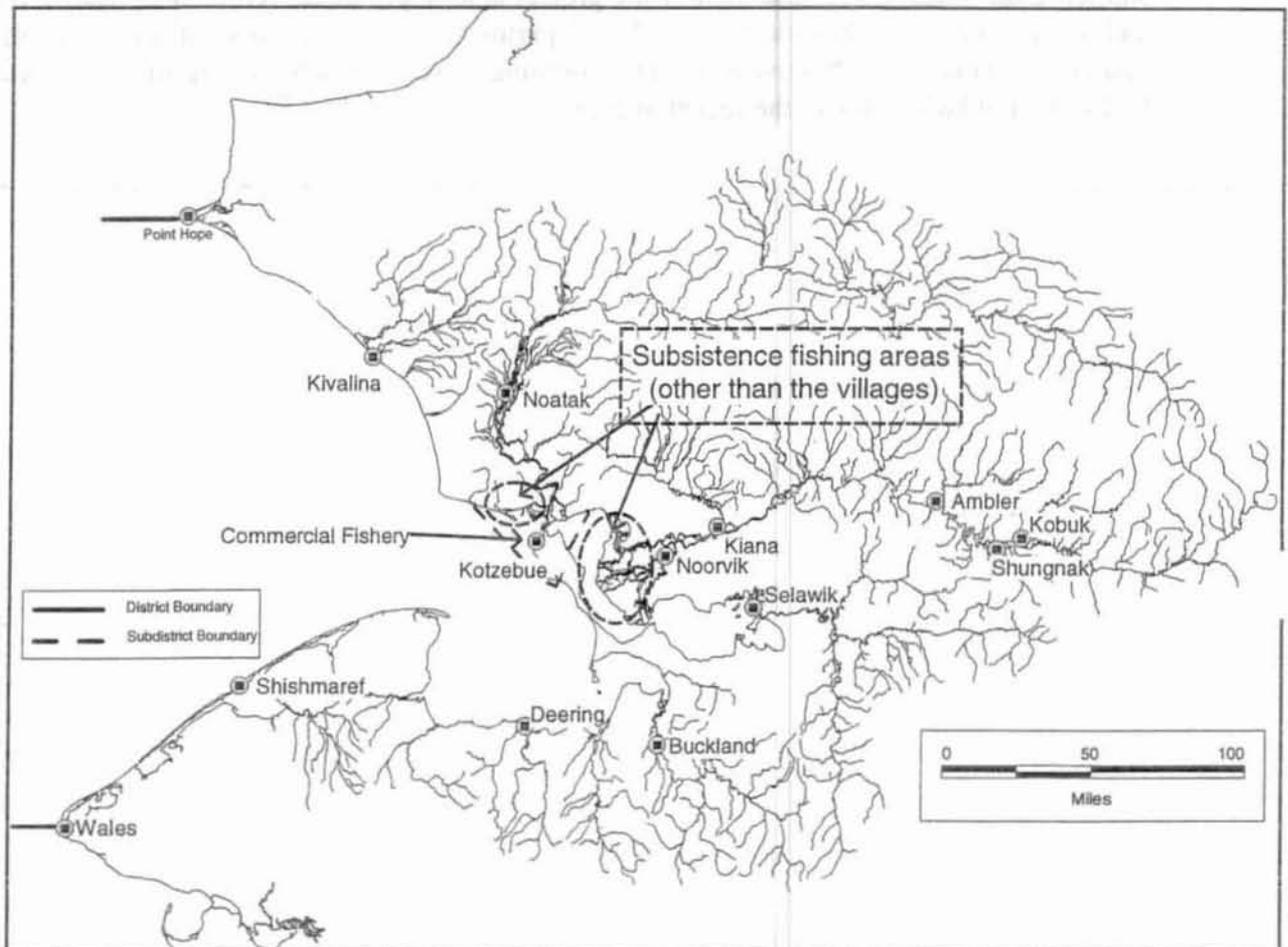
Escapement

Aerial surveys are not typically flown in this district, with the exception of Salmon Lake, because of the higher priority assigned to the Nome area and more intensive commercial fisheries in the Norton Sound District. Aerial surveys show an increasing trend of sockeye returns to Salmon Lake since 1986 (Appendix Table B2). The 2000 aerial survey count was 12,772 sockeye salmon. Recent year counts are in the upper end of the range and reflect an increasing population of red salmon. The department has run a fertilization program at Salmon Lake since 1997. The goal of the project is to apply liquid fertilizer to restore the sockeye population to historic levels. The department is in the process of analyzing the results to evaluate the effectiveness. The counting tower estimate at Pilgrim River was 12,141 fish, which is above the recent average.

KOTZEBUE SOUND DISTRICT

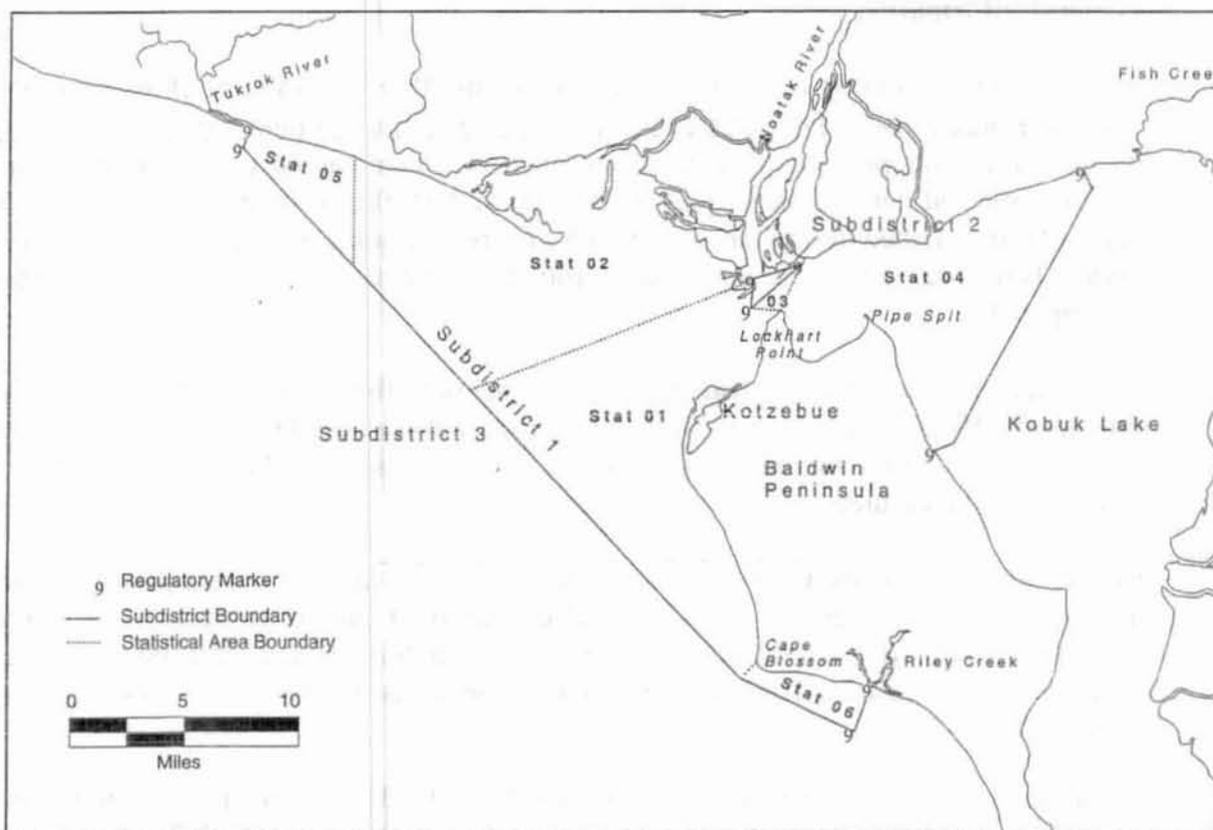
History

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



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 as well during the salmon fishery. There were 191 commercial permit holders in 2000, of which 64 actually fished. An average of 97 permits were active over the ten-year period 1990 to 1999. During the recent five year period, 1995-1999, participation in the fishery has averaged 63 permit holders. Eighty-seven percent of the permittees are residents of the district and 99 percent are 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 that, 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 to have been 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-1970s. 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 began a rebuilding program with an emphasis on attaining escapement goals. Prior to 1987, harvest had been proportional to total return. Since 1995, poor market conditions have caused harvests to fall short of their potential, particularly in 1995 and 1996 when resulting escapements were very strong.

In 1981, a chum salmon hatchery was established at Sikasuilaq Springs, a tributary of the Noatak River. The hatchery was closed in 1995 due to 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%.

General Information

The commercial harvest in the Kotzebue District in 2000 was 159,802 chum salmon, 3 chinook salmon, and 7 Dolly Varden (Table 11). The chum salmon harvest was limited by the buyers shipping capacity, which resulted in a commercial catch below the pre-season projected harvestable surplus of 200,000 to 300,000. Only 64 of a possible 191 permit holders fished during the season with the greatest number participating in any one period being 42. This was up slightly from last year when only 60 permit-holders participated.

The Kotzebue Sound salmon fishery is a set gillnet only fishery with each permit holder limited to 150 fathoms in aggregate length. Most fishers operate their gear as a single unit tied to the beach and anchored offshore. The mesh size of choice was 5- 7/8 or 6 inch stretched measurement.

Norton Sound Seafoods and Great Pacific Seafoods were the two buyers present. They requested that openings be 12 hours and end at 6:00 pm to coincide with airline schedules. There were a total of 28 openings between July 10 and when buyers ceased operations on August 24. Total fishing time was 336 hours or 63% of the 534-hour long-term average.

Chum salmon averaged 8.6 lbs. An estimated 1,370,637 lbs. of chum salmon were purchased at \$.18 per pound. Sixty-two pounds (average weight 20.7) of Chinook salmon were purchased at \$1.00 per pound and 44 pounds (average weight 6.3) of Dolly Varden were purchased at \$.20 per pound (Appendix Table C4). The total exvessel value of the fishery was \$246,786. This was an average \$3,856 per participating permit holder. The fish were packed whole in ice and flown to Anchorage or Unalakleet for processing.

2000 Commercial Season Summary

Inseason Management

The management objectives for the Kotzebue District are to provide adequate chum salmon escapement through the commercial fishery to sustain the run and to provide for the subsistence needs of local users. Due to a lack of funding the only information available on which to base management decisions was the catch rate, age composition, and the results of a test fishery conducted on the Kobuk River near Kiana.

The catch rates in relation to historical averages were used as an indication of the total run strength. Short frequent openings and a low number of participants distributed in an atypical manner complicated this comparison. In order to compare the 2000 catch and effort data with that of previous years, information from the 12-hour periods needed to be combined. Monday through Wednesday was considered as one period and Thursday and Friday to be another, for comparison to the historical two openings a week (Table 12).

A test fishery conducted on the Kobuk River for the eighth year provided the only inseason escapement information. Poor weather and lack of personnel did not allow for aerial surveys during the commercial fishery.

Scale samples were collected from the catch to determine the age composition. This provides an indication of the stage of the run, as older age groups tend to dominate the early portion of the run, being replaced by the younger age classes as the run progresses.

Interest in high quality Kotzebue Sound chum salmon seems to be increasing and 2000 was the first time in several years that more than one buyer has been present. Logistic problems with transporting the fish resulted in reduced fishing time and the potential harvest was not realized. A portion of the Kotzebue Sound chum catch was purchased by the State of Alaska from Norton Sound Seafoods. These fish were distributed in the Nome area to residents affected by area subsistence closures.

Season Narrative

The season was opened on July 10 by emergency order with 12-hour openings from 6 am till 6 PM on Monday, Tuesday, Thursday, and Friday. During the first opening nobody fished and participation was limited to maximum of four through July 14th. As expected the five-year age class made up the majority of the early part of the run. Until July 21st the Kobuk River test fish CPUE was average indicating adequate escapement. From that time till the end of the season test fish catches were well above average.

On July 24th the buyers indicated that they were unable to make shipping arrangements on Mondays and requested that the openings be changed to Tuesday, Wednesday, Thursday, and Friday. As the catch per fisher was above the historical average and the maximum number of fishers participating to that date was a low number of 30 the requested change was implemented. Four day per week fishing continued through August 24 when buying operations ceased. The catch per effort relative to historical averages was high until August 15th and test fish catches on the Kobuk River were the second highest since the project began in 1993. This indicated that the Kobuk run was strong and that the potential harvest was not realized (Table 13, Figure 7).

After the August 15th the catch per unit of effort dropped off to close to historical levels. After this date the catch is made up primarily of salmon bound for the Noatak River and it is possible that the run to that system was somewhat less abundant than to the Kobuk River.

The age structure of the commercial catch was similar to the historical average for three, four and five year olds and below average for the six year class (Table 12, Figure 6).

Subsistence Season Summary

In the Kotzebue Sound District, household surveys were conducted in the Noatak and Kobuk River villages of Noatak, Noorvik, Kiana, Ambler, Shungnak, and Kobuk. Kotzebue has a population of approximately 3,000 people, and was too large to survey house-to-house in an effective and timely way. Therefore the department assessed subsistence salmon harvests in Kotzebue through a mail-out postcard survey. The post card survey is an abbreviated version of the household survey instrument. It asked if households harvested salmon for subsistence use, the quantities harvested, and type of fishing gear used. About 26% of the households receiving the postcard responded. An undetermined number of households were missed by the postcard survey, especially those who have recently moved to Kotzebue (Georgette and Utermohle, 2001).

The subsistence salmon harvest in the Kotzebue District in 2000 was 68,893 fish (Table 14). Chum salmon made up 96% of the catch with the remaining portion a mix of other salmon species, which are present in only small numbers in the district. The 2000 subsistence salmon harvest was intermediate between the high and low harvest in the district in the past 7 years (Georgette and Utermohle, 2001).

The estimated mean salmon harvest was about 56 salmon per household. This included 54 chum, and 2 coho. Noorvik had the highest mean household harvest of 109 salmon. The mean household harvests in the other communities were Noatak and Ambler with 72 salmon, Kobuk with 21 salmon, Shungnak with 64 salmon, and Kiana with 35 salmon.

In the Kotzebue District, 52% of households subsistence fished for salmon in 2000 and about 5% assisted other households in processing subsistence-caught salmon. Seven percent of the subsistence harvest was used for dog food (excluding Kotzebue). Set gillnets were used by 65% of households for harvesting salmon, while 38% of households used rod and reel, and 10% used a seine. Two percent of the salmon catch was caught by driftnets.

In the Kotzebue District, 11% of the fishing households responded that their chum salmon fishing season was "poor," 46% said "average," and 43% said "very good" (Georgette and Utermohle, 2001).

Escapement

A test fish project located just downstream from the village of Kiana monitored escapement into the Kobuk River. The test fish index of 1,481 was the second highest in the eight years the project has been in operation (Table 13). This is graphically presented in Figure 7. Due to a shortage of personnel and poor weather conditions no aerial surveys were conducted in the Kotzebue district in 2000.

2001 Outlook

The outlook for the 2001 season is based on the returning age classes observed in the 2000 season. During the 2001 season, the four-year-old component of the return is expected to be slightly below average, while the five-year and six-year-old components are expected to be average. The three-year old component is generally small, and it too is likely to be near average. The commercial harvest is expected to fall within the range of 200,000 to 300,000 chum salmon, if market conditions can accept that level of harvest.

Section 2: PACIFIC HERRING

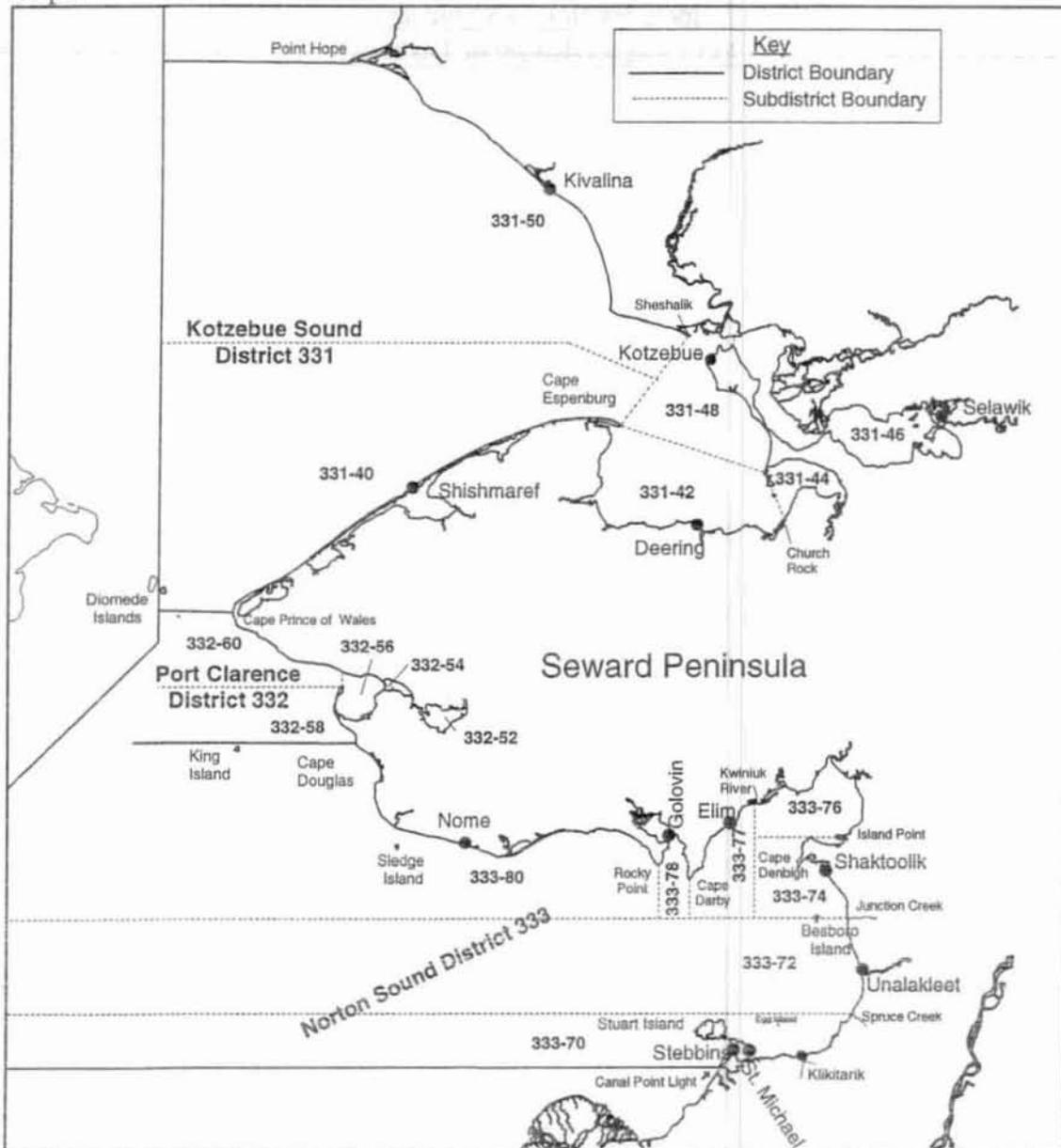
(Includes Norton Sound and
Port Clarence/Kotzebue Districts)

SECTION 2 - PACIFIC HERRING

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 8). 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. The commercial herring fishing districts of Norton Sound, Port Clarence, and Kotzebue Sound.

Spawning Areas and Timing

The arrival of Pacific herring (*Clupea harengus pallasii*) 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 with the primary spawning areas 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 due to 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 have been utilized for subsistence purposes by coastal residents prior to the mid-1800's 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 this century at Golovin Bay in Norton Sound (Appendix Table D1).

Food Herring

Early records indicate that about 3,200 tons of "fall herring" were processed in Norton Sound from 1916 to 1941 (Appendix Table D1). This fishery was dependent on salt curing and declined because of poor marketing conditions arising from foreign competition. 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 Table D2). An average annual harvest of approximately 440 tons was reported in Norton Sound by the Japanese during 1968-1974. The Japanese gillnet fishery was prohibited in 1977.

Sac Roe

Domestic commercial fishing resumed in Norton Sound in 1964 near Unalakleet and continued on a sporadic basis until 1979. Between 1964 and 1978 the fishery averaged about 14 tons of herring annually and targeted on "spring herring" for sac roe extraction (Appendix Table 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, the 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 Table D3). Because gillnet fishers demonstrated that they were capable of taking the available harvest, a regulation was passed in 1981 which prohibited any purse seine gear within Norton Sound.

Prior to the 1984 season, the harvest by beach seine fishers was negligible. During 1984, ten beach seine fishers harvested 327 tons. During their 1984 fall meeting, the 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 have averaged 6.3% of the total reported harvest.

As with any developing fishery, fishing effort increased with each successive season. In 1984 Norton Sound became a Super-Exclusive Use herring fishing district in order to slow growth and bolster local involvement, but with only limited success. The 1987 season had the highest level of fishing effort on record with a total of 564 fishers making at least one delivery, with 559 gillnet and 22 beach seine permits recorded landings. This was more than twice the average effort 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 to the fall 1987 Board of Fish was adopted that changed the Norton Sound Herring Fishing District to Limited Entry status. Beginning with the 1988 season, a moratorium was placed on Norton Sound where 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 being evaluated on a case-by-case basis.

No fishery occurred in 1992 because of a very late ice breakup in Norton Sound. Low prices and declining market conditions resulted in a below average harvest in 1994. More

recently, the harvest has averaged 3,997 tons from 1996 to 2000. 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 46 tons (1981). In addition, during the 1984 season, one ton of *Macrocystis* kelp was imported into Norton Sound resulting in a harvest of approximately 3 tons of product. In response to a public proposal, a Board of Fisheries action prior to the 1985 season resulted in the closure of all spawn-on-kelp fisheries in Norton Sound.

The 1998 herring market was known to be poor before the southernmost fisheries opened. The 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 there would be an opportunity for only a small minority to participate in the sac roe fishery. At their January 1999 meeting, the Board of Fisheries instituted a *Macrocystis* kelp fishery and allowed for a wild *Fucus* spawn on kelp fishery for sac roe permit holders who had not sold sac roe product. The wild *Fucus* harvest would be limited to that area west of Wood Point to Canal Point Light, including Stuart Island.

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 that are 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 that some fish will be held over 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. Prior to 1983, harvests in Norton Sound were regulated on a subdistrict basis so harvests would be dispersed over the entire fishing grounds. This strategy was used to prevent 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. Reduced harvest rates have been discussed as the biomass level approaches the threshold but the situation has never arisen. 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 the flood tide as it crests. The belief that the 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.

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 those gillnetters favor, however, fisheries managers frequently provide less optimal fishing times. The beach seiners have shown the ability 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. Therefore, the management staff have often chosen to reduce the beach seine efficiency by allowing a gillnet opening to occur before the beach seine opening in order to break up school size and reduce 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 prior to a gillnet opening where the potential for waste would have been great had the entire gillnet fleet fished on poor quality herring.

More recently, fishing time has been increased for beach seines because of the difficulty in capturing marketable fish. The present market desires a high roe percent as well as larger size fish. This has been difficult to achieve with beach seine gear.

2000 SEASON SUMMARY

The 2000 herring market was expected to be poor even before the southernmost herring fisheries opened. Low harvests and poor showings of herring brought the price up as the fisheries progressed to the Bering Sea. Still, fewer processors than usual chose to participate in the Norton Sound sac roe herring fishery. This limited the number of participants in the sac roe fishery and slowed the rate of the sac roe herring harvest.

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. The increasing market for sac roe herring and high risk caused a decline in interest with the *Macrocystis* spawn on kelp fishery. Five permit holders registered as participants in the

third year of the *Macrocystis* fishery. Three of the five actually deployed kelp and all three harvested 4,500 pounds of product (Table 18).

Timing is one of the most critical factors in the pound fishery. The operators must predict at least 5 days ahead of time when a spawn may occur to allow time for the kelp to be harvested in Southeast Alaska, shipped, and placed in the pounds. This year, on June 5th, the main wave of spawn began four days before kelp was hung in the water. Some small schools did eventually spawn on the kelp and all harvesting was completed by June 15th. The quantity of product was low, but quality was good. The department estimated the exvessel value of the *Macrocystis* fishery to be \$36,354.

Sac Roe

The 2000 Norton Sound herring fishery opened by emergency order on June 7th with four companies registered to buy. The total harvest of sac roe herring based on fish ticket data was 4,471.7 tons of herring with an average roe recovery of 9.4 percent and 15 tons of waste (Tables 1 and 2). Recently, buyers are reporting harvest with a 10% reduction due to 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. Since 1981, catches have averaged 4,194 tons.

There were 94 sac roe fishers who made at least one delivery during the season. Three beach seine permit holders participated in Norton Sound fishery in 2000, but found it difficult to land marketable herring. The problem with beach seine gear this season was that it could not select for the most desirable older age class herring with larger sized egg skeins. The total gillnet harvest landed by 92 permit holders was 4,390.4 tons with a 9.4% average roe recovery. The three beach seine fishers landed 81.4 tons of herring with an average roe recovery of 9.4% (Table 17, 18).

Four companies were present on the grounds during the 2000 season with 5 processors and 18 tenders registered. Based on final operations reports, it appears the average price advanced for a ton of 10% roe herring was \$200. The total value of the herring harvest to the sac roe fishers was approximately \$894,340 which averages out to \$9,514 for each permit holder making a landing.

Fishery Management/Emergency Orders

This year's preseason herring biomass projection called for an allowable herring sac roe harvest of 5,065 tons. With an expected low daily processing capacity, managers were prepared to open the season early to catch the first wave of fish and spread the harvest over several days. Recent drops in sac roe market interest results in an increasing demand for high-quality product. Fishers are required to be much more selective and managers have responded by increasing fishing time to allow fishers more time to locate acceptable herring. Managers are required to work in close cooperation with the Norton Sound herring fishing industry.

Bering Sea ice conditions allowed the first tenders to arrive at Norton Sound on May 22nd. Significant breakup of shorefast ice began moving around May 29th with the first herring captured in department test nets on June 1st. Water temperatures were warm for much of Norton Sound, however shorefast ice lingered over the preferred spawning area between Wood Point to Whale Island including St. Michael Bay. On June 3rd, the first herring were observed by aerial survey at both the west side of Cape Denbigh and along the north coast of St. Michael Island (Table 15). The biomass built quickly with a major spawn beginning June 5th along the west side of Stuart Island.

Early commercial gillnet test samples were poor due to high male counts with sex ratios beginning to improve in Subdistrict 1. The first commercial period was announced to open on June 7th for beach seine gear in Subdistricts 1 and 2. Two sets were made and both were released because of high male counts and immature roe. A 4 hour gillnet period followed the same day in Subdistrict 1 with gear limited to a single 50-fathom shackle to test herring quality. Effort was low and quality was acceptable. The progress of the period was monitored closely. Fishing time was extended by two hours and again by four hours. Quantities of good quality fish were low and spread over a wide area.

Subsequent commercial gillnet test fishing indicated marginal quality herring present in Subdistricts 1 and 3. The second beach seine period on June 8th had effort concentrated at Besboro Island where only one of three sets was pumped due to a dominance of small size herring in samples even though roe recoveries were within the typically acceptable range. The third beach seine period on June 9th had similar results with 2 small landings. Additional beach seine fishing was opened on June 10th and 11th. Fish schools were wrapped, but not pumped because small size herring continued to be present. Beach Seine fishers ended their season far short of their allocation because they were unable to selectively harvest herring that could meet market standards.

Gillnet fishing resumed in Subdistricts 1, 2 and 3 on June 9th with one shackle, but was extended only in Subdistrict 1 because of low quality due to high male counts in Subdistricts 2 and 3. Similar daily openings occurred on June 11 through June 14 except that 2 shackles of gear were allowed in Subdistrict 1 and only one shackle in Subdistricts 2 and 3 as required to maintain roe quality. The volume of good fish in Subdistrict 3 was small and difficult to separate from younger age classes and spawnouts. The last gillnet period of the season in Norton Sound occurred on June 15th in Subdistrict 1.

The 2000 Norton Sound herring sac roe fishery took place over a 9-day period from June 7 through June 15. Twenty-five emergency orders were issued. Eight gillnet periods were opened with a total fishing time of 89 hours. Beach seine fishing was allowed for 6 periods with a total of 26 hours.

Catch Reporting and Enforcement

Herring buyers registered for the 2000 season communicated exceptionally well with department daily 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. Few fishing opportunities were missed as a result of inadequate notice time. Buyers also had a much greater role in deciding where and when to fish than in past years because of the limited market. Buyers were required to report herring purchases daily (8:30 a.m.) and three hours following the closure of each period. Daily reports were required to be called in to the Unalakleet office. In general, compliance with requested catch reports was very good. Nearly all fishing vessels in the fleet have VHF radios, but their activities are often beyond normal ranges. This year, the manager made regular and emergency announcements over both VHF and SSB radios simultaneously to save time and assure everyone got the same message. Communications with the field camps was accomplished with marine VHF, SSB or by aircraft radio from the aerial survey plane.

Protection efforts in Norton Sound consisted of 2 single engine aircraft and a small boat. Personnel consisted of 2 permanent, full-time Fish and Wildlife Protection officers. Three citations were issued all relating to fishing beyond a closure.

Abundance and Research

Two Department field crews were operational during the 2000 season. One crew operated from Cape Denbigh and the second crew operated from Klikitarik. A third test fishing crew 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 acting area management biologist, the regional management coordinator biologist, two seasonal technicians and a volunteer catch monitor. Norton Sound Economic Development Corporation supplied one fishery intern to assist ADF&G in test fishing and sampling during the herring fishery.

Test fish crews sampled 2,349 herring caught with variable-mesh gillnets from June 1 to June 16 for biological data. Age 7 herring dominated the return in biomass making up 25.7% (DuBois 2000) The biomass consisted of 54.1% age 9 and older herring. Recruit herring represented 35.0% of the return in numbers of fish.

Biomass Determination

The peak aerial survey count combined one survey on June 12th in Subdistricts 4, 5, and 6 with another survey on June 13th in Subdistricts 1, 2, and 3 (Table 15). The herring spring migration was unusual this year because of the shorefast ice lingered in the main spawning areas while the remainder of Norton Sound warmed at a near normal rate. Herring first spawned on the west side of Stuart Island June 5th which is typically the last place to receive spawn. The peak survey was late in the season due to poor survey conditions which counted primarily schooling fish in spawned-out configurations. Twenty-three and a half miles of

spawn was observed and an estimated 15 tons of herring was noted as waste in 3 shackles of abandoned gillnets near Cape Denbigh.

2001 Outlook

The biomass projected to return to Norton Sound in year 2001 is 26,295 tons (DuBois and Hamner, 2001). A 20% exploitation rate would result in a harvest of 5,259 tons. A maximum of 320 tons of herring are to be reserved to allow for the harvest of no more than 90 tons of spawn on kelp. This leaves 4,939 tons for the sac roe harvest (4,445 tons by gillnets, 494 tons by beach seines) and any subsequent bait fisheries.

The year 2001 herring fishery will be opened by emergency order and the fishery will close by emergency order when up to 20% of the available herring biomass has been harvested. Varied harvest rates may be applied to individual subdistricts based on biomass distribution, roe quality, weather, and sea ice conditions. Ages 8 and 5 are expected to comprise nearly one-half of the returning biomass (27.7%, and 20.2% respectively). Age 9 and older herring are expected to contribute over 40% of the return.

PORT CLARENCE / KOTZEBUE DISTRICTS

Introduction

The regulation book states that in the Port Clarence and Kotzebue Districts, 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, prior to the 1987 season, no spring sac roe commercial fisheries had ever occurred within these districts. Interest in exploring these stocks has been expressed in recent years by industry personnel operating in the Norton Sound District. However, no large-scale effort to develop the fishery has occurred due to 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, it is assumed 165 tons guideline harvest is still in effect. Presently purse seines, beach seines, and gillnets are legal commercial gear within these districts. Spawn-on-kelp fisheries are also allowed in regulation. Recent attempts at open pound *Macrocystitis* harvest 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, the fisheries in these districts have been limited by lack of markets. Local

fishers and fishery operators in Kotzebue, Brevig Mission and Nome have also expressed interest in developing a spawn-on-kelp fishery within these districts.

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 that herring populations from Golovin 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.

Zostera 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 does not preclude the possibility of the occurrence of more southern stocks from utilizing this

region, i.e, stocks which winter near the Pribilof Islands and migrate to the western Alaska coast to spawn. It is unlikely however, that herring stocks along the western Seward Peninsula migrate to the central Bering Sea for wintering, but rather remain in coastal lagoons, bays or inlets which are warmed by river discharge under the ice (Barton 1978). This may be a major factor in explaining size differences, i.e., environmental conditions. 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 very difficult in the Port Clarence District due to organic coloring of the waters of Imuruk Basin, Tuksuk Channel, Grantley Harbor and to a lesser extent, Port Clarence. Aerial surveys were impractical in Imuruk Basin and Tuksuk Channel. Additionally, 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 stained to a high degree over the winter and takes some time to clear once the ice melts. Typically, the 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 the herring mass just prior to the ice moving. One or two surveys have been flown each of the past several years, but virtually no herring have been observed because the narrow window of time for seeing the fish has been 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. The fishery typically 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 the harvest. However, no bait fishery has occurred since 1996 (Table 19).

Sac Roe Fishery

The Port Clarence fishers have been 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 *Zostera sp.* nearby.

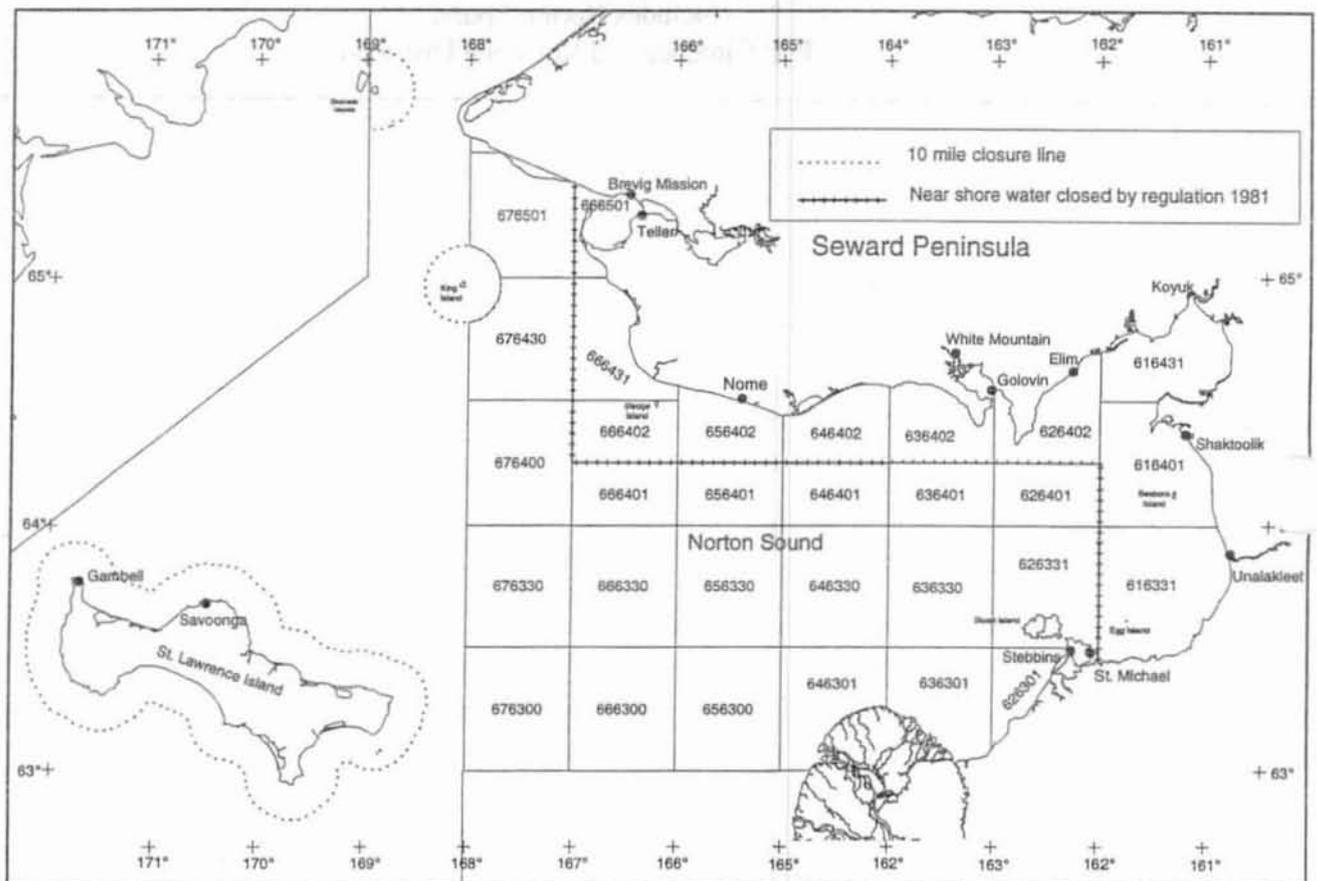
SECTION 3: KING CRAB
(Includes Norton Sound,
Port Clarence and Kotzebue Districts)

SECTION 3 - KING CRAB

INTRODUCTION

Norton Sound

The Norton Sound Section of the Northern Bering Sea District consists of all waters in statistical area Q that are 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 12).



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

A large vessel summer commercial red king crab (*Paralithodes camtschatica*) fishery has existed in the Norton Sound Section from 1977 through 1992 (Appendix Table E3). No summer commercial fishery occurred in 1991 due to a lack of staff necessary to manage the fishery. The budget had been cut the previous winter. In 1992, the large vessel summer commercial fishery resumed. Regulation changes adopted during the March 1993 Board of Fisheries meeting changed the character of the fishing fleet to that of a small boat fleet. A superexclusive designation went into effect for the Norton Sound

commercial crab fishery June 27, 1994. 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. A vessel moratorium was put into place prior to the 1996 season with the intention of creating a license limitation program. The North Pacific License Limitation Program (LLP) went into effect for the Norton Sound crab fishery January 1, 2000. A vessel that exceeds 32 feet in length overall must hold a valid crab license issued under the LLP by the National Marine Fisheries Service.

The National Marine Fisheries Service conducted their most recent trawl survey to examine the abundance of Norton Sound red king crab in late August 1991 (Appendix Table E5). The results of that survey as compared to the 6 previous trawl surveys show a gradual trend of increasing abundance since 1982. The 1991 survey found 1.3 million pounds of legal king crab in the commercial fishing district. NMFS has not made a survey of Norton Sound since 1991. The quota for the Norton Sound Section for the 1996 season had been set at 340,000 pounds, to approximate an exploitation rate of 10%.

The Alaska Department of Fish and Game conducted a trawl survey to examine the abundance of Norton Sound red king crab from August 7 through August 18, 1996 (Appendix Table E5). A population estimate was generated which indicated the legal biomass had declined to 40 percent of the biomass estimated in 1991. The results from the 1996 trawl survey prompted the fishery managers to reduce the harvest rate in the 1997, 1998 and 1999 commercial fishery to five percent of the legal biomass and set the guideline harvest at 80,000 pounds. This was a significant reduction from the previous exploitation rate and guideline harvest.

The Alaska Department of Fish and Game conducted its most recent trawl survey in August of 1999. A population estimate generated after the survey indicated a legal male biomass of 3.8 million pounds (Appendix Table E5). The 1999 Norton Sound trawl survey estimated an all-time high prerecruit-1 male abundance. This also indicates that the legal component continued to expand at least one more year. Conversely, the exceptionally weak prerecruit-2 abundance estimate from the 1999 trawl survey suggested that in the wake of this abundance of newly legal crab is at least one year of weak recruitment. The 2000 winter crab study data also indicated this trend of increased legal crab abundance for the 2000 season and weakened recruitment in the near future.

During the March 1999 meeting of the Board of Fish, a new management strategy was put into place for the Norton Sound summer red king crab fishery (5AAC 34.915). The threshold level of abundance of legal male red king crab biomass was set at 1.5 million pounds. This means 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 be rebuilt. If the legal biomass is 2.5 million pound or more, the harvest rate will be no more than ten percent.

A length-based model approach to estimating population abundance of red king crab was developed by Jie Zheng, Gordon Kruse and Lowell Fair. This model incorporates trawl

surveys, winter and summer pot studies, and summer and winter fisheries data from 1976 to present. The model can be used to project crab population estimates in years when there is no trawl survey, therefore improving the management of the Norton Sound red king crab fisheries.

Data from the 2000 winter crab study was incorporated into the length based crab model to generate a population estimate for the 2000 summer red king crab fishery. With an expected legal male crab abundance of 4.2 million pounds, the 2000 summer commercial crab fishery was managed for a guideline harvest goal of 336,000 pounds. A 336,000 pound harvest equates to an 8% exploitation rate in accordance with the harvest strategy set by the Board of Fish. Management biologists decided on an exploitation rate of 8% due to the low recruitment expected in the future.

St. Lawrence Island

The St. Lawrence Island Section lies immediately west and north of the Norton Sound Section. Until recently, the Dutch Harbor fishing fleet has been the primary commercial group interested in that area. The only reported commercial catches to date in the St. Lawrence Island Section were made in 1983 when 52,557 pounds of blue king crab were delivered from 13 landings, in 1989, when 3,603 pounds of red king crab and 984 pounds of blue king crab were delivered from 8 landings, in 1992 when 53 pounds of blue crab were landed and in 1995 when 7,913 pounds were delivered from three landings.

In 1983, the commercial crab fleet concentrated near the southeast shore of St. Lawrence Island. The following year a regulation proposal to close the waters within 10 miles of all inhabited islands within the section was adopted in an attempt to protect stocks targeted by local fishers and reduce impacts on subsistence marine mammal harvests during the winter. During the 1989 season, three fishing vessels prospecting in that section found relatively few blue king crab near rocks and shoals still open to commercial fishing, but red king crab were discovered in low densities near Kivalina, the northern boundary of the section. The villagers of Little Diomed Island have also traded and sold winter caught blue king crab with residents of Nome and other villages for years. The Department has not been able to obtain an accurate estimate of the magnitude of this trade. The remoteness of this village is also a factor contributing to the lack of catch records. Current regulation allows the commercial harvest and sale of king crab near shore during the winter. The Board provided the same provisions in the regulation as are in effect for Norton Sound to allow a commercial winter fishery. However, local residents of St. Lawrence Island have decided not to export any of their winter catch for commercial sale.

2000 COMMERCIAL FISHERY

Norton Sound Summer Commercial Fishery

The 2000 summer open access commercial red king crab fishery opened at 12 noon, July 1 in the Norton Sound Section. The season's guideline harvest limit was 336,000 pounds. An emergency order relaxing the closure line in the vicinity of Unalakleet was announced at the fishery opening. The eastern line was defined as running from 64° 15' N. lat., 161° 30' W. long. southward to 64° 00' N. lat., 161° 30' W. long. then eastward to 64° 00' N. lat., 161° 15' W. long. and again southward to 63° 28' N. lat., 161° 15' W. long. The line jogged around Besboro Island. Residents of Eastern Norton Sound requested the relaxation of the closed area to allow access to fishing grounds closer to their communities.

The first delivery was made July 3. The open access fishery was closed by emergency order at 12 noon, August 29 to enable the Norton Sound CDQ allocation to be harvested. A total of 16 fishing vessels and 17 permit holders were registered for the open access summer commercial crab season. One floating crab processor operated in Norton Sound during the fishery, and an independent observer was placed on board for the duration of the fishery. A few fishers acted as catcher sellers and coordinated flying live crab to buyers in Anchorage. All vessels participating were 32 feet or less.

Catch reporting logs were kept by buyers and by skippers of catcher vessels for each statistical area fished. Buyers verbal reports were relayed daily by 9:00 a.m. to the ADF&G office in Nome. Vessel reports from fishers and Catcher/Seller fish tickets were required every Monday for the duration of the fishery. Compliance with reporting requirements was good. Catch statistics can be found in Table 20.

Statistical Summary

The total commercial catch for the open access crab fishery was 108,249 crab (Table 20). A total of 297,654 pounds were harvested. Fourteen vessels made deliveries, and 17 permit holders fished. A total of 185 landings of king crab were made. Average weight for commercially caught crab was 2.7 pounds per crab. A total of 560 pots were registered and 6,121 pot pulls were recorded during the fishery. The price paid per pound ranged between \$2.25 and \$4.00. The fishery value was approximately \$672,433. Historical catch statistics can be found in Appendices Tables E1-E3.

Fish ticket reports document that 6 statistical areas were fished. Statistical area 636401 had the highest catch with 126,994 pounds taken or approximately 43% of the entire harvest. The second highest catch came from statistical area 656401 which was 94,813 pounds or 32% of the harvest. The overall CPUE for the 2000 fishery was 17.7 crab per pot. Statistical area 666401 had the greatest CPUE with 27 crab per pot. The 2000 open access summer fishery had the highest number of participants since the 1996 fishery

(Appendix Table E3). This is due to the guideline harvest increase from 80,000 pounds to 336,000 pounds and attracting more fishers, and the presence of a floating crab processor in Norton Sound.

Commercial Catch Sampling

Carapace length measurements and shell age were collected from 17,197 legal male red king crab throughout the 2000 summer fishery. Carapace age was classified as new (11 months old) or old (at least 23 months old). Overall mean carapace length of the legal male red king crab sampled was 116 mm. Male crab with new shell carapaces made up 83.5% of the total legal male king crab sampled, and old shell crab made up 16.5% of the sample. Recruit crab made up 40.9% of all legal male crab sampled. Postrecruit crab made up 59.2% of the legal crab sampled.

Enforcement

The Nome Fish and Wildlife Protection officer was unable to patrol the fishery. No cases were filed during 2000.

Norton Sound Winter Commercial Fishery

Regulation allows a winter commercial fishery in the Norton Sound Section from November 15 through May 15, the fishery typically takes place near Nome. The winter commercial fishery is required to take place from the ice, not from vessels. During the winter of 1999-2000, ten commercial fishers reported selling a total of 3,045 red king crab (Appendix Table E4).

CPUE was 2.5 crab per pot. Average weight during the winter fishery was 2.6 pounds per crab. The first delivery was made January 7, 2000 and the final delivery was made May 12, 2000. This year's winter fishery had the highest level of participation and largest crab catch since the 1994-95 season (Appendix Table E4).

The harvest is divided between local residents who buy crab directly from the fishers and other non-local markets such as Anchorage. Crab are sold in Nome for an average of ten dollars per crab, roughly \$3.69 per pound. The 1999-2000 winter catch of 7,894 pounds was estimated to be worth about \$29,300.

Most fishers consider commercial crabbing a sideline and hold other jobs. Usually, two or three of the winter crab fishers sell the majority of the crab. Because the volume of crab involved is low, no processor has found it profitable to operate locally. The crab sold locally are all sold fresh as are those shipped to Anchorage or other non-local markets.

SUBSISTENCE FISHERY

Red king crab are utilized by Norton Sound residents mainly during the winter. Fishing occurs through cracks or holes cut in the ice with the use of handlines and pots. In order 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 prior to fishing and to record daily effort and catches on these permits (Appendix Table E4).

The first year subsistence permits were required had the highest number of permits issued to date and a relatively high harvest rate were recorded. The fishery declined sharply the following year and remained at very 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 due to poor ice conditions, and changes in the nearshore winter distribution of crab. All these factors probably had some effect on the success of the winter fishery in varying degrees. During the 1978-79 winter fishery, the king crab population was still in relatively high abundance. Despite this relatively large population, winter catches were the poorest on record indicating that 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 much lower level. Subsistence fishing success during the winters of 1982-83 through 1986-87 had improved due to a rebuilding of the population and increased use of more efficient gear (pots instead of handlines). Unstable ice conditions and record snowfalls adversely effected the 1987-88, 1988-89, and 1992-93 catches. During years of stable ice conditions, approximately 100 fishers have averaged 100 crab each.

The 1999-2000 season had relatively stable ice conditions near Nome and Elim, however areas near Golovin Bay and Eastern Norton Sound were less stable. Subsistence fishers obtained 98 permits (Table 21). Of the 65 permits returned, 55 reported fishing. Fifty-three fishers reported using pots, two reported using handlines. Permit data indicates the subsistence harvest consisted of 5,803 male crab and 12 female crab. The average catch for fishers was 106 crab. This is well above the average since 1978 (Appendix Table E4).

STOCK STATUS / RESEARCH

There has been a change in the character of the summer commercial fishery since 1993 due to regulation changes affecting pot limits, opening dates and a regulation making Norton Sound a superexclusive registration area. The quality and quantity of data collected since the 1993 summer crab fishery has differed greatly from previous years due to the nature of the small vessel fishery. A floating processor took part in the 2000 fishery, therefore an independent observer was placed onboard. This was the first time since 1992 that an independent observer was placed on board a crab vessel in Norton Sound.

In 1976, when monitoring of the Norton Sound king crab population first began, the population was mainly composed of prerecruit and recruit crab. The initial population assessment survey by the NMFS estimated the legal male king crab population at 8.1 million pounds (Appendix Table 5). The legal male crab population peaked in 1978 at an estimated 11 million pounds. During the 4 years following 1978, recruitment into the legal male crab population was very low. Subsequent NMFS surveys in 1979 and 1982 documented a population of predominantly postrecruit crab, and estimated the population had declined to 2.6 million pounds by 1982. Beginning in 1981, sublegal crab abundance began to increase, and by 1983 recruitment into the legal male population also began to increase. No assessment work was conducted in 1983 or 1984. However, samples of the commercial catches indicated a significant increase of recruit crab into the legal male population; from a historical low of 10% in 1981 to 59% in 1984.

In 1985, both NMFS and ADF&G conducted population assessment surveys in Norton Sound (Appendix Table 5). After the commercial fishery in 1985, NMFS conducted a population assessment survey using trawl gear over a slightly larger area than that surveyed by the Department. Male king crab sampled in NMFS trawls were in the process of or had just molted with the result being that their estimate of 3.4 million pounds of legal male king crab included some recruitment. Adjusting this estimate for molting, and including the summer commercial harvest, an estimated three million pounds were present prior to the 1985 August fishery. Both surveys documented relatively substantial numbers of recruit crab and a healthy percentage of prerecruit crab.

During September of 1988 NMFS conducted a fifth population assessment with trawl gear. They sampled an area roughly the same size as in 1985, but increased sampling frequency in the proposed mineral lease area near Nome. The timing of the study, which occurred during the male molt, was almost a month earlier than similar surveys in the past. Nearly all the 1988 catch was in pre-molt condition. NMFS estimated 3.0 million pounds of legal male and 1.0 million pounds of prerecruit-one male red king crab; totaling 4.0 million pounds. Annual mortality was estimated at approximately 20% or 0.8 million pounds. Ignoring growth and the winter harvests, the population prior to the 1989 summer fishery would have been 3.2 million pounds, very close to the 1985 trawl estimate of 3.4 million pounds.

NMFS conducted a sixth trawl survey of Norton Sound during late August 1991 with a reduced number of tows. Each station had only a single sampling tow, as compared to each station having both a day and night tows during previous surveys. This reduction in sampling had the effect of introducing more variability into the estimate. The legal crab biomass in the summer fishing area was estimated to be 3,400,000 pounds and the total Norton Sound legal biomass was estimated to be 4,009,000 pounds. Since the survey occurred prior to the molt, a mortality of 10% was assumed for the year following the estimate. With no summer or winter fishery data to compare with the survey results, a conservative biomass of 3,400,000 pounds was used as the basis for the 1992-96 harvest guideline. The Norton Sound red king crab population was thought to be stable with harvest set near 10%.

NMFS has discontinued their trawl surveys of Norton Sound. The Department was able to utilize appropriated money for a trawl survey during August of 1996 and 1999. The methodology used was very similar to that used by NMFS in previous surveys. The legal biomass was estimate to be 1,600,000 pounds in 1996. This is a significant decline from the previous survey. The Department decided that the population was far below its carrying capacity and was closely approaching the threshold below which a commercial harvest should not occur. However, there were indications that the sublegal portion of the population were relatively strong in comparison to the legal portion. It was decided that the exploitation rate would be reduced to five percent of the legal biomass during the 1997-1999 fisheries. This reduced harvest rate and the expected strong recruitment allowed for a rapid recovery of the legal biomass.

The survey conducted during August of 1999 found a significant increase in the legal male population of red king crab (Appendix Table E5). The population estimate was 1.6 million legal crab or 4.8 million pounds.

FUTURE INVESTIGATIONS

The trawl survey that occurred during the summers of 1996 and 1999 in Norton Sound was made possible by a budget increment passed by the legislature. This is to be a regularly scheduled survey rotating between districts. Both funding for a sustained winter research program and a triennial trawl survey to evaluate Norton Sound crab populations were provided for in that legislation. A winter pot survey is planned during February, March, and April. The results of the recent trawl survey and the upcoming winter study will be used in a model to project the summer 2001 legal biomass and an appropriate harvest guideline.

OUTLOOK FOR 2001

After the 1999 trawl survey, the legal red king crab population was estimated to be near the historical high biomass level. The population level had nearly tripled since 1996. The legal male biomass is now believed to be within the range staff believes will produce the highest sustainable yields. Current size composition data indicates, that the portion of crab population classified as large old shell males is some what depressed but is expected to increase in number somewhat in the next few years. Large old-shell males are responsible for most reproduction within the male population. It will be important to maintain this segment of the population to provide for continued recruitment. The guideline harvest for the 2001 summer fishery was determined using the length based crab model incorporating only the summer 2000 data. The winter pot survey did not occur in 2001 because of poor ice conditions. The GHM was set at 303,000 pounds of red king crab.

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

SECTION 4 - MISCELLANEOUS SPECIES

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, while winter catches are stored frozen. Fish are utilized both for human consumption and for dog feed. Fish taken for commercial purposes are mainly sold locally, although some are shipped from the area.

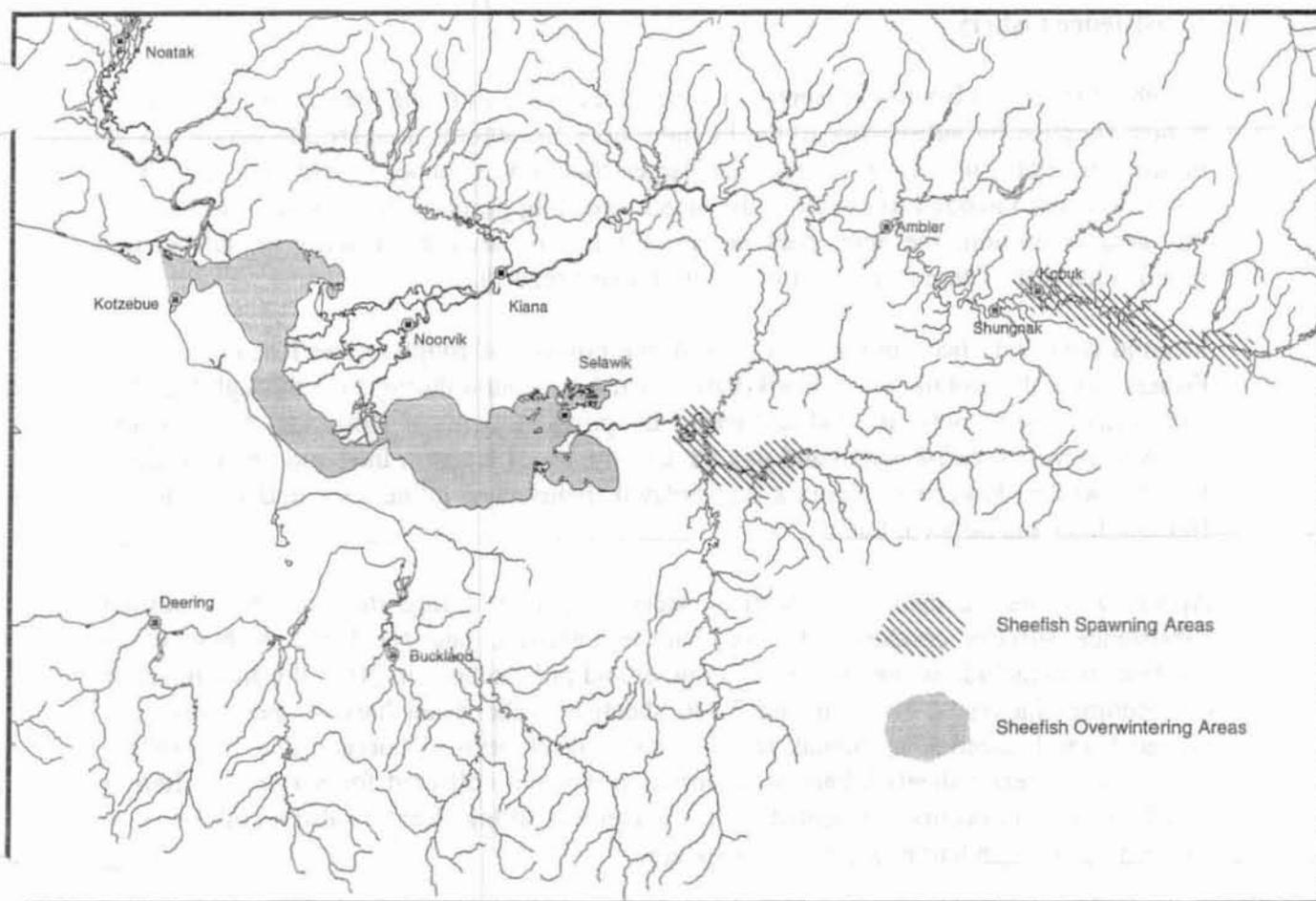
Subsistence harvest of most species is not limited by regulation. Commercial harvest may be prohibited in some freshwater areas, but limited commercial endeavors are allowed in many areas under terms of a permit.

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 18). 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 with males reaching 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 being 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 - 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. During some years, incidentally caught inconnu are also sold by commercial salmon fishers when there is a market, but only in small amounts. Reported harvest and effort in the commercial fishery has declined in recent years and no commercial effort was reported in 2000 (Appendix Table 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. There is no requirement 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 Table F2 estimates sheefish catches reported during the fall chum salmon subsistence surveys conducted by Subsistence Division, and for lower Kobuk River residents may include winter as well as summer and fall catches. In 2000, the Kobuk River communities harvested an estimated 7,446 sheefish. The mean harvests per household ranged from 1 sheefish in Noatak to 29 sheefish in Noorvik (Georgette and Utermohle, 2001). Subsistence sheefish harvest information was not collected for Kotzebue where a sizable ice fishery occurs for sheefish in late winter and spring. There is also no information concerning sheefish harvests in the Selawik area.

Escapement

In recent years aerial surveys have been conducted on key inconnu spawning areas incidental to the effort of enumerating salmon. These surveys have primarily been conducted along the upper Kobuk River in September. Survey conditions historically result in either very few or no inconnu being observed (Appendix Table F3). During these surveys, species identification has been a problem in some years. Surveys were not conducted in 1985 through 1990 due to high, turbid water, poor weather conditions, or lack of personnel. Incomplete escapement and catch data provide little basis for assessing the current population status of inconnu in the Kotzebue district, however there was some local concern that the inconnu stocks are 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 from the village of Kobuk, with the greatest observed concentrations 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 that 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 have disagreed on the distinguishing Dolly Varden characteristics and distribution of Arctic Char and Dolly Varden, most now agree that char in this area are the northern form of Dolly Varden. In order to eliminate confusion, in this report these fish will be 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 (Appendix Tables F4). Regulation changes in 1976, which closed the commercial salmon fishery on August 31, have 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. 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 Table F4). Spawning and overwintering Dolly Varden (locally called trout) typically migrate along the northern shore of Kotzebue Sound during the third week of August. With a reduced number of fishers and a concentration of their effort near town, the incidental catch of Dolly Varden was below average in 2000. There were 7 Dolly Varden sold with an average weight of 6.3 pounds. The commercial harvest has been as much as 7,700 but

averages around 2,000. Historically two-thirds of the catch is taken on the north side of the district near Sheshalik.

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, have ranged from 7,000 to 49,000 Dolly Varden annually (Appendix Table 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. It should be pointed out that the historical subsistence Dolly Varden catches that are summarized in Appendix Table F5 are very minimal figures due to the timing of the surveys conducted. Most Dolly Varden harvests take place prior to or just after freeze-up. The village of Noatak usually fishes prior to freeze-up, while the Kobuk River villages of Shungnak and Noorvik fish for Dolly Varden throughout the winter. In 2000 an estimated 3,315 Dolly Varden were harvested for subsistence by the community of Noatak (Georgette and Utermohle, 2001). This was lower than the estimated harvests for Noatak from 1995-98. There was no harvest data collected in 1999.

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 Table 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. No Dolly Varden survey were flown in the Kotzebue District in 2000.

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 the sole representatives of the genus *Prosopium* in this area. All species normally spawn in the 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, there has been increasing interest in commercial development of this resource, especially in the Kotzebue District.

Commercial Fishery

Limited commercial whitefish harvests have been allowed since statehood, normally under the auspices of a permit that delineated harvest levels, open areas, legal gear, etc. Commercial whitefish fisheries have generally been limited to large open water areas (e.g. Grantley Harbor in the Port Clarence District) or ocean waters. Beach seines have been stipulated as legal gear in some instances in order to reduce the number of incidental species taken. Little comparative commercial catch and effort data have been recorded, but harvest levels have historically been low. A majority of the commercial catches have been made in Golovin 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 have been 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, while 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 have been dried and consumed or stored in caches prior to 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 70,097 whitefish were harvested in 2000 for subsistence in the Noatak and Kobuk river villages (Appendix Table F7). This was a higher than the average harvest of the previous three years. Mean household harvests ranged from 26 whitefish in Noatak to 502 whitefish in Ambler (Georgette and Utermohle, 2001).

Escapement

Whitefish escapements have not been monitored in the past, but there have been no indications from limited department observations or fishers interviews of 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 as well as with gillnets in open water and dipping through the ice in Unalakleet.

There has never been an extensive commercial fishery on tomcod in the Norton Sound, Port Clarence or Kotzebue areas. During 1980, one fisher caught and sold 89 pounds (98 tomcod) in the Nome Subdistrict. There were no commercial landings 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 that had not been commercially utilized in the past. The need for crab bait was the primary factor in initiating 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 2000.

MISCELLANEOUS FINFISH SPECIES

Other finfish species taken for subsistence in the Norton Sound, Port Clarence, and Kotzebue area include: 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 to be 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.

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Table 1. Norton Sound commercial salmon harvest summary by subdistrict, 2000.

		Subdistricts						Total
		1	2	3	4	5	6	Number
Number of Fishers		0	12	13	0	26	49	79
Chinook	Number	0	0	10	0	160	582	752
	Weight(lbs.)	0	0	146	0	3,058	8,036	11,240
Sockeye	Number	0	0	0	0	3	11	14
	Weight(lbs.)	0	0	0	0	25	93	118
Coho	Number	0	1,645	5,182	0	7,779	29,803	44,409
	Weight(lbs.)	0	14,147	36,667	0	57,887	198,864	307,565
Pink	Number	0	17,408	46,369	0	85,493	17,278	166,548
	Weight(lbs.)	0	38,416	103,455	0	191,020	36,909	369,800
Chum	Number	0	164	535	0	2,751	2,700	6,150
	Weight(lbs.)	0	900	3,456	0	19,822	16,120	40,298
Totals	Number	0	19,217	52,096	0	96,186	50,374	217,873
	Weight(lbs.)	0	53,463	143,724	0	271,812	260,022	729,021

Table 2. Tier I subsistence salmon harvest by Nome area fishers, Norton Sound, 2000.

	Number of Permits			Number of Salmon Harvested					Total
	Issued	Returned	Fished	Chinook	Sockeye	Coho	Pink	Chum	
Marine Waters	33	26	10	0	33	69	379	57	538
Nome River	18	15	8	0	1	239	130	14	384
Snake River	2	1	1	0	0	8	6	0	14
Eldorado River	21	17	9	0	0	8	708	298	1,014
Flambeau River	5	2	2	0	3	193	0	0	196
Bonanza River	10	6	4	0	0	90	61	30	181
Safety Sound	4	2	1	0	0	0	0	0	0
Solomon River	5	4	2	0	0	0	92	0	92
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	1	1	0	0	7	86	0	93
Feather River	0	0	0	0	0	0	0	0	0
Fish River	0	0	0	0	0	0	0	0	0
Niukluk River	6	4	3	7	0	74	0	0	81
Port Clarence	0	0	0	0	0	0	0	0	0
Kuzitrin River	1	1	1	0	0	0	0	0	0
Pilgrim River	11	5	3	2	31	36	12	11	92
Unknown River	0	0	0	0	0	0	0	0	0
Total	117	84	45	9	68	724	1,474	410	2,685

Table 3. Tier II subsistence salmon harvest by Nome area fishers, Norton Sound, 2000.

	Number of Permits			Number of Salmon Harvested					Total
	Issued	Returned	Fished	Chinook	Sockeye	Coho	Pink	Chum	
Marine Waters	9	9	5	7	17	99	1,235	158	1,516
Nome River	0	0	0	0	0	0	0	0	0
Snake River	0	0	0	0	0	0	0	0	0
Eldorado River	0	0	0	0	0	0	0	0	0
Flambeau River	0	0	0	0	0	0	0	0	0
Bonanza River	0	0	0	0	0	0	0	0	0
Safety Sound	0	0	0	0	0	0	0	0	0
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
Unknown River	0	0	0	0	0	0	0	0	0
Total	9	9	5	7	17	99	1,235	158	1,516

Table 4. Salmon survey counts of Norton Sound streams and associated salmon BEG's, 2000.

Stream Name	Chinook	Chinook BEG Range	Chum	Chum BEG Range	Coho	Coho BEG Range	Sockeye	Sockeye BEG Range	Pink	Pink BEG
Salmon L.							6,341	Combined		
Grand Central R.							^b	4,000 - 8,000		
Pilgrim R.	5		741 ^a		69 ^a		242		1,942 ^a	
Glacial L.							1,446	800 - 1,600		
Sinuk R.			10 ^a	3,600 - 7,200	912 ^a		117		12,608 ^a	
Cripple R.					290				3,663	
Penny R.					192				715	
Snake R.			59 ^a	800 - 1,600	998 ^a		2		80 ^a	
Nome R.			658	1,600 - 3,200	1,032				6,380	13,000
Flambeau R.			819	Combined	11 ^a				640	
Eldorado R.			3,383	5,200 - 10,400	24 ^a				16,080	
Bonanza R.	2		1,130	1,000 - 1,900	715 ^a				12,410	
Solomon R.			150	300 - 550	70 ^a				2,899	
Fish R.		Combined	^b	Combined	805 ^a					
Boston Cr.		100 - 250	^b	23,200 - 46,400	414 ^a					
Niukluk R.			^b		3,812 ^a	Combined				8,400
Ophir Cr.					120 ^a	950 - 1,900				
Kwiniuk R.	114 ^c	300 - 550	12,251 ^c	15,600 - 31,200	541 ^a	650-1,300			618,017 ^c	12,500
Tubutulik R. ^b			^b	13,600 - 27,200	0 ^a					
Inglutalik R. ^b										
Ungalik R. ^b										
Shaktoolik R. ^b		400 - 800								48,000
Unalakeet R. ^b		Combined		Combined						
Old Woman R. ^b		550 - 1,100		2,400 - 4,800						
North R. ^b		250 - 500 ^d				550-1,100				8,500

Note: A multitude of factors affect escapement estimates. The numbers above are strict values which are instantaneous counts that alone do not fully represent the strength of the run. Chum goals are reviewed periodically and pertain to aerial surveys in all cases except for the Kwiniuk River which has a counting tower goal.

^a Counts should be considered minimums due to counting conditions.

^b No surveys due to counting conditions.

^c Minimum expanded tower counts.

^d Chinook salmon counting tower BEG range is 1,200 to 2,400.

Table 5. Commercial salmon set gillnet catches from Golovin, Subdistrict 2, Norton Sound, 2000

Period	Hrs. Fished	Date	# permits	Kings	Period Catch and Catch Per Unit Effort					Cumulative Catch and Catch Per Unit Effort									
					King CPUE	Chum	Chum CPUE	Pinks	Pink CPUE	Coho	Coho CPUE	Kings	King CPUE	Chum	Chum CPUE	Pinks	Pink CPUE	Coho	Coho CPUE
Pink 1	12	7/10	1			133	11.08	217	18.08					133	11.08	217	18.08		
Pink 2	6	7/13	6			12	0.33	5,262	146.17					145	3.02	5,479	114.15		
Pink 3	24	7/14	4			7	0.07	2,367	24.66					152	1.06	7,846	54.49		
Pink 4	24	7/15												152	1.06	7,846	54.49		
Pink 5	24	7/16	7			8	0.05	6,759	40.23					160	0.51	14,605	46.81		
Pink 6	24	7/17	2			3	0.06	2,803	58.40					163	0.45	17,408	48.36		
Pink 7	24	7/18												163	0.45	17,408	48.36		
Pink 8	24	7/19												163	0.45	17,408	48.36		
Pink 9	24	7/20												163	0.45	17,408	48.36		
Pink 10	24	7/21												163	0.45	17,408	48.36		
Pink 11	12	7/22												163	0.45	17,408	48.36		
Coho 1	48	8/07-8/09												163	0.45				
Coho 2	48	8/10-8/12	3							381	2.65			163	0.32			381	2.65
Coho 3	48	8/14-8/16	5			1	0.00			1,193	4.97			164	0.22			1,574	4.10
Coho 4	48	8/17-8/19												164	0.22			1,574	4.10
Coho 5	48	8/21-8/23												164	0.22			1,574	4.10
Coho 6	48	8/24-8/26	3							71	0.33			164	0.18			1,645	3.12
Coho 7	48	8/28-8/30												164	0.18			1,645	3.12

Total hours fished = 276

Total number of permits used = 12

65

Table 6. Commercial salmon set gillnet catches from Moses Point, Subdistrict 3, Norton Sound, 2000

Period	Hrs. Fished	Date	# permits	Period Catch and Catch Per Unit Effort						Cumulative Catch and Catch Per Unit Effort									
				Kings	King CPUE	Chum	Chum CPUE	Pinks	Pink CPUE	Coho	Coho CPUE	Kings	King CPUE	Chum	Chum CPUE	Pinks	Pink CPUE	Coho	Coho CPUE
Pink 1	12	7/05	5	2	0.03	143	2.38	5,895	98.25					143	2.38	5,895	98.25		
Pink 2	24	7/06	8	1	0.01	57	0.30	3,408	17.75			3		200	0.79	9,303	36.92		
Pink 3	24	7/07	7	1	0.01	83	0.49	7,566	45.04			4		283	0.67	16,869	40.16		
Pink 4	24	7/08	8	1	0.01	81	0.42	5,795	30.18			5		364	0.59	22,664	37.03		
Pink 5	24	7/09	7			12	0.07	4,504	26.81			5		376	0.48	27,168	34.83		
Pink 6	24	7/10										5		376	0.48	27,168	34.83		
Pink 7	24	7/11	6			9	0.06	5,098	35.40			5		385	0.42	32,266	34.92		
Pink 8	24	7/12	8	1	0.01			4,618	24.05			6		385	0.34	36,884	33.05		
Pink 9	24	7/13	10					3,483	14.51			6		385	0.28	40,367	29.77		
Pink 10	24	7/14										6		385	0.28	40,367	29.77		
Pink 11	24	7/15										6		385	0.28	40,367	29.77		
Pink 12	24	7/16										6		385	0.28	40,367	29.77		
Pink 13	24	7/17	4			82	0.85	3,830	39.90			6		467	0.32	44,197	30.44		
Pink 14	24	7/18	4			2	0.02	2,172	22.63			6		469	0.30	46,369	29.95		
Pink 15	24	7/19										6		469	0.30	46,369	29.95		
Pink 16	24	7/20										6		469	0.30	46,369	29.95		
Pink 17	24	7/21										6		469	0.30	46,369	29.95		
Pink 18	12	7/22										6		469	0.30	46,369	29.95		
Coho 1	48	8/07-8/09	5			4	0.02			1,263	5.26	6		473	0.26	46,369		1,263	5.26
Coho 2	48	8/10-8/12	4			8	0.04			495	2.58	6		481	0.24	46,369		1,758	4.07
Coho 3	48	8/14-8/16	7			14	0.04			852	2.54	6		495	0.21	46,369		2,610	3.40
Coho 4	48	8/17-8/19	7			9	0.03			996	2.96	6		504	0.19	46,369		3,606	3.27
Coho 5	48	8/21-8/23	6	3	0.01	22	0.08			754	2.62	9		526	0.18	46,369		4,360	3.13
Coho 6	48	8/24-8/26	8	1	0.00	9	0.02			822	2.14	10		535	0.16	46,369		5,182	2.92
Coho 7	48	8/28-8/30										10		535	0.16	46,369		5,182	2.92

Total hours fished =552

Total number of permits used = 13

Table 7. Commercial salmon set gillnet catches from Shaktoolik, Subdistrict 5, Norton Sound, 2000.

Period	Hrs. Fished	Date	# permits	Period Catch and Catch Per Unit Effort						Cumulative Catch and Catch Per Unit Effort									
				Kings	King CPUE	Chum	Chum CPUE	Pinks	Pink CPUE	Coho	Coho CPUE	Kings	King CPUE	Chum	Chum CPUE	Pinks	Pink CPUE	Coho	Coho CPUE
King 1	24	6/22-6/23	11	77	0.29	147	0.56					77	0.29	147	0.56				
King 2	24	6/26-6/27	11	60	0.23	229	0.87					137	0.26	376	0.71				
Pink 1	12	7/2	15	11	0.06	243	0.06	12,447	0.06			148		619	0.87	12,447	69.15		
Pink 2	24	7/3										148		619	0.87	12,447	69.15		
Pink 3	24	7/4	10	3	0.01	207	0.86	6,971	29.05			151		826	0.87	19,418	46.23		
Pink 4	24	7/5	13	1	0.00	272	0.87	12,109	38.81			152		1,098	0.87	31,527	43.07		
Pink 5	24	7/6	11	2	0.01	205	0.78	7,470	28.30			154		1,303	0.85	38,997	39.15		
Pink 6	24	7/7	13			226	0.72	13,739	44.04			154		1,529	0.83	52,736	40.32		
Pink 7	24	7/8	11			144	0.55	4,961	18.79			154		1,673	0.80	57,697	36.70		
Pink 8	24	7/9	9			148	0.69	4,812	22.28			154		1,821	0.79	62,509	34.96		
Pink 9	24	7/10	13	2	0.01	153	0.49	7,819	25.06			156		1,974	0.75	70,328	33.49		
Pink 10	24	7/11	8			17	0.09	5,715	29.77			156		1,991	0.71	76,043	33.18		
Pink 11	24	7/12	11	2	0.01	13	0.05	4,310	16.33			158		2,004	0.65	80,353	31.44		
Pink 12	24	7/13	6	1	0.01			1,375	9.55			159		2,004	0.62	81,728	30.27		
Pink 13	24	7/14										159		2,004	0.62	81,728	30.27		
Pink 14	24	7/15										159		2,004	0.62	81,728	30.27		
Pink 15	24	7/16	2			1	0.02	651	13.56			159		2,005	0.61	82,379	29.98		
Pink 16	24	7/17	4			4	0.04	1,326	13.81			159		2,009	0.60	83,705	29.43		
Pink 17	24	7/18	4			20	0.21	1,503	15.66			159		2,029	0.59	85,208	28.98		
Pink 18	24	7/19	1					285	11.88			159		2,029	0.58	85,493	28.84		
Pink 19	24	7/20										159		2,029	0.58	85,493	28.84		
Pink 20	24	7/21										159		2,029	0.58	85,493	28.84		
Pink 21	12	7/22										159		2,029	0.58	85,493	28.84		
Coho 1	24	7/24-7/25	9	1	0.00	189	0.88			127	0.59	160		2,218	0.60	85,493		127	0.59
Coho 2	24	7/27-7/28	10			183	0.76			211	0.88	160		2,401	0.61	85,493		338	0.74
Coho 3	48	7/31-8/02	6			38	0.13			496	1.72	160		2,439	0.58	85,493		834	1.12
Coho 4	48	8/03-8/05	5			77	0.32			1,093	4.55	160		2,516	0.56	85,493		1927	1.96
Coho 5	48	8/07-8/09	15			63	0.09			2,121	2.95	160		2,579	0.50	85,493		4048	2.38
Coho 6	48	8/10-8/12	10			120	0.25			1,051	2.19	160		2,699	0.48	85,493		5099	2.33
Coho 7	48	8/14-8/16	13			26	0.04			1,467	2.35	160		2,725	0.43	85,493		6566	2.34
Coho 8	48	8/17-8/19	7			21	0.06			707	2.10	160		2,746	0.41	85,493		7273	2.31
Coho 9	48	8/21-8/23	9			3	0.01			429	0.99	160		2,749	0.39	85,493		7702	2.15
Coho 10	48	8/24-8/26	3			2	0.01			77	0.53	160		2,751	0.38	85,493		7779	2.09
Coho 11	48	8/28-8/30										160		2,751	0.38	85,493		7779	2.09

Total hours fished =636

Total number of permits used = 26

Table 8. Commercial salmon set gillnet catches from Unalakleet, Subdistrict 6, Norton Sound, 2000.

Period	Hrs. Fished	Date	# permits	Period Catch and Catch Per Unit Effort							Cumulative Catch and Catch Per Unit Effort								
				Kings	King CPUE	Chum	Chum CPUE	Pinks	Pink CPUE	Coho	Coho CPUE	Kings	King CPUE	Chum	Chum CPUE	Pinks	Pink CPUE	Coho	Coho CPUE
King 1	24	6/22-6/23	27	214	0.33	246	0.38	0	0.00			214	0.33	1	0.00				
King 2	24	6/26-6/27	24	311	0.54	471	0.82	0	0.00			525	0.43	717	0.59				
Pink 1	12	7/2	1					251	20.92			525		717	0.58	251	20.92		
Pink 2	24	7/3	7	9	0.05	596	3.55	4,166	24.80			534		1,313	0.94	4,417	24.54		
Pink 3	24	7/4										534		1,313	0.94	4,417	24.54		
Pink 4	24	7/5	5	4	0.03	39	0.33	1,860	15.50			538		1,352	0.89	6,277	20.92		
Pink 5	24	7/6	6	24	0.17	12	0.08	4,559	31.66			562		1,364	0.82	10,836	24.41		
Pink 6	24	7/7	6	4	0.03		0.00	4,102	28.49			566		1,364	0.75	14,938	25.40		
Pink 7	24	7/8	2	2	0.04	5	0.10	627	13.06			568		1,369	0.74	15,565	24.47		
Pink 8	24	7/9	5	4	0.03	53	0.44	1,622	13.52			572		1,422	0.72	17,187	22.73		
Pink 9	24	7/10										572		1,422	0.72	17,187	22.73		
Pink 10	24	7/11										572		1,422	0.72	17,187	22.73		
Pink 11	24	7/12										572		1,422	0.72	17,187	22.73		
Pink 12	24	7/13										572		1,422	0.72	17,187	22.73		
Pink 13	24	7/14										572		1,422	0.72	17,187	22.73		
Pink 14	24	7/15	1			21	0.88	90	3.75			572		1,443	0.72	17,277	22.15		
Pink 15	24	7/16										572		1,443	0.72	17,277	22.15		
Pink 16	24	7/17										572		1,443	0.72	17,277	22.15		
Pink 17	24	7/18										572		1,443	0.72	17,277	22.15		
Pink 18	24	7/19										572		1,443	0.72	17,277	22.15		
Pink 19	24	7/20										572		1,443	0.72	17,277	22.15		
Pink 20	24	7/21										572		1,443	0.72	17,277	22.15		
Pink 21	12	7/22										572		1,443	0.72	17,277	22.15		
Coho 1	24	7/24-7/25	4	1	0.01	245	2.55			265	2.76	573		1,688	0.80	17,277		265	2.76
Coho 2	24	7/27-7/28	7	1	0.01	150	0.89			359	2.14	574		1,838	0.81	17,277		624	2.36
Coho 3	48	7/31-8/2	14	1	0.00	140	0.21			1,927	2.87	575		1,978	0.67	17,277		2,551	2.73
Coho 4	48	8/3-8/5	11			195	0.37			5,784	10.95	575		2,173	0.63	17,277		8,335	5.69
Coho 5	48	8/7-8/9	29	3	0.00	175	0.13			9,809	7.05	578		2,348	0.48	17,277		18,144	6.35
Coho 6	48	8/10-8/12	18	2	0.00	160	0.19	1		4,995	5.78	580		2,508	0.44	17,278		23,139	6.22
Coho 7	48	8/14-8/16	28	2	0.00	56	0.04			1,816	1.35	582		2,564	0.36	17,278		24,955	4.93
Coho 8	48	8/17-8/19	19			54	0.06			2,274	2.49	582		2,618	0.33	17,278		27,229	4.56
Coho 9	48	8/21-8/23	16			52	0.07			1,490	1.94	582		2,670	0.31	17,278		28,719	4.26
Coho 10	48	8/24-8/26	14			23	0.03			612	0.91	582		2,693	0.29	17,278		29,331	3.96
Coho 11	48	8/28-8/30	6			7	0.02			472	1.64	582		2,700	0.28	17,278		29,803	3.87

Total hours fished = 732
 Total number of permits used = 49

Table 9. Norton Sound area subsistence salmon harvests, 2000.

	Chinook		Chum		Pink		Sockeye		Coho		Total			
	Total HH's	HH's Contacted	Reported Harvest	Est. ^a Total										
Norne Permits ^b	107	82	7	7	535	535	2,657	2,657	26	26	747	747	3,972	3,972
Subdistrict 1	107	82	7	7	535	535	2,657	2,657	26	26	747	747	3,972	3,972
Golovin	45	42	41	42	839	866	4,158	4,306	17	18	1,287	1,328	6,342	6,560
Niukluk R. Permits ^b	7	4	7	7	0	0	0	0	0	0	74	74	81	81
White Mountain	67	65	116	120	280	289	6,381	660	0	0	902	932	7,679	7,941
Subdistrict 2	119	111	164	169	1,119	1,155	10,539	10,906	17	18	2,263	2,335	14,102	14,583
Elim	84	76	226	248	1,068	1,173	5,444	5,983	42	46	1,300	1,429	8,080	8,879
Subdistrict 3	84	76	226	248	1,068	1,173	5,444	5,983	42	46	1,300	1,429	8,080	8,879
Koyuk	75	67	348	397	4,135	4,714	1,978	2,255	2	2	234	267	6,697	7,635
Subdistrict 4	75	67	348	397	4,135	4,714	1,978	2,255	2	2	234	267	6,697	7,635
Shaktoolik	56	54	431	440	2,361	2,412	5,316	5,432	20	20	2,738	2,799	10,866	11,103
Subdistrict 5	56	54	431	440	2,361	2,412	5,316	5,432	20	20	2,738	2,799	10,866	11,103
Unalakleet ^c	206	177	2,112	2,429	2,182	3,000	9,161	10,631	188	212	5,028	5,878	18,671	22,150
Subdistrict 6	206	177	2,112	2,429	2,182	3,000	9,161	10,631	188	212	5,028	5,878	18,671	22,150
Stebbins	128	110	257	298	2,510	2,913	314	364	294	341	2,093	2,429	5,468	6,345
St. Michael	85	80	148	160	1,276	1,381	74	80	15	16	1,091	1,180	2,604	2,818
South Norton Sound	213	190	405	458	3,786	4,294	388	444	309	357	3,184	3,609	8,072	9,163
NORTON SOUND	860	757	3,693	4,149	15,186	17,283	35,483	38,308	604	682	15,494	17,062	70,460	77,485

^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. SOURCE: Alaska Department of Fish and Game, Division of Subsistence, household surveys, 2000.

^b Alaska Department of Fish and Game, Division of Commercial Fisheries, permit returns, 2000. Data not expanded.

^c Estimated salmon harvest in Unalakleet includes 45 chinook, 535 chum, 292 pink, and 183 coho from the ADF&G test net fishery in addition to the survey results.

Table 10. Subsistence salmon harvests, Port Clarence District, 2000.

	Chinook		Chum		Pink		Sockeye		Coho		Total			
	Total HH's	HH's Contacted	Reported Harvest	Est. ^a Total										
Brevig Mission	69	57	27	32	413	486	680	808	850	1,007	443	530	2,413	2,863
Pilgrim R. Permits ^o	15	8	2	2	43	43	22	22	61	61	36	36	164	164
Teller	79	69	33	39	640	747	477	557	1,530	1,784	316	369	2,996	3,494
PORT CLARENCE	163	134	62	72	1,096	1,275	1,179	1,387	2,441	2,851	795	935	5,573	6,521

^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.

^o Alaska Department of Fish and Game, Division of Commercial Fisheries, permit returns, 2000. Data not expanded.

SOURCE: Alaska Department of Fish and Game, Division of Subsistence, household surveys, 2000.

Table 11. Commercial catches of chum salmon, chinook salmon, and Dolly Varden by period in the Kotzebue District, 2000.

Period	Date	Hours Fished	Number of Fishermen	Catch Rate (chum)	Chum			Chinook			Dolly Varden		
					Number	Pounds	Avg. Wt.	Number	Pounds	Avg. Wt.	Number	Pounds	Avg. Wt.
1	10-Jul-00	12	0	0.0	0	0	0.0	0	0	0.0			
2	11-Jul-00	12	1	10.9	131	1,161	8.9						
3	13-Jul-00	12	4	12.8	614	5,256	8.6						
4	14-Jul-00	12	4	23.6	1,134	9,886	8.7						
5	17-Jul-00	12	15	41.2	7,407	63,713	8.6						
6	18-Jul-00	12	20	42.1	10,101	91,201	9.0						
7	20-Jul-00	12	25	21.2	6,357	56,522	8.9						
8	21-Jul-00	12	30	31.7	11,422	101,399	8.9						
9	24-Jul-00	12	0					1	24	24.0			
10	25-Jan-00	12	31	29.8	11,084	97,296	8.8						
11	26-Jul-00	12	11	19.3	2,543	22,118	8.7						
12	27-Jul-00	12	23	31.9	8,798	77,014	8.8						
13	28-Jul-00	12	26	16.5	5,141	44,961	8.7						
14	1-Aug-00	12	24	12.4	3,582	31,523	8.8						
15	2-Aug-00	12	30	21.0	7,551	67,713	9.0						
16	3-Aug-00	12	33	35.6	14,102	121,903	8.6						
17	4-Aug-00	12	24	25.2	7,269	61,635	8.5						
18	8-Aug-00	12	42	30.3	15,254	130,739	8.6						
19	9-Aug-00	12	35	27.7	11,648	97,440	8.4	1	9	9.0			
20	10-Aug-00	12	35	26.3	11,058	91,562	8.3						
21	11-Aug-00	12	30	19.7	7,103	57,824	8.1						
22	15-Aug-00	12	22	10.2	2,698	21,463	8.0				7	44	6.3
23	16-Aug-00	12	17	11.1	2,273	18,146	8.0						
24	17-Aug-00	12	25	10.6	3,184	25,380	8.0						
25	18-Aug-00	12	20	17.9	4,305	34,781	8.1	1	29	29.0			
26	22-Aug-00	12	14	12.0	2,010	16,178	8.0						
27	23-Aug-00	12	14	9.5	1,588	12,491	7.9						
28	24-Aug-00	12	11	10.9	1,445	11,332	7.8						
29													
30													
Totals		336	64		159,802	1,370,637	8.6	3	62	20.7	7	44	6.3

Table 12. Historical average age composition by period for the recent 21 years (1979-1999) and 2000.

21 Year Average		Percent				Catch by Age			
Period	Catch	3	4	5	6	3	4	5	6
1	2,896	0.4	35.1	58.8	6.3	12	1,017	1,703	182
2	4,934	0.8	40.5	52.5	5.7	39	1,998	2,590	281
3	9,189	1.3	42.0	50.5	6.2	119	3,859	4,641	570
4	16,242	1.2	50.4	44.2	4.4	195	8,186	7,179	715
5	20,472	1.2	48.5	44.5	5.4	246	9,929	9,110	1,106
6	26,824	1.8	54.5	40.2	3.4	483	14,619	10,783	912
7	32,549	2.7	58.2	36.2	3.0	879	18,943	11,783	976
8	34,889	3.9	60.8	32.0	2.8	1,361	21,213	11,165	977
9	34,182	5.0	61.0	31.4	2.9	1,709	20,851	10,733	991
10	37,818	5.6	63.1	29.5	1.9	2,118	23,863	11,156	719
11	22,472	10.2	64.8	22.9	1.5	2,292	14,562	5,146	337
12	13,294	11.2	60.7	25.7	2.1	1,489	8,069	3,416	279
13	9,222	9.6	62.8	25.4	2.2	885	5,791	2,342	203
14	6,584	9.1	62.3	27.2	1.3	599	4,102	1,791	86
15	2,876	5.1	66.0	27.1	1.5	147	1,898	779	43

Kotzebue Sound commercial catch and age composition, 2000.

		Percent				Catch by Age			
Period	Catch	3	4	5	6	3	4	5	6
1	131	0.0	38.8	61.2		0	51	80	0
2	1,748	0.0	41.9	57.2	0.8	0	732	1,000	14
3	17,508	0.0	55.1	44.9		0	9,647	7,861	0
4	17,779	0.4	51.8	46.1	1.6	71	9,210	8,196	284
5	13,627	0.0	61.9	36.8	1.3	0	8,435	5,015	177
6	13,939	0.4	63.3	34.7	1.6	56	8,823	4,837	223
7	11,133	0.8	68.1	30.3	0.8	89	7,582	3,373	89
8	21,371	3.6	64.0	30.8	1.6	769	13,677	6,582	342
9	26,902	1.8	61.8	36.4		484	16,625	9,792	0
10	18,161	3.2	67.6	27.6	1.6	581	12,277	5,012	291
11	4,971	8.3	71.5	19.4	0.7	413	3,554	964	35
12	7,489	8.2	74.5	16.5	0.8	614	5,579	1,236	60
13	3,598	9.2	68.4	21.4	1.0	331	2,461	770	36
14	1,445	15.8	68.8	16.9	1.5	228	994	244	22
15									

Table 13. Kobuk River chum salmon drift test fishing mean daily and cumulative CPUE, 1993-2000.

Date	1993		1994		1995		1996		1997		1998		1999		2000	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
7-Jul															1.28	1.28
8-Jul															0.83	2.11
9-Jul															0	2.11
10-Jul							15	27.77	0	5.85	5.22	5.22			2.5	4.61
11-Jul							98.38	126.15	5.31	11.16	0.85	6.07	0	0	3.44	8.05
12-Jul	11.18	11.18			0	0	45.54	171.69	7.19	18.35	a	6.07	0	0	3.45	11.50
13-Jul	14.22	25.4	0	0	0.93	0.93	74.29	245.98	a	18.35	15.89	21.96	0	0	2.54	14.04
14-Jul	20.57	45.97	2.68	2.68	2.80	3.73	a	245.98	6.25	24.60	7.53	29.49	0	0	8.57	22.61
15-Jul	35.08	81.05	2.58	5.26	2.77	6.5	83.75	329.73	3.65	28.25	14.07	43.56	0	0	0.87	23.48
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	0	3.38	26.86
17-Jul	17.27	111.51	a	16.61	0	6.50	55.49	456.57	15.17	57.7	5.07	65.96	4.26	4.26	12.77	39.63
18-Jul	a	111.51	7.16	23.77	1.81	8.31	89.86	546.43	16.12	73.82	9.02	74.98	8.48	12.74	3.58	43.21
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
20-Jul	2.76	124.98	3.65	39.82	16.3	34.50	63.7	664.87	a	91.8	18.66	93.64	5.11	23.74	14.57	77.29
21-Jul	3.2	128.18	7.30	47.12	38.54	73.04	52.12	716.99	18.53	110.33	11.87	105.51	23.75	47.49	27.69	104.98
22-Jul	5.52	133.7	3.56	50.68	21.18	94.22	50.97	767.96	13.28	123.61	0	105.51	11.91	59.40	41.00	145.98
23-Jul	27.15	160.85	16.49	67.17	50.58	144.8	91.36	859.32	10.79	134.4	29.58	135.09	6.09	65.49	16.29	162.27
24-Jul	9.06	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
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
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
27-Jul	8.06	193.19	40.66	169.86	63.94	312.51	29.79	1,113.48	18.46	211.95	23.91	211.01	80.39	239.28	41.52	281.67
28-Jul	16.36	209.55	57.83	227.69	62.49	375.00	49.06	1,162.54	30.53	242.48	51.91	262.92		239.28	62.34	344.01
29-Jul	0.93	210.48	33.62	261.31	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
30-Jul	0.92	211.4	69.21	330.52	57.86	478.97	35.29	1,267.96	22.33	292.94	24.59	321.67	49.66	343.94	138.20	578.21
31-Jul	12.58	223.98	a	330.52	29.89	508.86	82.27	1,350.23	32.57	325.51	15.69	337.36	160.53	504.47	85.87	664.08
1-Aug	a	223.98	82.16	412.68	72.91	581.77	167.67	1,517.90	41.41	366.92	25.44	362.8	145.02	649.49	101.16	765.24
2-Aug	6.74	230.72	65.12	477.80	48.71	630.48	62.02	1,579.92	22.41	389.33	a	362.8	41.67	691.16	64.37	829.61
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
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
5-Aug	89.3	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
6-Aug	18.6	437.34	102.56	820.87	a	781.83	80.47	1,835.35	42.25	517.93	6.00	446.39	82.79	989.41	38.92	1,057.25
7-Aug	20.52	457.86	a	820.87	46.39	828.22	90.99	1,926.34	36.00	553.93	5.11	451.50	82.73	1,072.14	37.50	1,094.75
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
9-Aug	1.84	459.7	96.86	980.48	68.22	940.46	106.11	2,179.39	55.14	654.14	17.20	485.10	55.58	1,127.72	81.50	1,269.62
10-Aug	12.63	472.33	45.83	1,026.31	56.33	996.79	56.95	2,236.34	a	654.14	9.46	494.56	44.73	1,172.45	113.87	1,383.49
11-Aug	18.11	490.44	57.02	1,083.33	37.95	1,034.74	a	2,236.34	43.45	697.59	10.29	504.85	58.13	1,230.58	50.57	1,434.06
12-Aug	3.74	494.18	90.54	1,173.87	63.92	1,098.66	72.29	2,308.63	37.36	734.95	19.44	524.29	48.50	1,279.08	24.86	1,458.92
13-Aug			11.36	1,185.23	a	1,098.66	114.63	2,423.26	45.93	780.88	10.21	534.50	78.37	1,357.45	14.57	1,473.49
14-Aug			a	1,185.23	29.35	1,128.01	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	538.35				
16-Aug			16.23	1,206.59	35.04	1,188.31										

^a Regular day off

Table 14. Subsistence salmon harvests, Kotzebue Sound, 2000.

	Chinook		Chum		Pink		Sockeye		Coho		Total	
	Total HH's	HH's Contacted	Reported Harvest	Est. ^a Total								
Ambler	70	34	0	0	2,620	5,009	0	0	0	0	2,620	5,009
Kiana ^b	88	51	0	0	567	2,876	0	0	45	74	677	3,057
Kobuk	30	15	0	0	318	318	0	0	0	0	318	318
Kotzebue ^c	779	185	49	206	8,821	37,144	0	0	0	0	152	640
Noatak	102	61	0	0	4,456	7,293	2	3	1	2	53	87
Noorvik	112	42	2	5	4,375	10,391	30	71	0	0	725	1,722
Shungnak	46	34	0	0	2,208	2,944	0	0	0	0	1	1
KOTZEBUE SOUND	1,227	422	51	211	23,365	65,975	32	75	46	75	996	2,557

^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. SOURCE: Alaska Department of Fish and Game, Division of Subsistence, household surveys, 2000.

^b Estimated chum salmon harvest in Kiana includes 1,932 chum from the ADF&G test net fishery in addition to the survey results.

^c Alaska Department of Fish and Game, Division of Subsistence, postcard survey, 2000.

Table 15. Daily observed peak biomass estimates of Pacific herring, Norton Sound District, 2000.

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	
5/22/00	1	FB	2.0	ice	0	0.0	0.0	0.0	0.0	0.0	0.0				0.0
5/26/00	2	FB	1.8	ice	0	0.0	0.0	0.0	0.0	0.0	0.0				0.0
5/29/00	3	FB	2.0	ice	0	0.0	0.0	0.0	0.0	0.0					0.0
6/1/00	4	FB	2.3	4	0	0.0	0.0	0.0	0.0	0.0					0.0
6/3/00	5	FB	3.0	4	0	0.0	3.0	0.0	211.6	0.0					214.6
6/4/00	6	FB	1.8	4	0	0.0	18.1	4.6	544.2						566.9
6/5/00	7	FB	2.0	4	27	5.2	899.0	46.4	1289.6						2235.0
6/6/00	8	FB	2.5	4	66	3.8	2144.2	299.7	5081.0						7524.9
6/7/00	9	FB	1.9	4	28	1.8	2731.3	404.4	2903.6						6039.3
6/8/00	10	FB/DB	2.8	4	20	0.7	2809.7	1385.3	6647.5						10842.5
6/9/00	11	FB	1.2	4					5676.7						5676.7
6/9/00	12	FB/DB	2.6	4	58	3.3	4535.3	678.4	1962.3						7176.0
6/11/00	13	DB	4.0	5	29	1.5	1163.5	1224.1	1329.9	0.0	0.0				3717.5
6/12/00	14	FB	4.1	4	98	4.0	2062.5	6427.0	8917.5	151.0	137.5	359.5	139.5		18194.5
6/13/00	15	FB	2.8	3	51	2.5	3501.6	15741.5	8162.5						27405.6
6/14/00	16	FB	2.8	3	28	2.2	5491.4	4300.1	14049.9						23841.4
Sum			39.6	3	405	25.0			Waste = 15 tons	Harvest=	4471.6	Total Harvest =	4486.7		
							3501.6	15741.5	8162.5	151.0	137.5	359.5	139.5		
														Survey	28193.1
														Biomass	32679.8
														% Exploitation	13.729%

Biomass includes combined Total Harvest, Waste, and Peak Survey Estimate.

Table 16. Norton Sound herring spawn estimates by subdistrict (s.d.), 2000.

Date	s.d. 1		s.d. 2		s.d. 3		s.d. 4		s.d. 5		s.d. 6		s.d. 7		Totals	
	#	Miles														
5/22	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5/25	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5/29	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5/25	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6/1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6/3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6/4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6/5	27	5.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	27	5.2
6/6	58	3.6	0	0.0	8	0.2	0	0.0	0	0.0	0	0.0	0	0.0	66	3.8
6/7	28	1.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	28	1.8
6/8	20	0.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	20	0.7
6/9	58	3.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	58	3.3
6/11	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
6/12	66	2.9	0	0.0	2	0.3	5	0.1	23	0.6	2	0.0	0	0.0	98	3.9
6/13	26	2.1	0	0.0	2	0.1	0	0.0	0	0.0	0	0.0	0	0.0	28	2.2
	283	19.6	0	0.0	12	0.6	5	0.1	23	0.6	2	0.0	0	0.0	325	20.9

Table 17. Gillnet and beach seine herring harvest and effort by date and subdistrict, Norton Sound District, 2000.

Date	<u>Subdistrict 1 (333-70) gillnet</u>			<u>Subdistrict 2 (333-72) beach seine</u>			<u>Subdistrict 3 (333-74) gillnet</u>			<u>Combined Totals</u>		
	Number Fishermen	Daily Catch (st)	Daily Roe %	Number Fishermen	Daily Catch (st)	Daily Roe %	Number Fishermen	Daily Catch (st)	Daily Roe %	Number Fishermen	Daily Catch (st)	Daily Roe %
6/7	38	281.8	8.2							38	281.8	
6/8				1	45.1	8.1						
6/9	29	165.4	9.4	2	28.9	11.4	53	481.9	8.7	83	692.4	
6/10	37	180.0	9.5				40	519.5	9.8	77	699.5	
6/11	52	521.3	9.1				29	263.4	9.7	81	784.7	
6/12	44	482.7	9.6				19	97.6	9.8	63	580.3	
6/13	40	361.8	10.4				30	166.9	9.8	70	528.7	
6/14	35	364.8	9.8				20	77.2	9.5	57	470.9	
6/15	5	26.9	10.9									
Total ^a	61	2,623.2	9.5	3	81.4	9.4	61	1,767.2	9.4	94	4471.72	9.5

^a 10% added to sac roe total due to dewatering by buyers.

Table 18. Norton Sound commercial herring harvest by statistical area, by gear type, 2000.

Stat Area	Location	Gillnet				Beach Seine				Spawn On Kelp	
		Sac Roe (st)	Avg. Roe %	Bait (st)	# fishers	Sac Roe (st)	Avg. Roe %	Bait (st)	# fishers	Pounds of Kelp	# fishers
333-70	Canal Point-Spruce Creek	2,384.7	9.5	0	61					4,500.0 ^a	3
333-72	Spruce Creek-Junction Creek					74	9.4	0	3		
333-74	Junction Creek-Island Point	1,606.5	9.4	0	61						
Totals		4,390.4 ^b	9.4	0.0	91	81.4 ^b	9.4	0	3	4,500.0	3

^a *Macrocystis* kelp.

^b 10% added to sac roe total due to dewatering by buyers.

Table 19. 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 3 Gillnetters Combined Total	56.4 st @7.6% 23.6 st @8.9% 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 Fall Bait	8 Permits (G/N) 2 Permits (G/N) Combined Total	19,193 lbs 9,119 lbs 28,312 lbs	\$.61/lb \$.37/lb \$.53/lb	\$ 11,625 \$ 3,393 \$ 15,018
1996	Spring Bait	4 Permits	5,546 lbs	\$.40/lb	\$ 2,218

Table 20. Commercial harvest of red king crab from Norton Sound Section by statistical area, Norton Sound District, 2000 (summer fishery only).

Statistical Area	Number	Pounds	Pots Pulled	CPUE	Average Weight (Lbs.)
616331	1,567	4,557	203	7.7	2.91
626401	1,713	4,689	143	12.0	2.74
636401	45,967	126,994	3,191	14.4	2.76
656401	34,589	94,813	1,640	21.1	2.74
666330	2,140	5,839	120	17.8	2.73
666401	22,273	60,762	824	27.0	2.73
Total	108,249	297,654	6,121	17.7	2.75

Table 21. Winter 1999-2000 subsistence red king crab catches and effort by gear type, Norton Sound area.

Gear Type	# Permits Fished ^a	# Males Caught	# Males Kept	# Females Caught	# Females Kept	Total Crab Captured	Total Crab Kept	Average Harvest per Fisher
Pots	53	9,048	5,746	778	12	9,826	5,758	109
Handlines	2	50	45	1	0	51	45	23
Both	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0
Totals	55	9,098	5,791	779	12	9,877	5,803	106

Number of Permits issued= 98

Number of Permits returned= 65

^a Some fishers use both handlines and pots to harvest crab

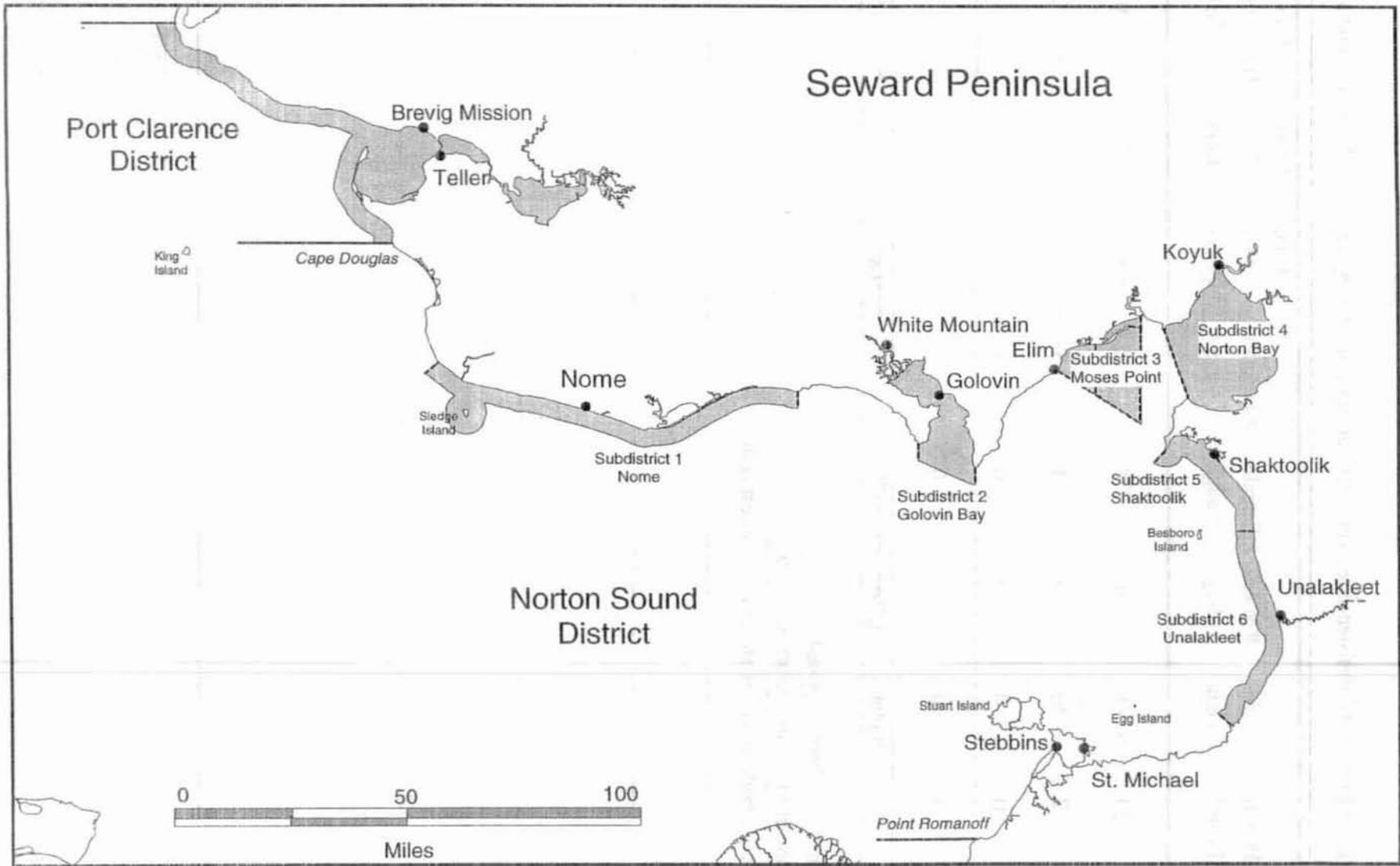


Figure 1. The commercial salmon fishing districts and subdistricts of Norton Sound and Port Clarence.

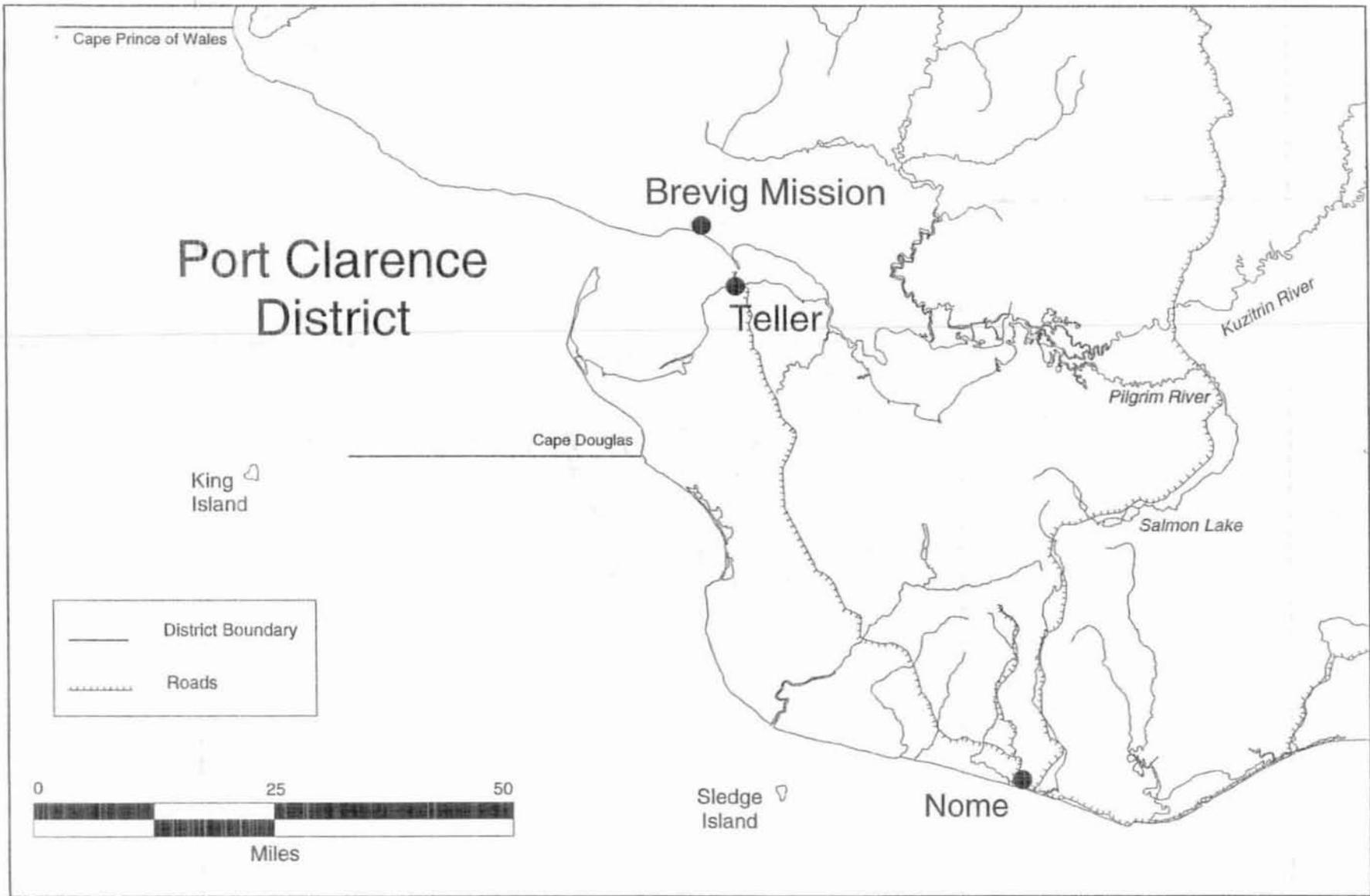


Figure 2. Port Clarence Salmon District.

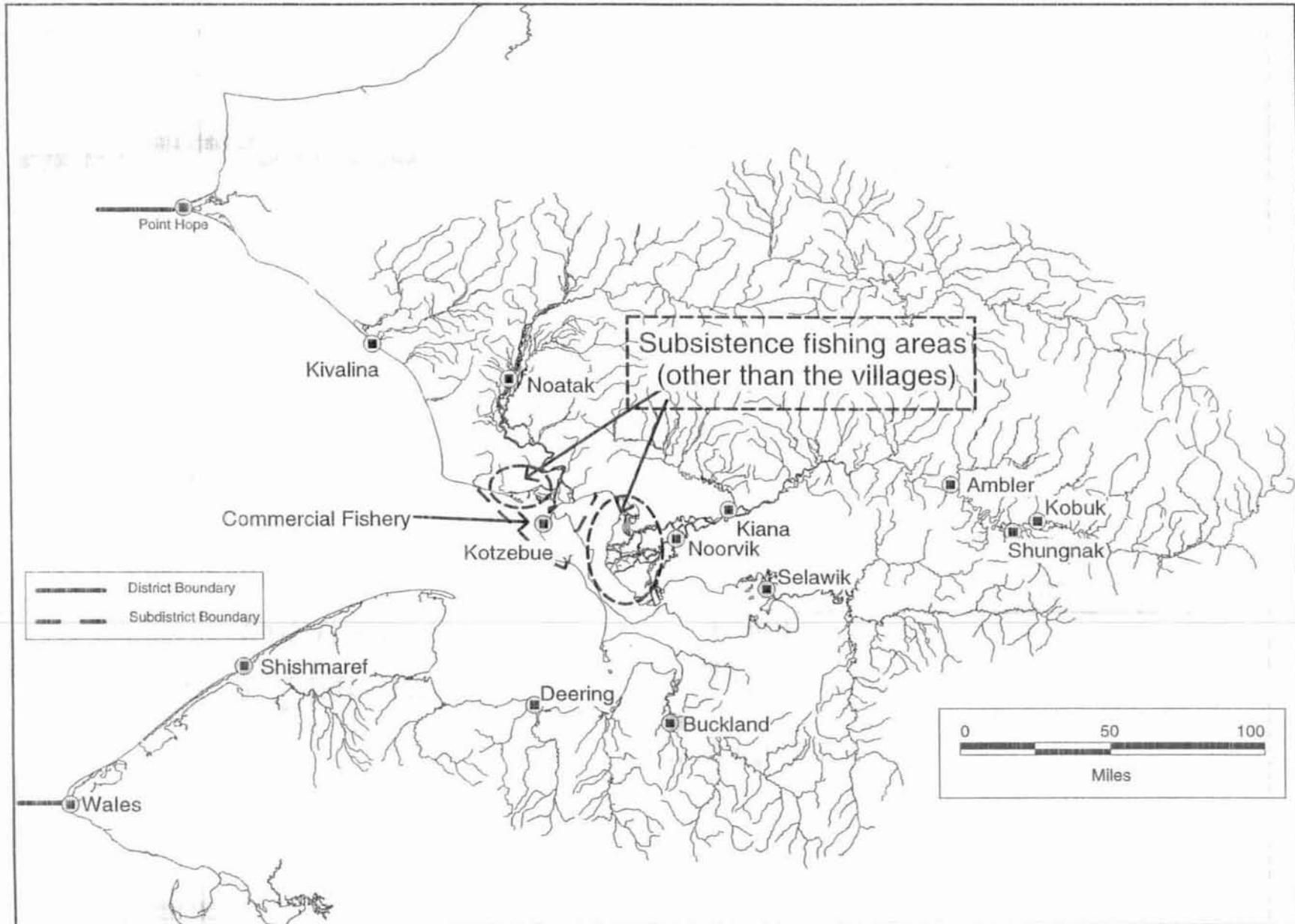


Figure 3. Kotzebue Sound salmon district, villages and subsistence fishing areas.

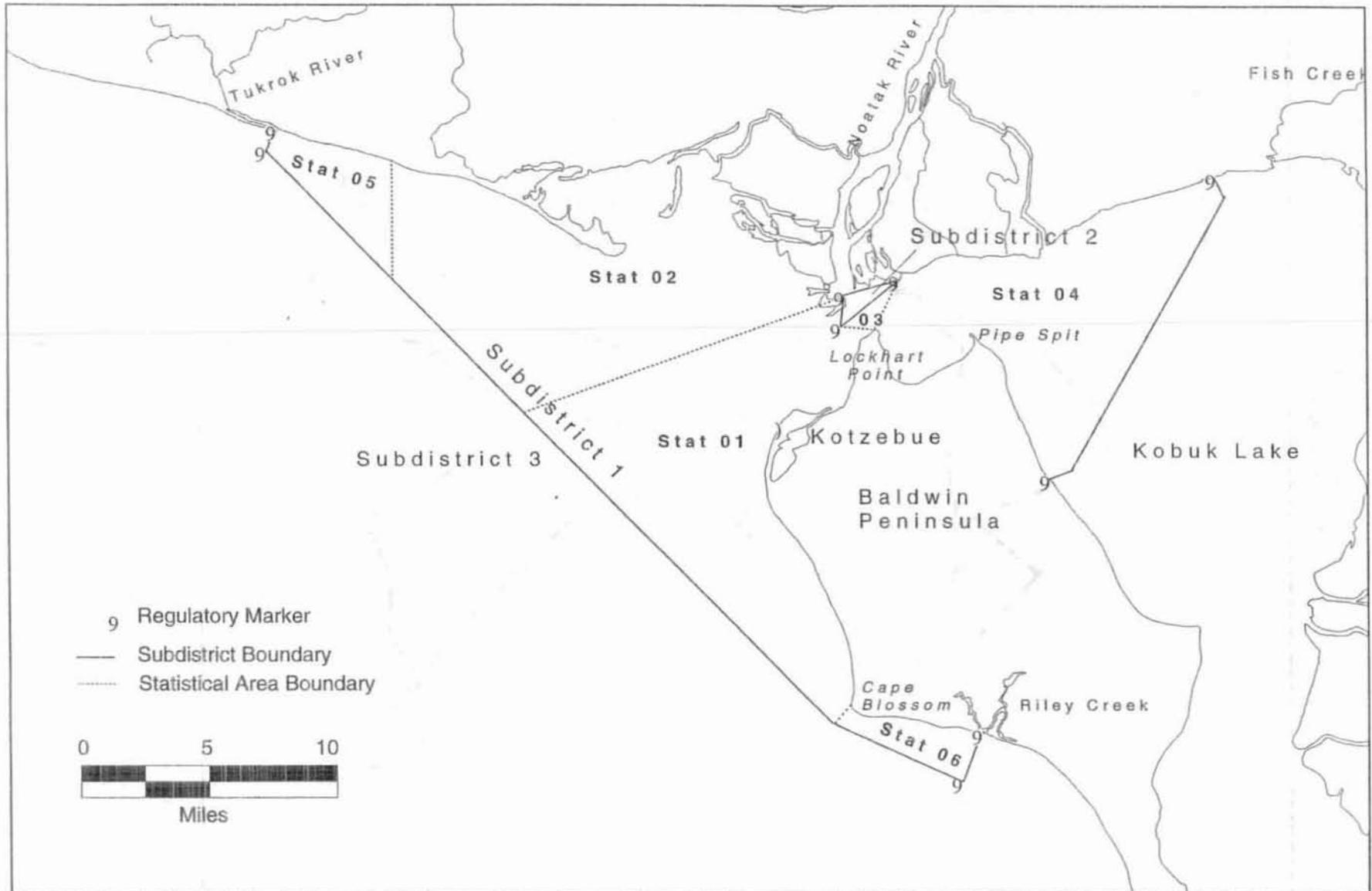


Figure 4. Kotzebue Sound salmon fishing subdistricts and statistical areas.

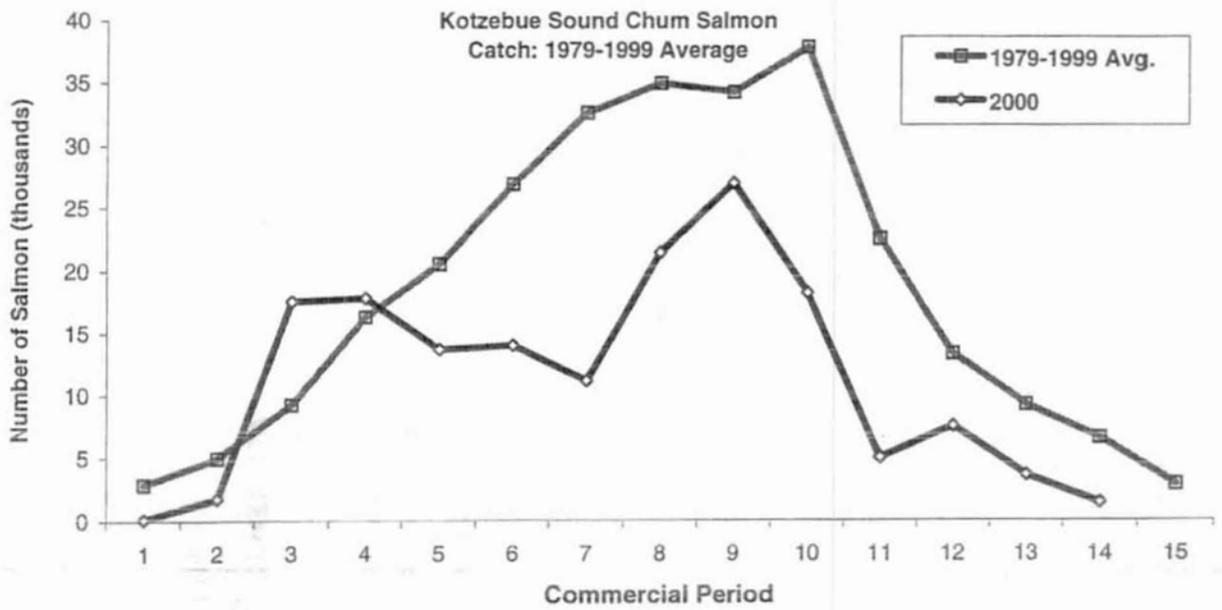
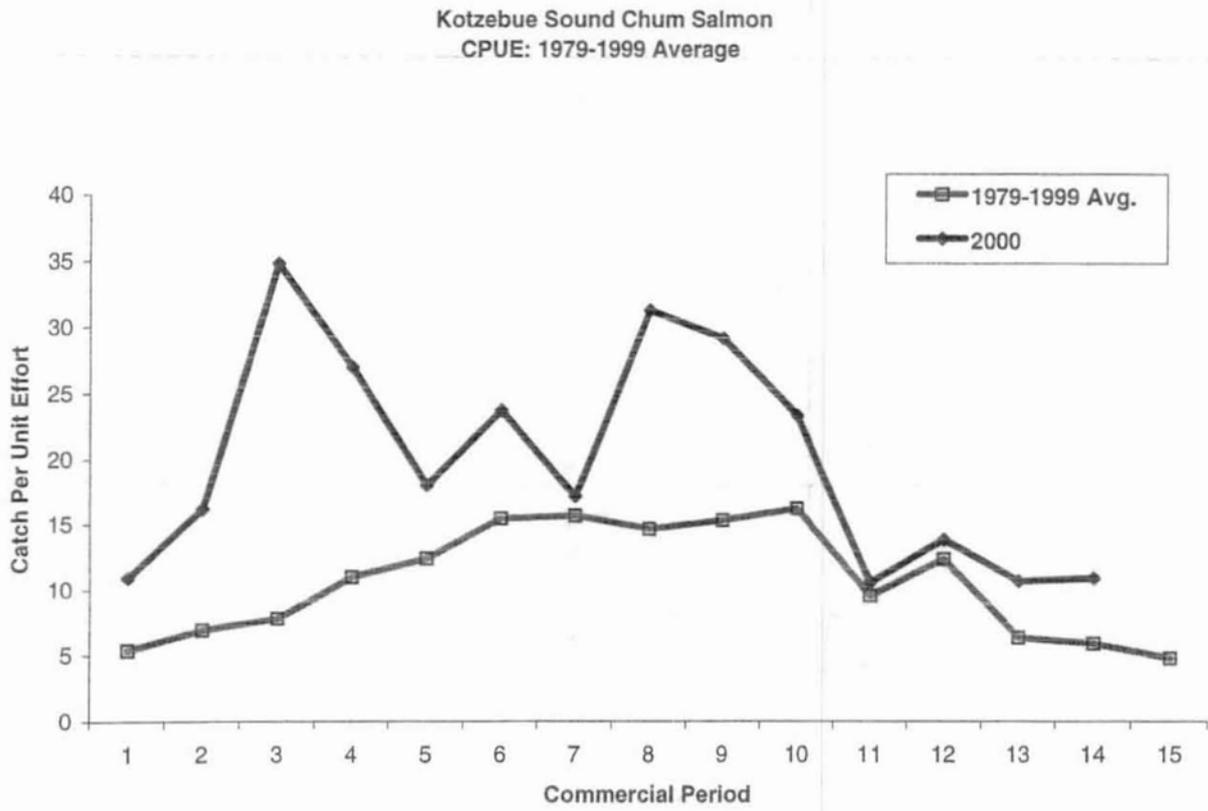


Figure 5. Kotzebue Sound CPUE and commercial chum salmon catch for 2000 vs historical average.

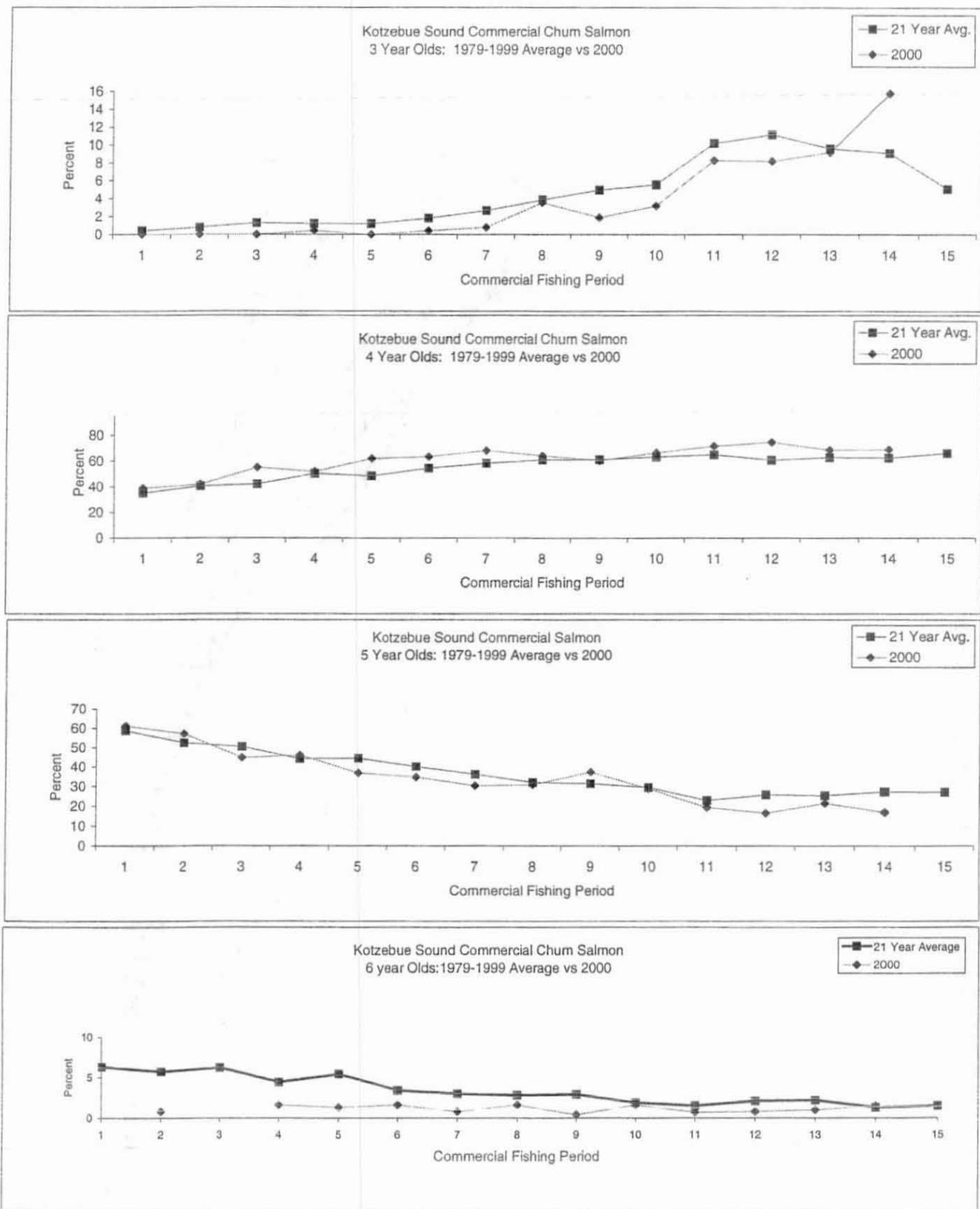


Figure 6. Age Composition of the Kotzebue Sound Commercial Chum Salmon Catch.

Kobuk River Test Fish Cumulative CPUE 1993-2000

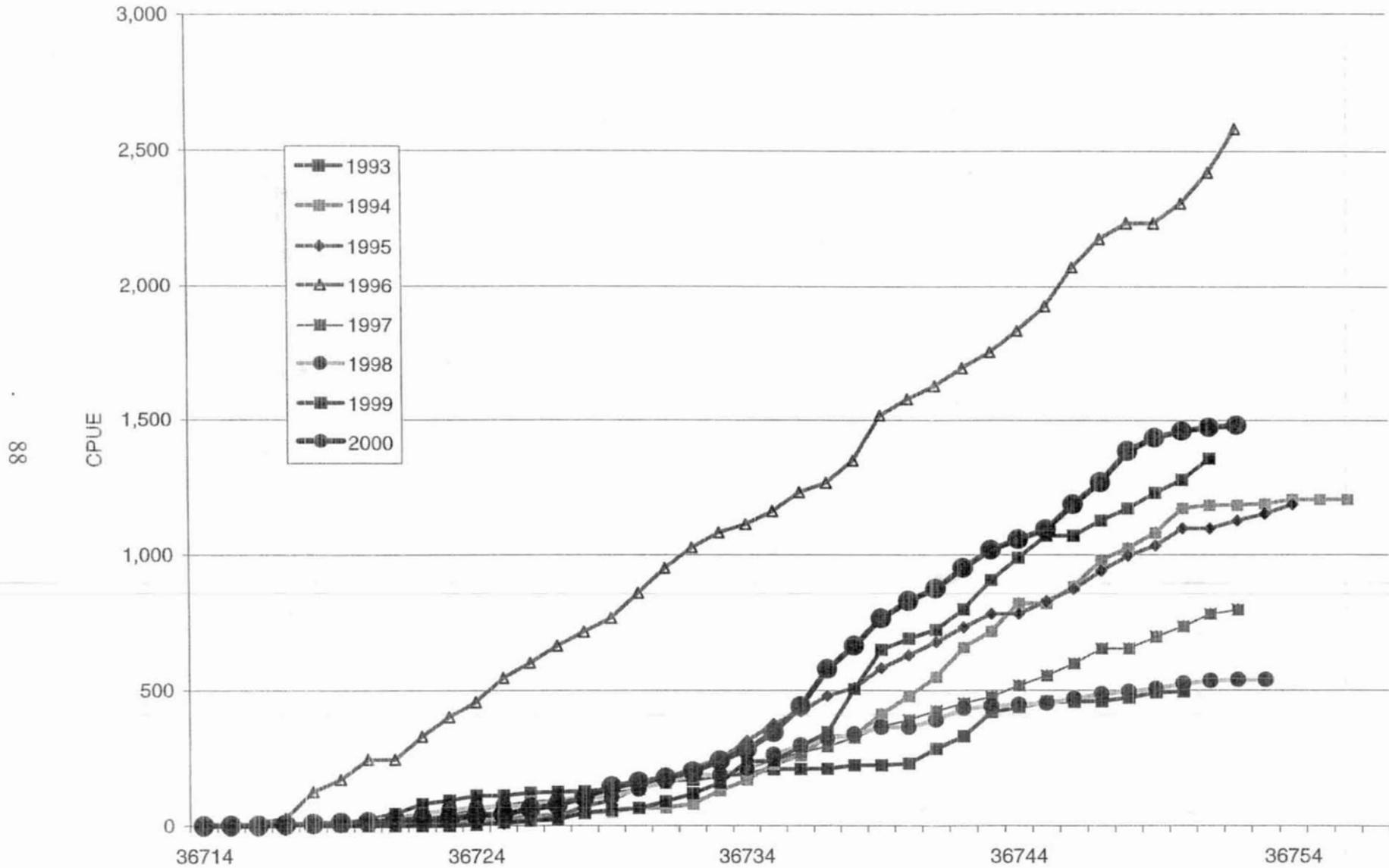


Figure 7. Kobuk River chum salmon drift test fish cumulative CPUE, 1993-2000.

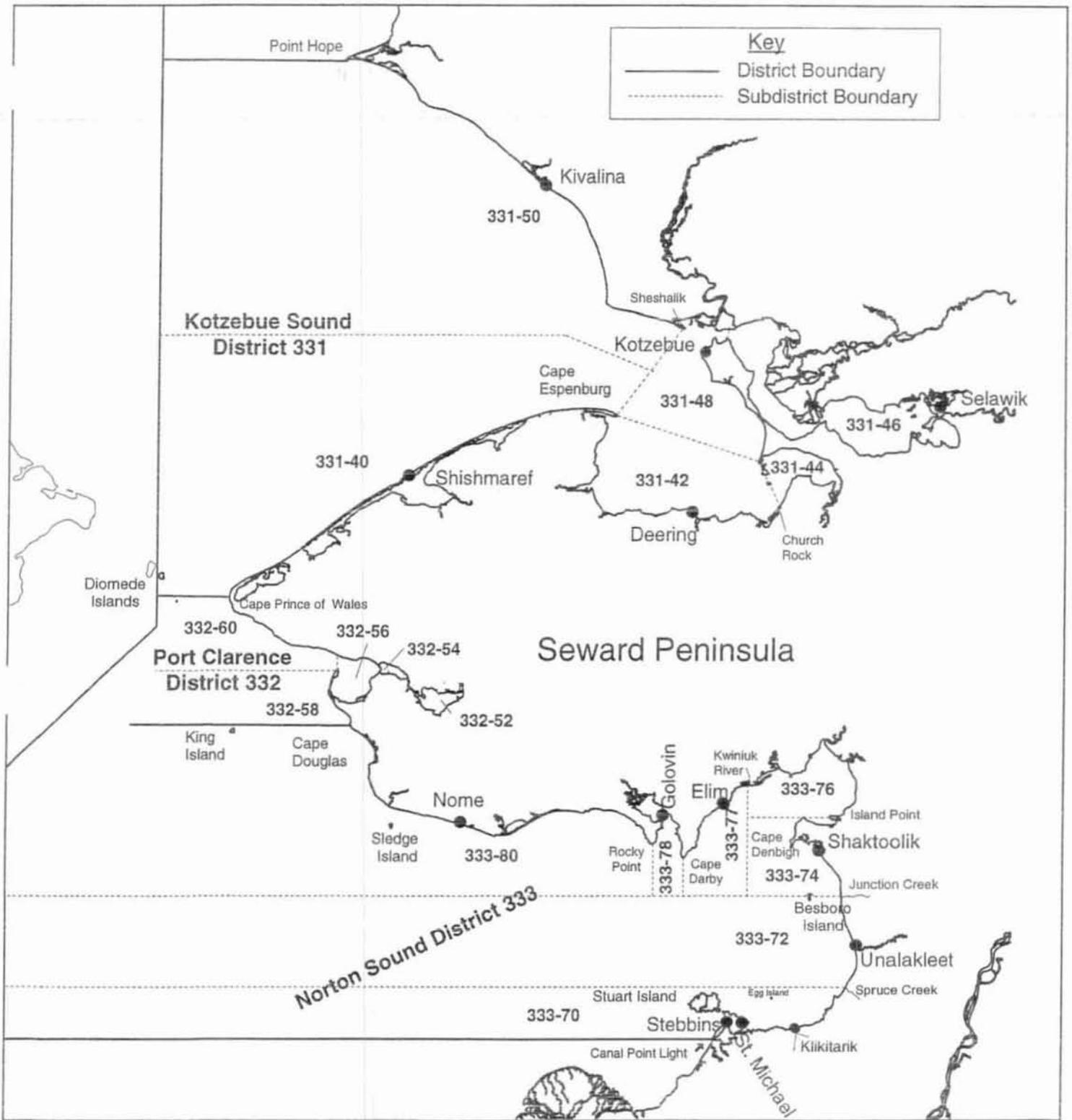


Figure 8. Statistical areas of the Norton Sound, Port Clarence and Kotzebue Sound commercial herring fishing districts.

Norton Sound District
Age Composition of Commercial Gear Combined

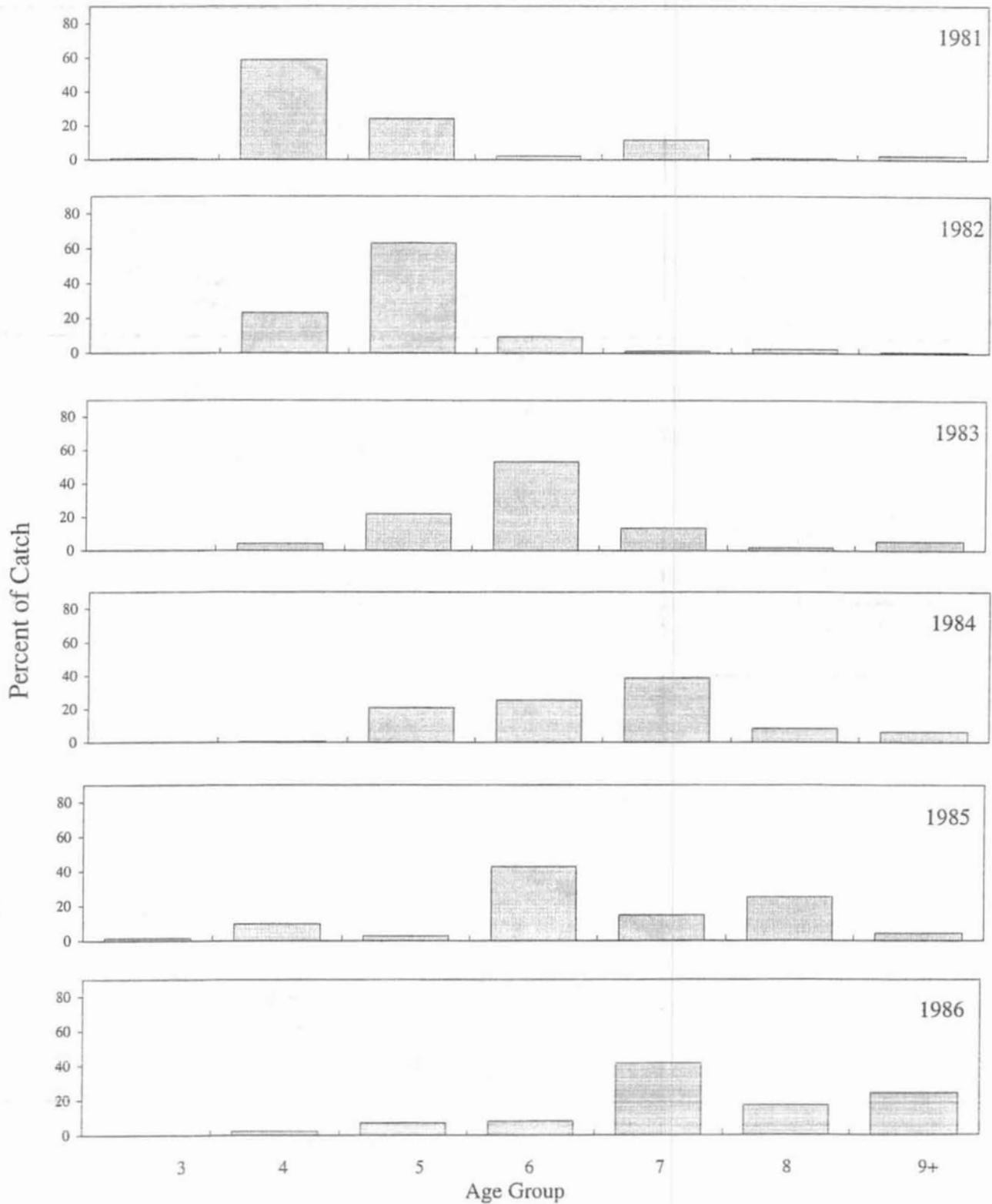


Figure 9. Norton Sound herring age class composition by percentage of commercial catch, commercial gear combined (beach seine and gillnets), 1981-2000. (page 1 of 4)

Norton Sound District
Age Composition of Commercial Gear Combined

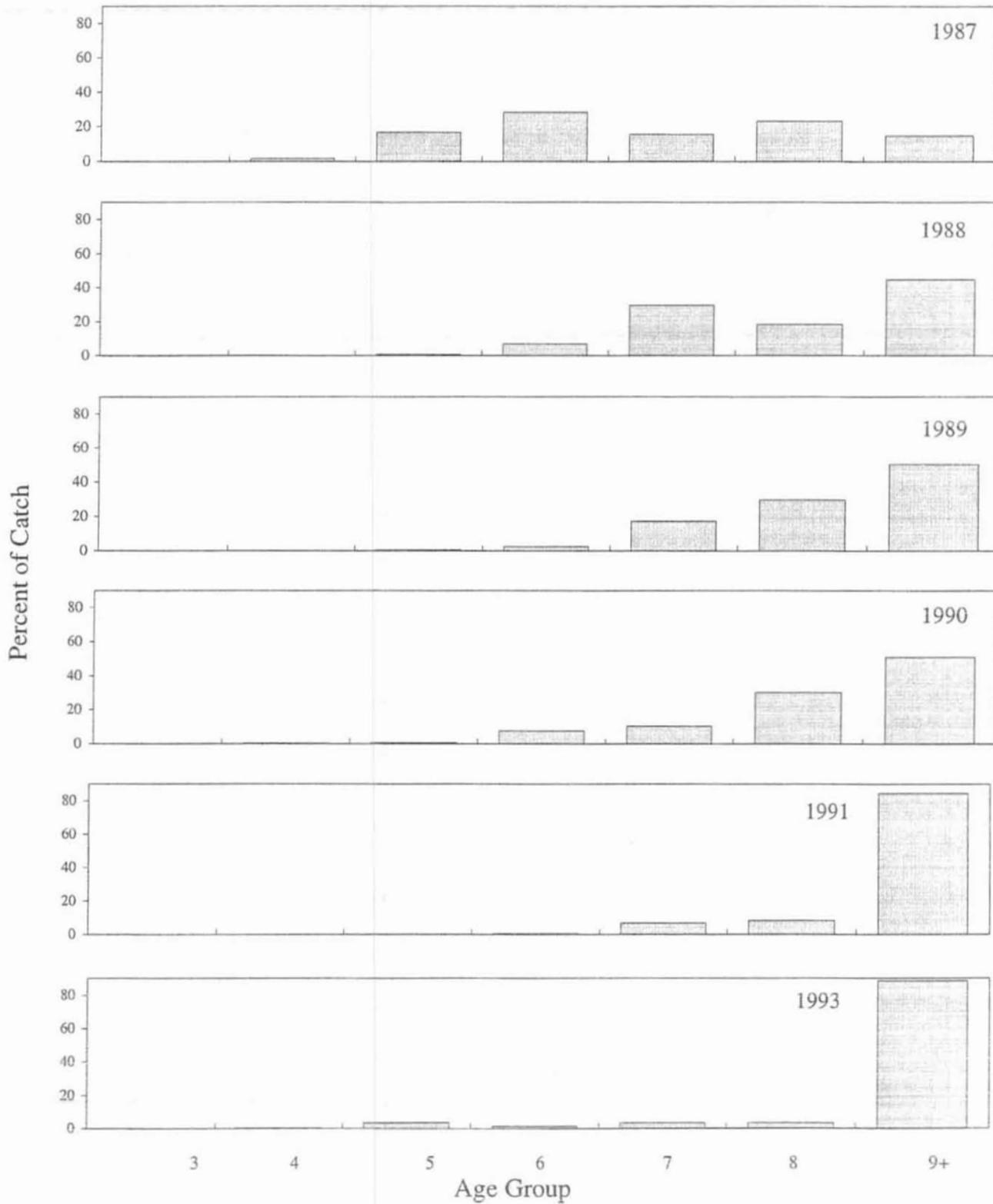


Figure 9. (page 2 of 4)
note: No commercial fishing occurred in 1992.

Norton Sound District
Age Composition of Commercial Gear Combined

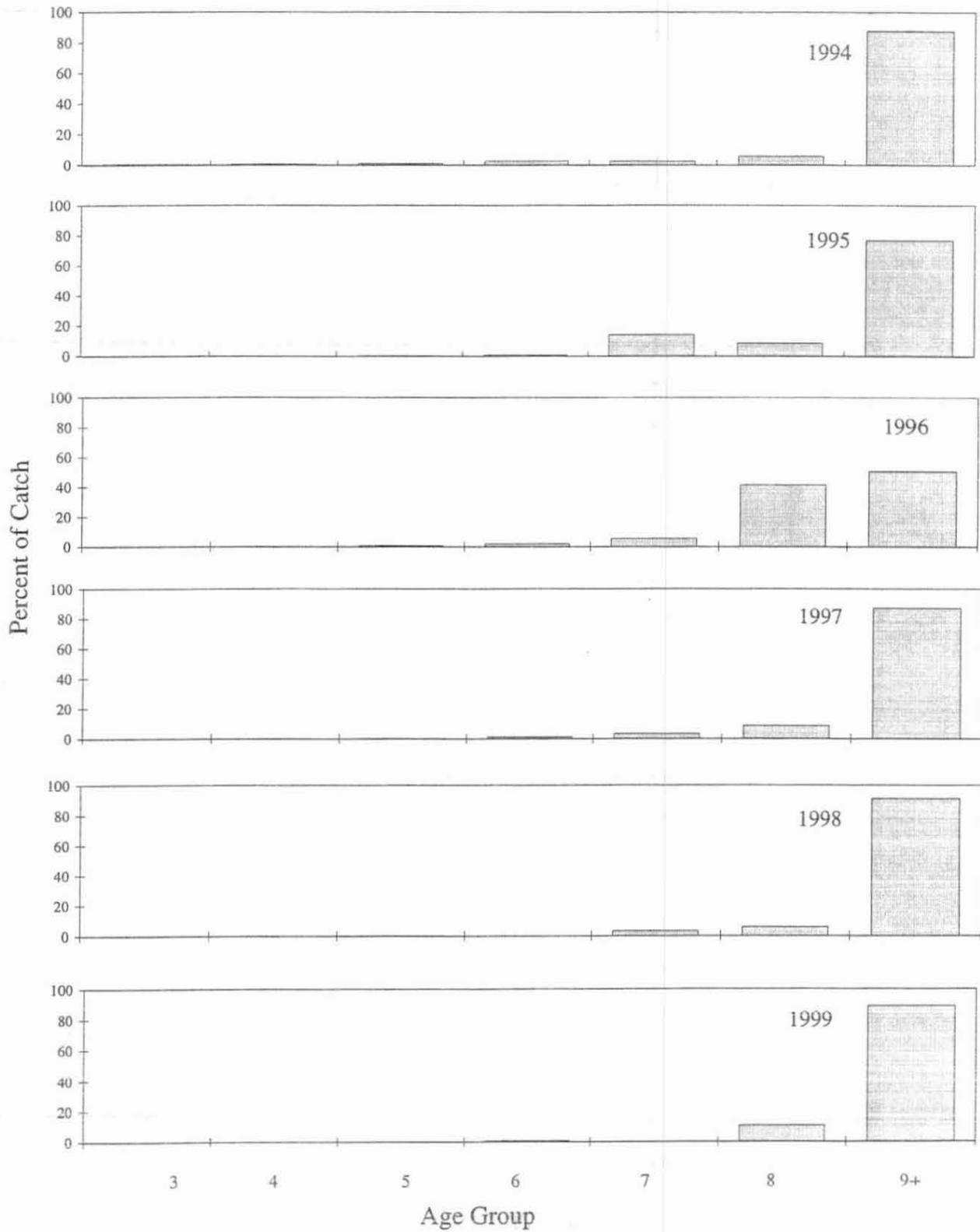


Figure 9. (page 3 of 4)

Note: No commercial catch from beach seine gear in 1998 and 1999.

Norton Sound District
Age Composition of Commercial Gear Combined

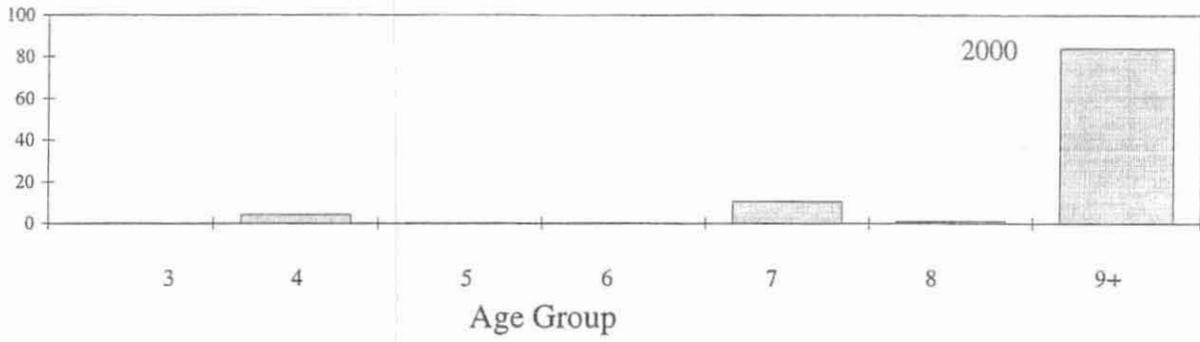


Figure 9. (page 4 of 4)

Norton Sound District
Age Composition of Variable Mesh Gillnets

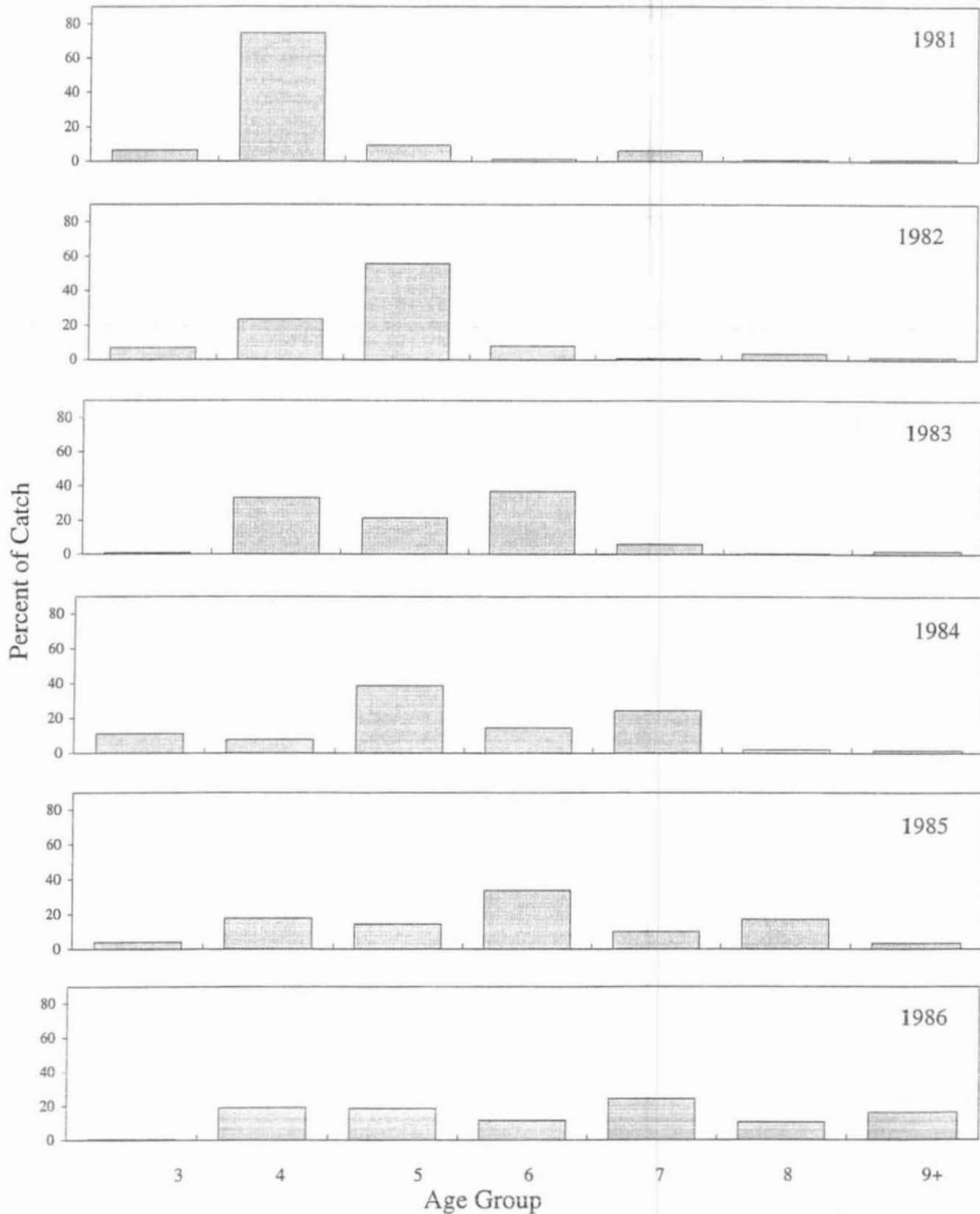


Figure 10. Norton Sound herring age class composition by percentage of total catch, variable mesh gillnets, 1981-2000. (page 1 of 4)

Norton Sound District
 Age Composition of Variable Mesh Gillnets

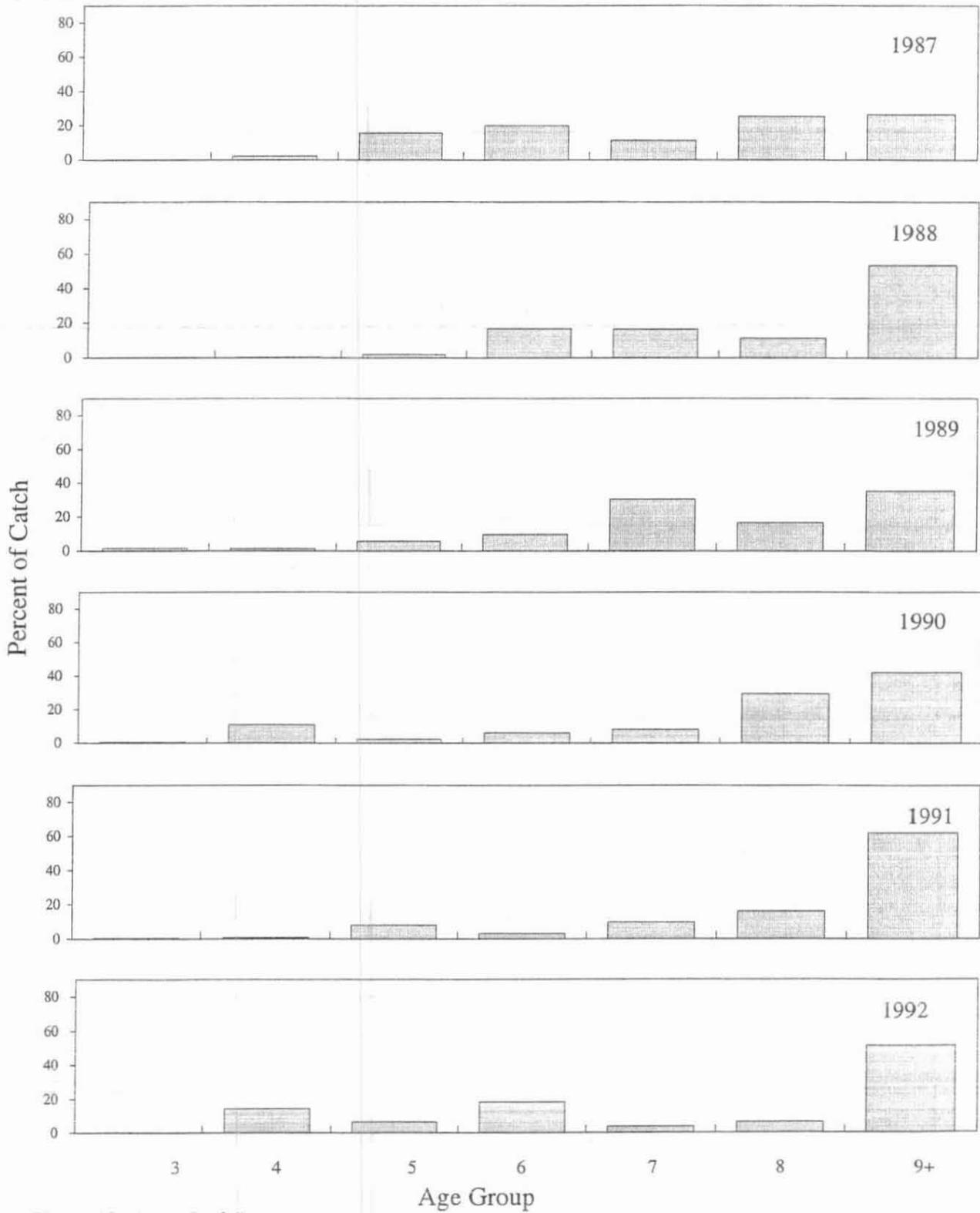


Figure 10. (page 2 of 4)

Norton Sound District
Age Composition of Variable Mesh Gillnets

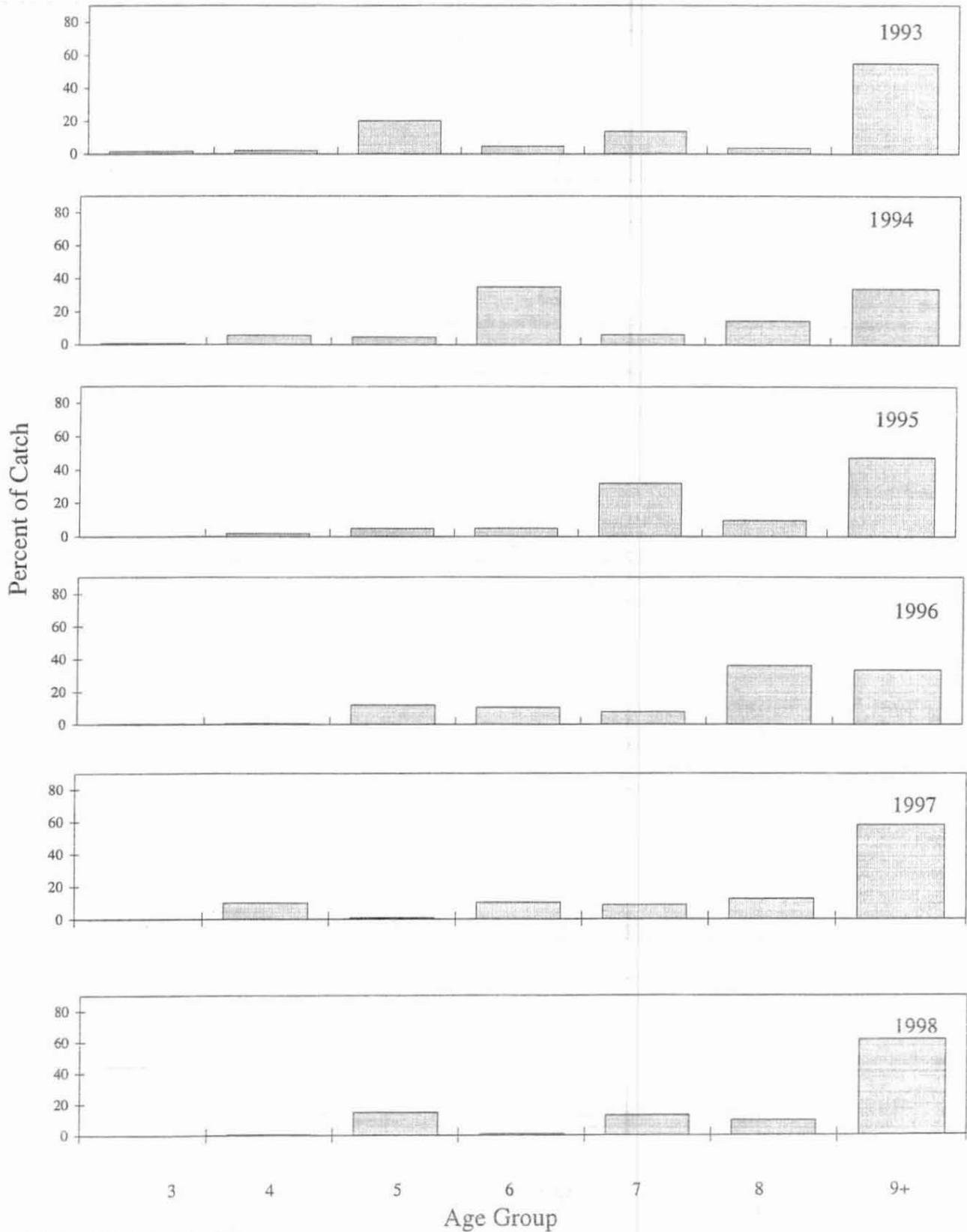


Figure 10. (page 3 of 4)

Norton Sound District
Age Composition of Variable Mesh Gillnets

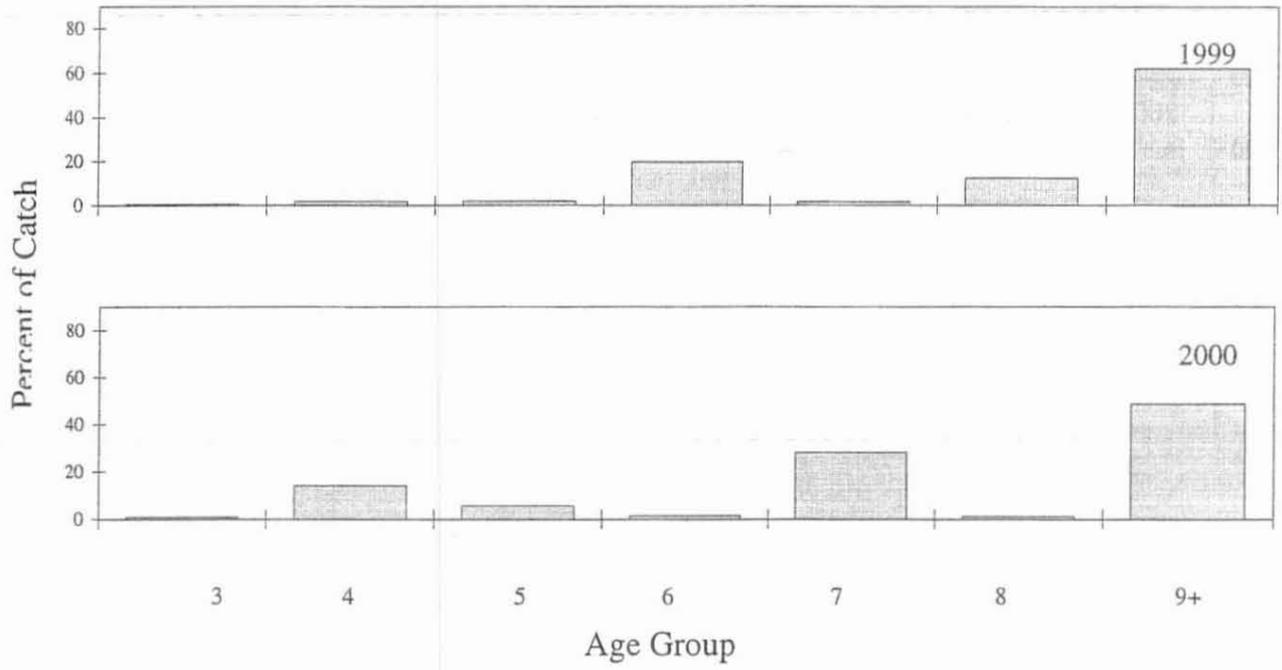


Figure 10. (page 4 of 4)

NORTON SOUND HERRING 2000 Catch and the 2001 Projection

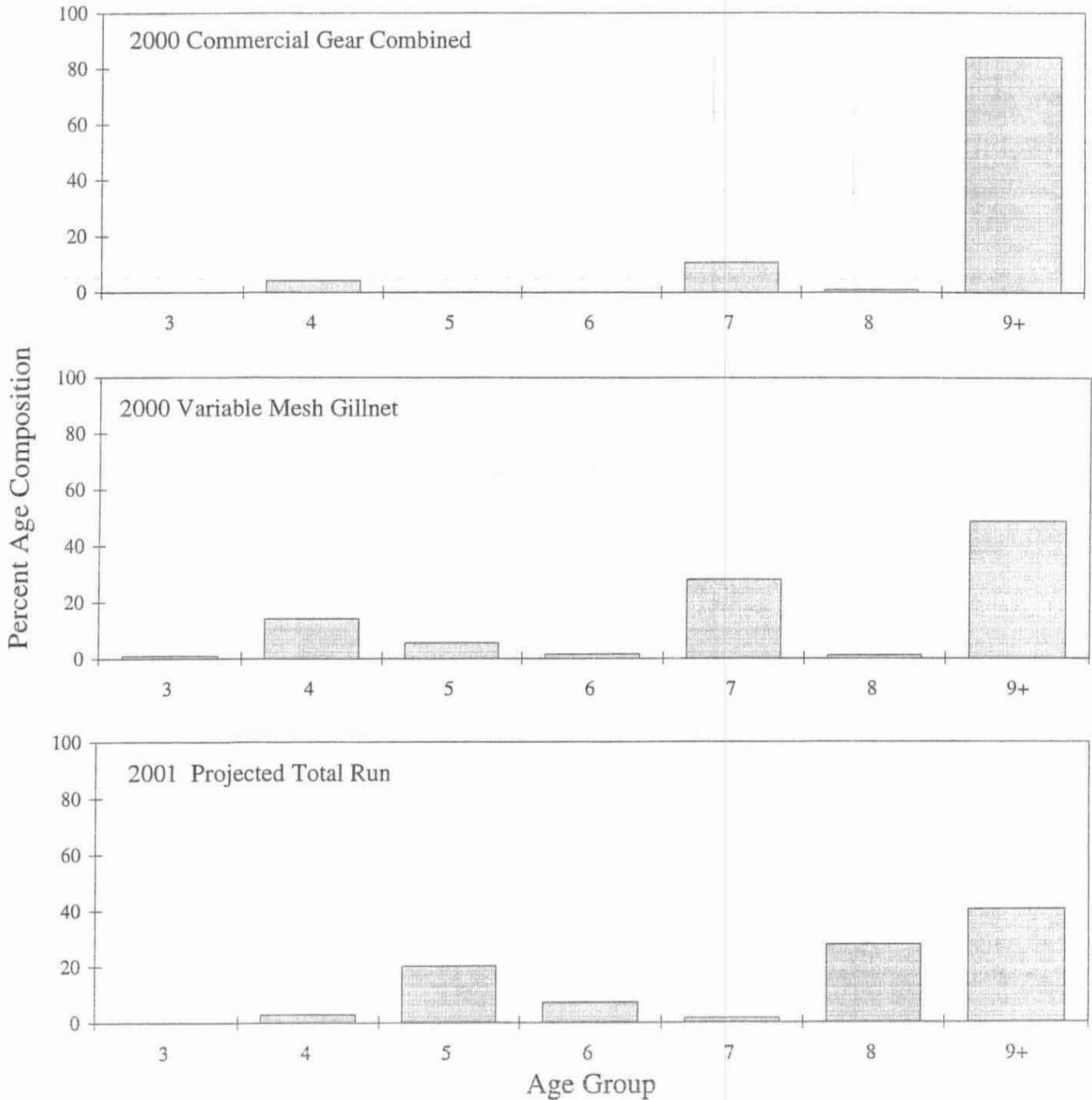


Figure 11. Norton Sound Pacific herring age composition comparison of the 2000 commercial gillnet gear, variable mesh gear, and the projected age composition of the 2001 return.

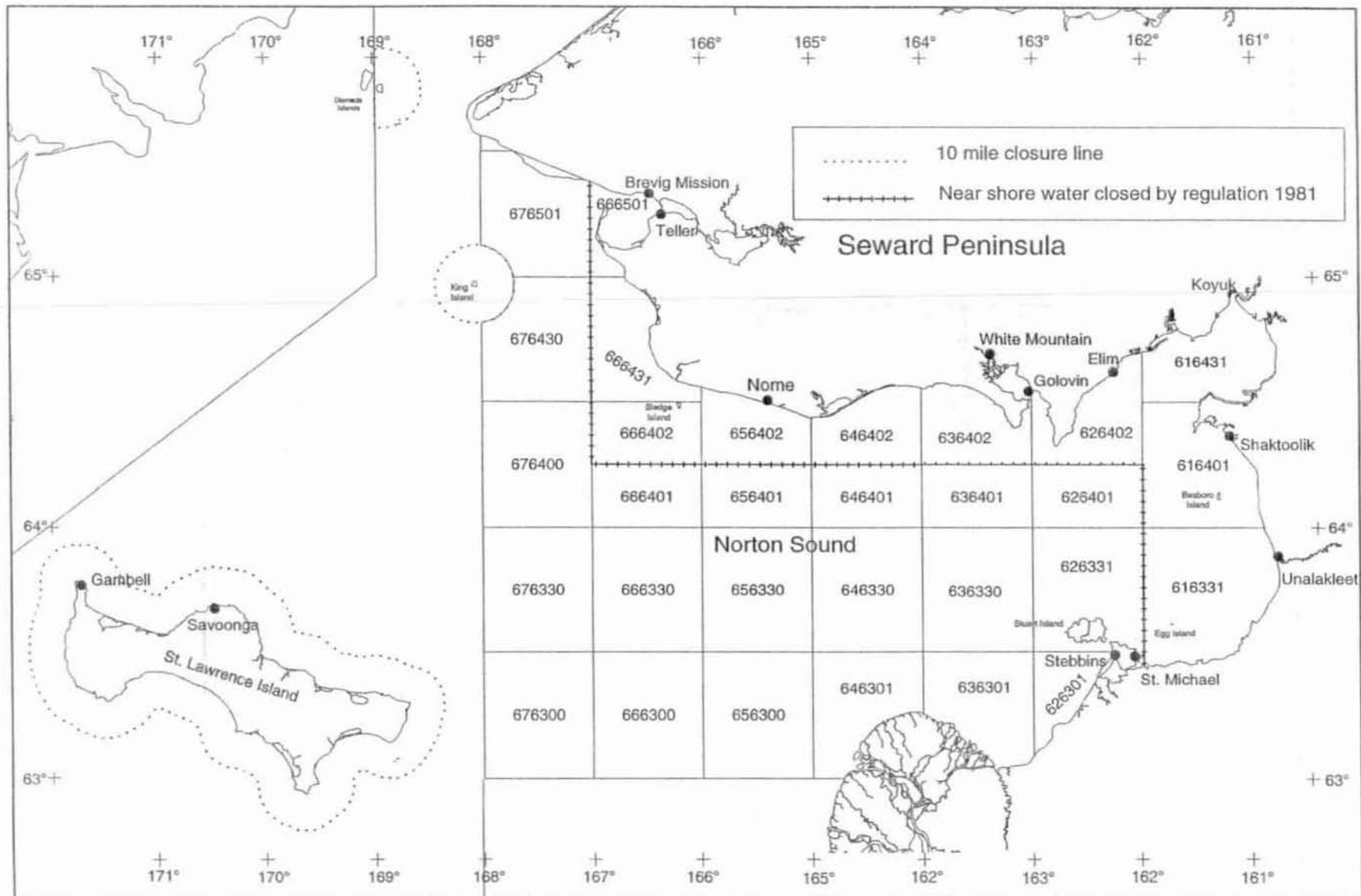


Figure 12. Statistical areas for the Norton Sound red king crab fishery.

Norton Sound Red King Crab

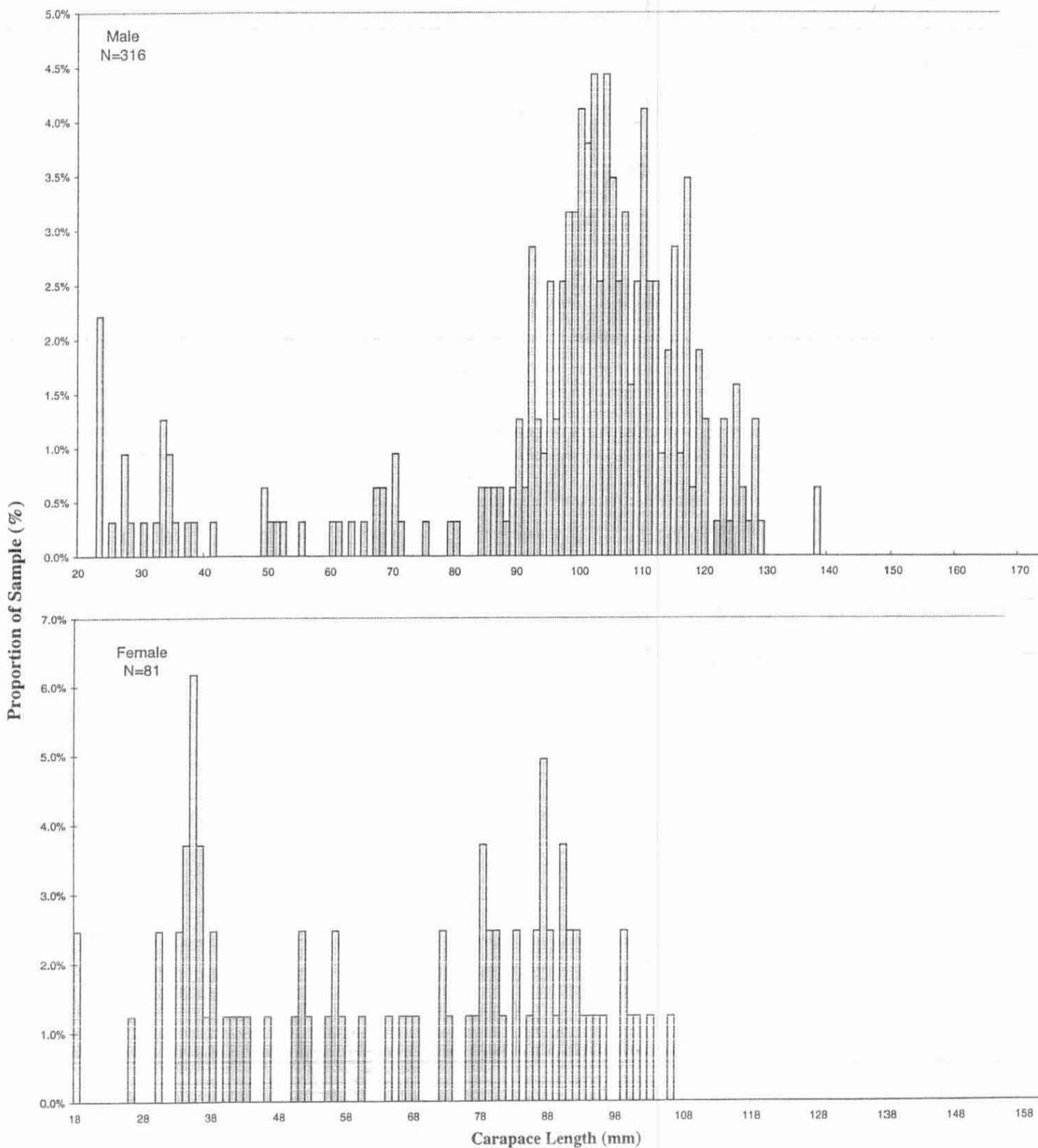


Figure 13. Norton Sound male and female red king crab size distribution from a trawl assessment survey conducted by ADF&G, 1999.

Norton Sound Red King Crab

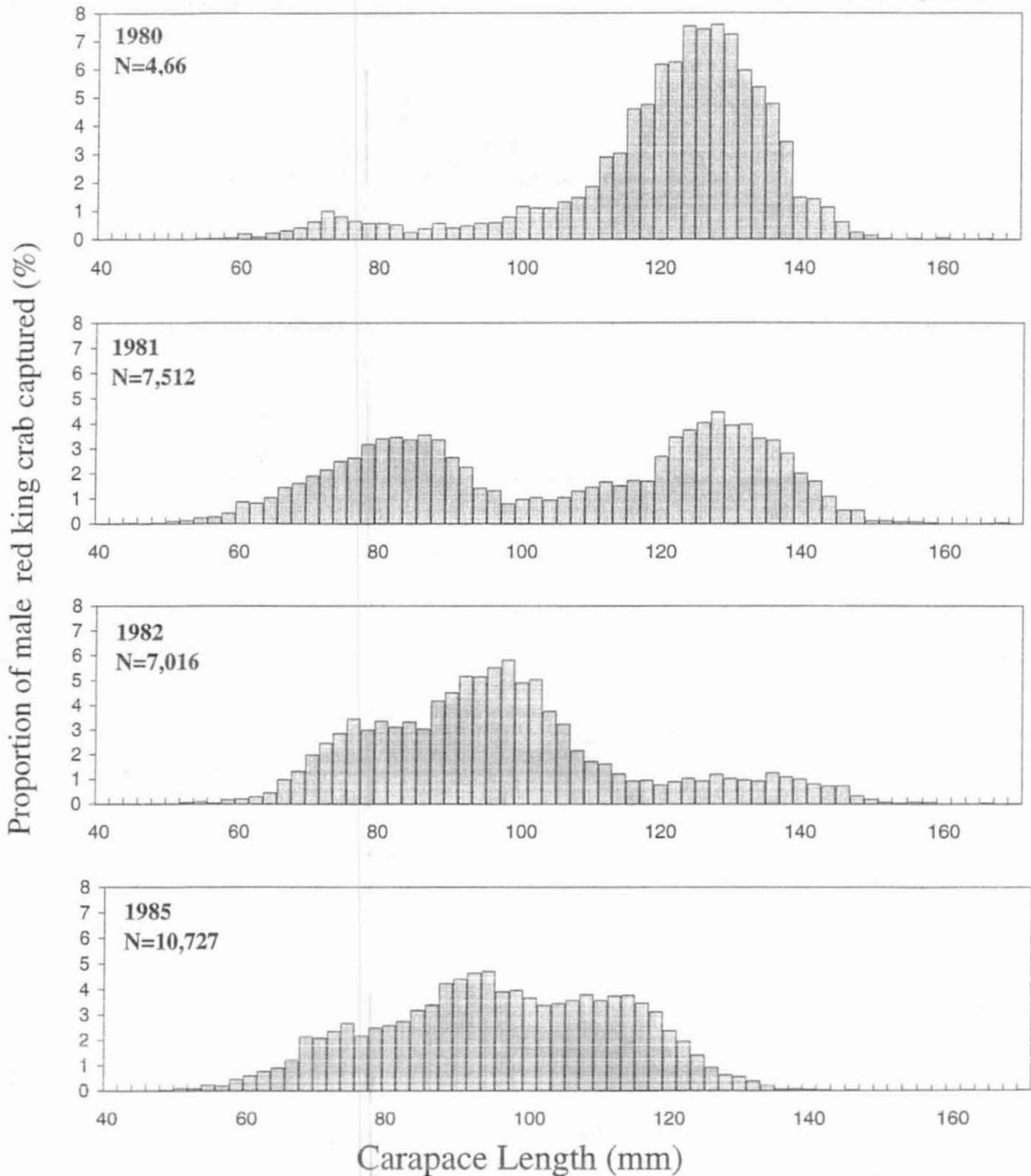


Figure 14. Norton Sound male red king crab size distribution from pot assessment surveys conducted by the Alaska Department of Fish and Game, 1980, 1981, 1982, and 1985.

Norton Sound Red King Crab

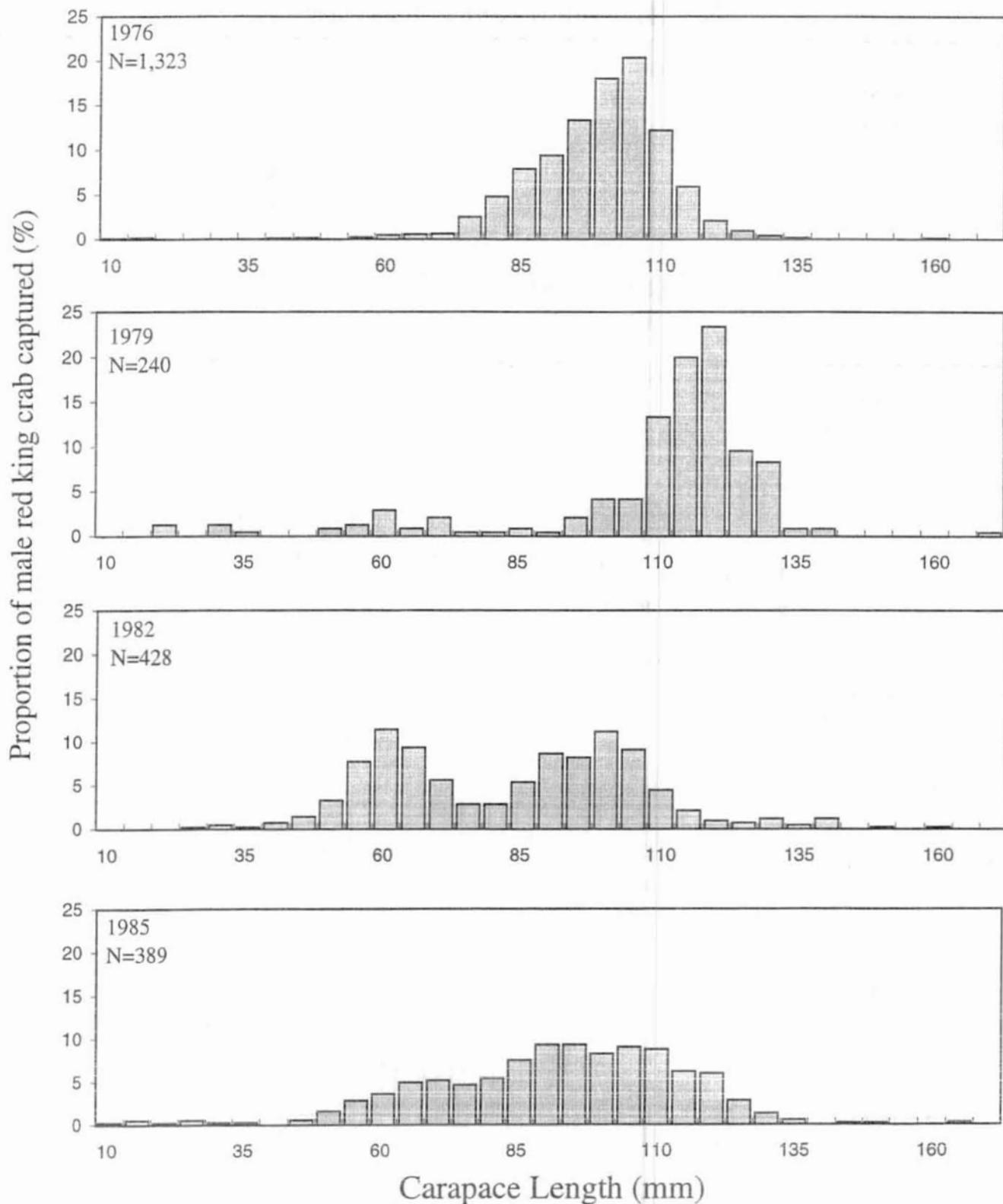


Figure 15. Norton Sound male red king crab size distribution from trawl assessment surveys conducted by the National Marine Fisheries Service, 1976, 1979, 1982, 1985, 1988, 1991, and by ADF&G in 1996, and 1999 (Page 1 of 2).

Norton Sound Red King Crab

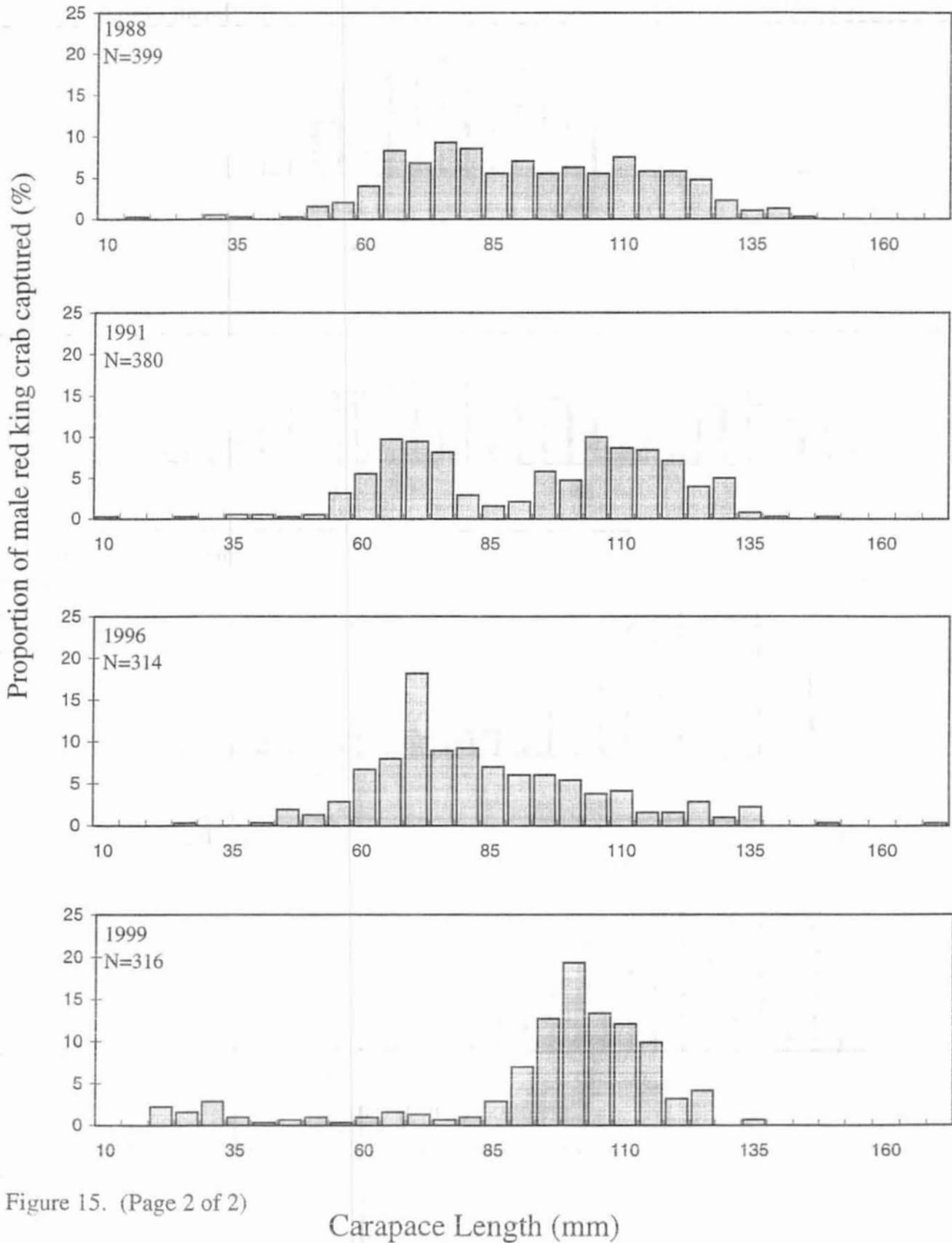


Figure 15. (Page 2 of 2)

Norton Sound Red King Crab

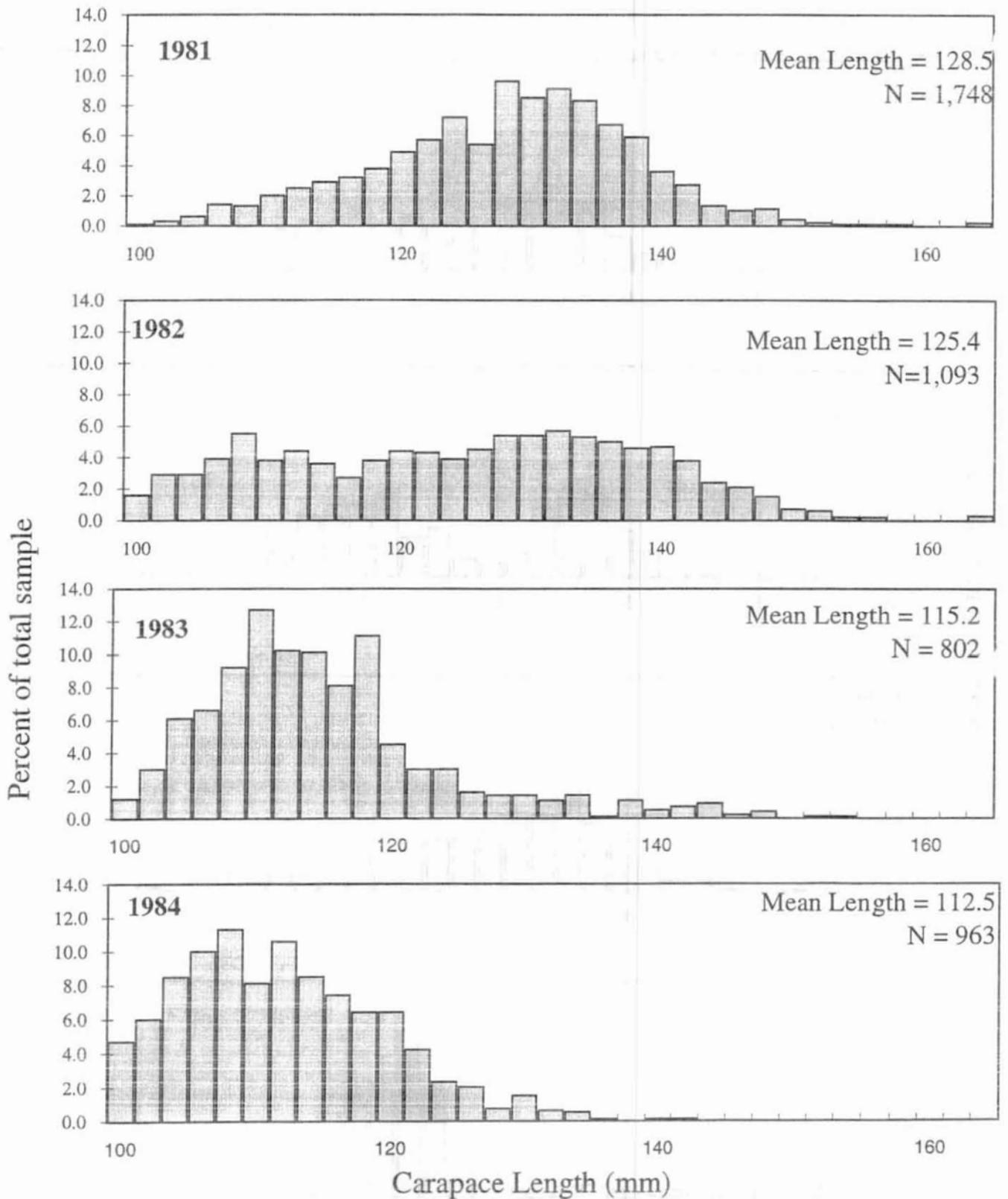


Figure 16. Length composition of Norton Sound red king crab summer commercial harvests, 1981-2000.

Norton Sound Red King Crab

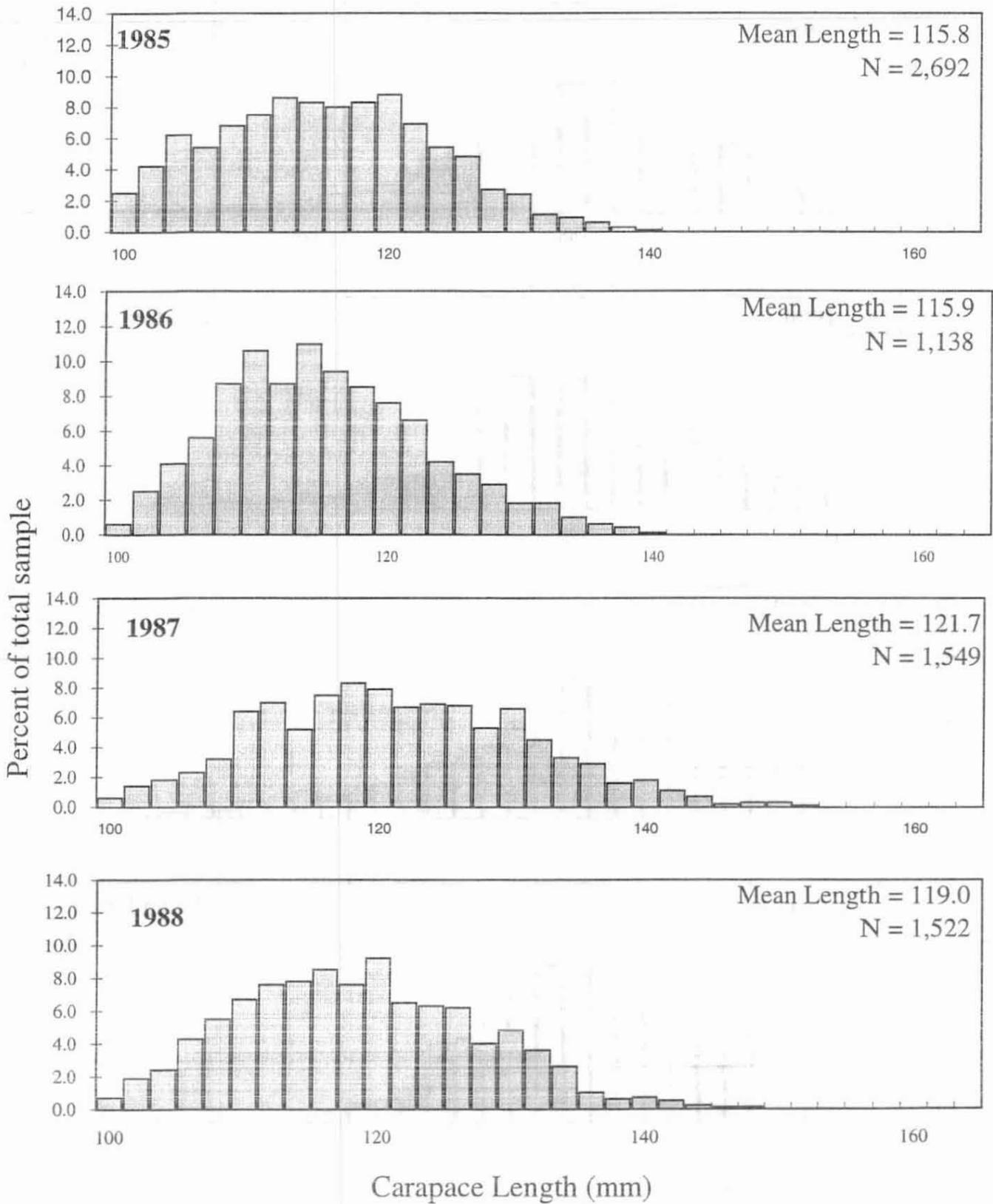


Figure 16. (page 2 of 5)

Norton Sound Red King Crab

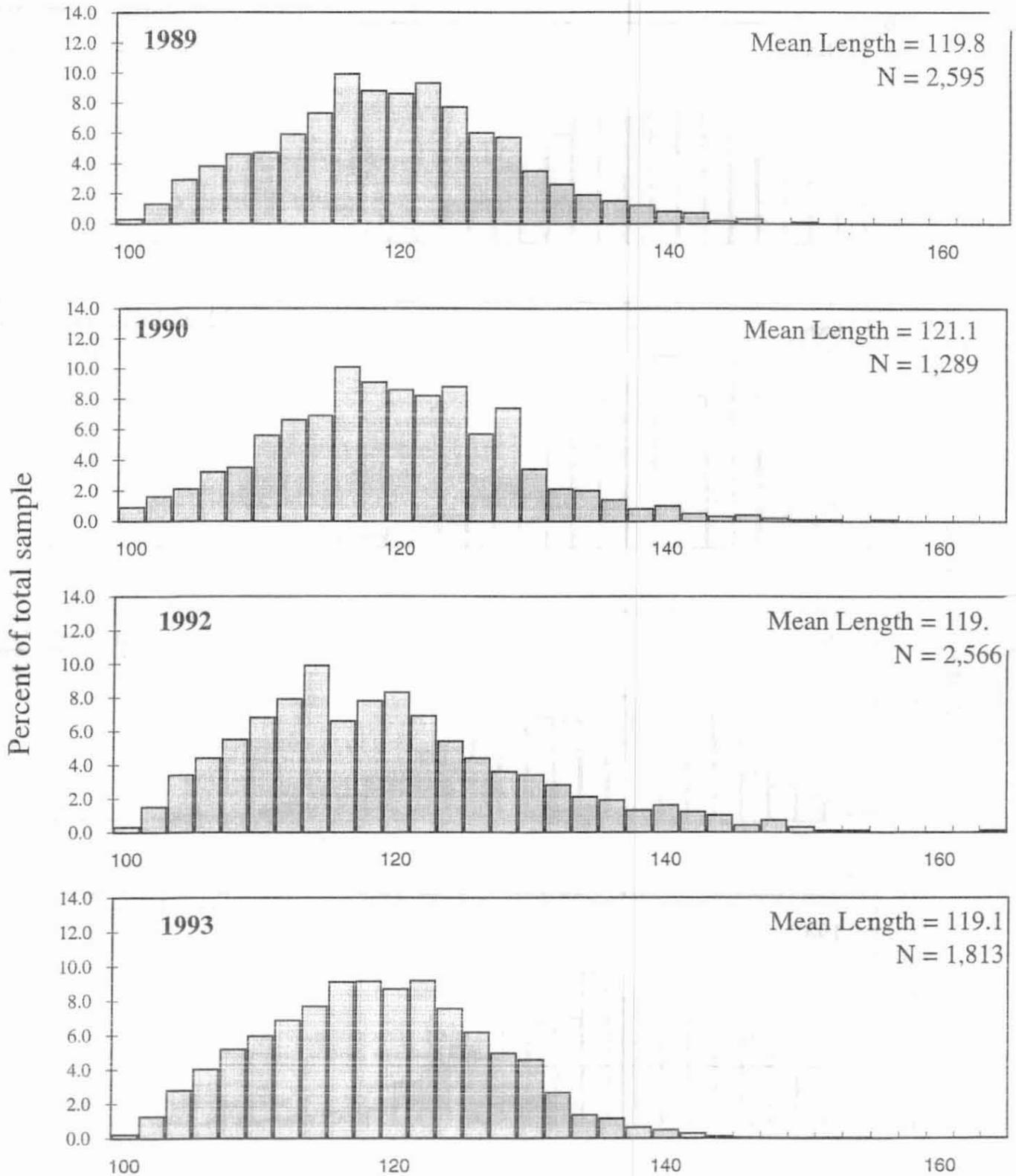


Figure 16. (page 3 of 5)

Note: There was no fishery in 1991.

Norton Sound Red King Crab

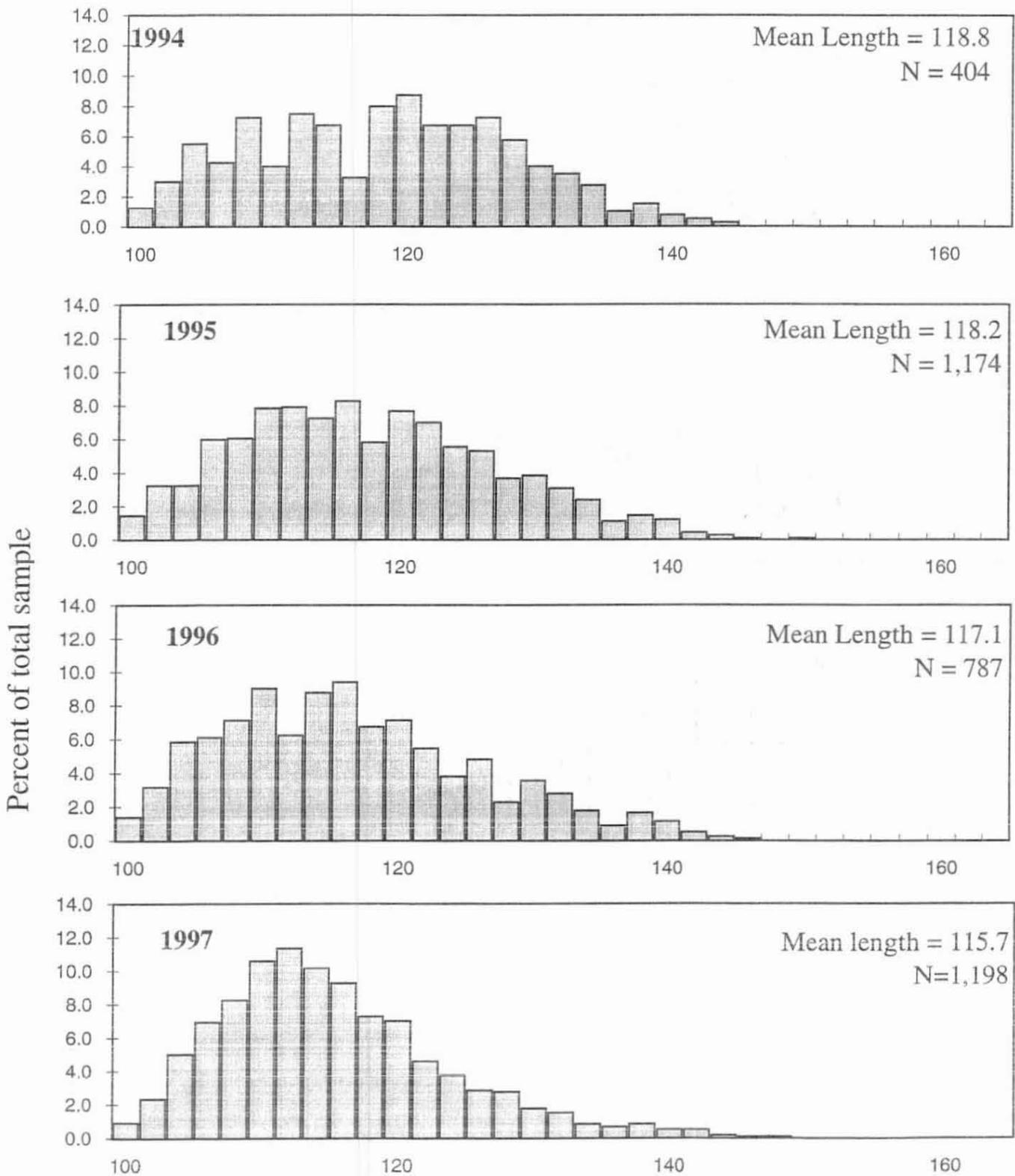


Figure 16. (page 4 of 5)

Norton Sound Red King Crab

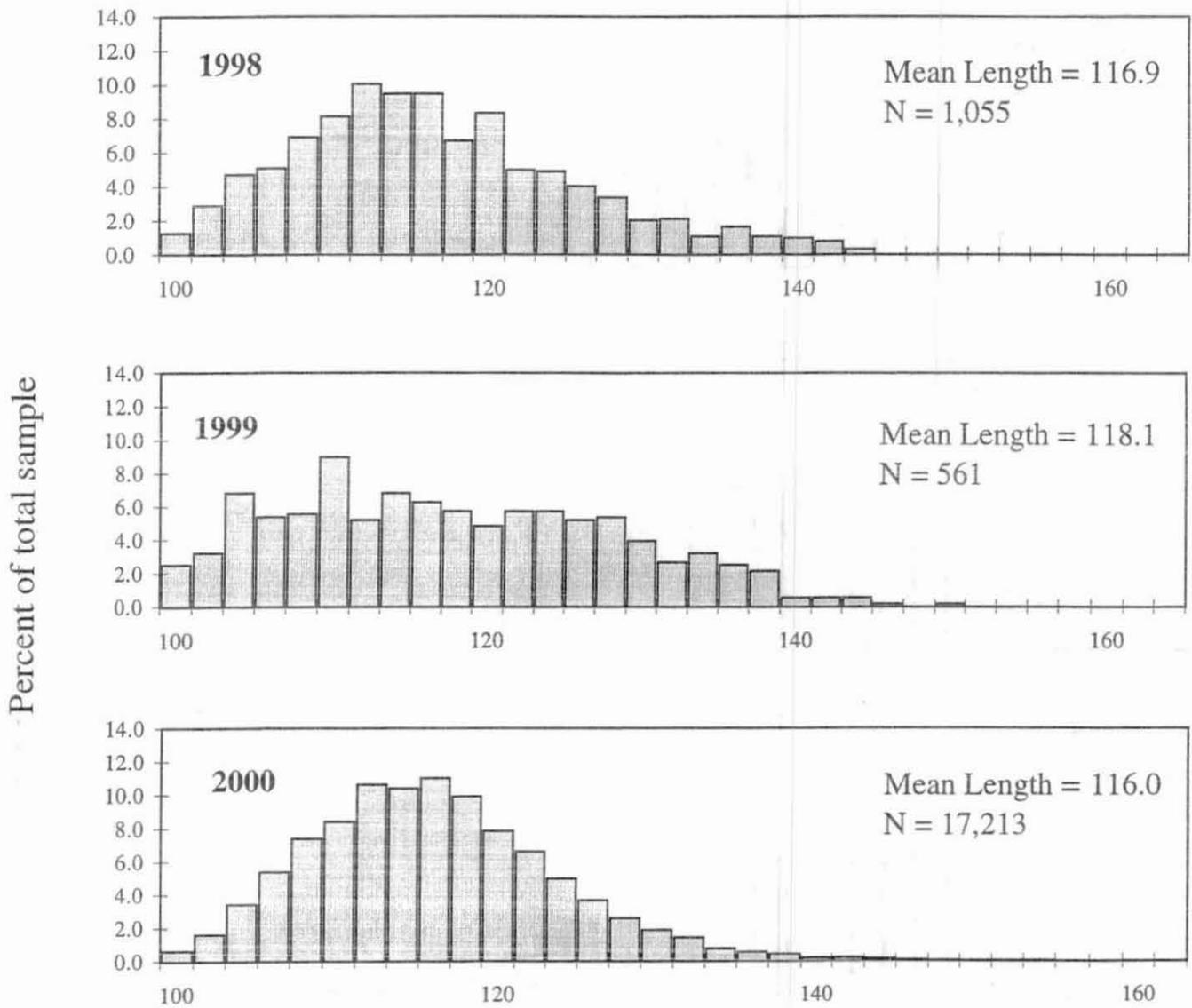


Figure 16. (page 5 of 5)

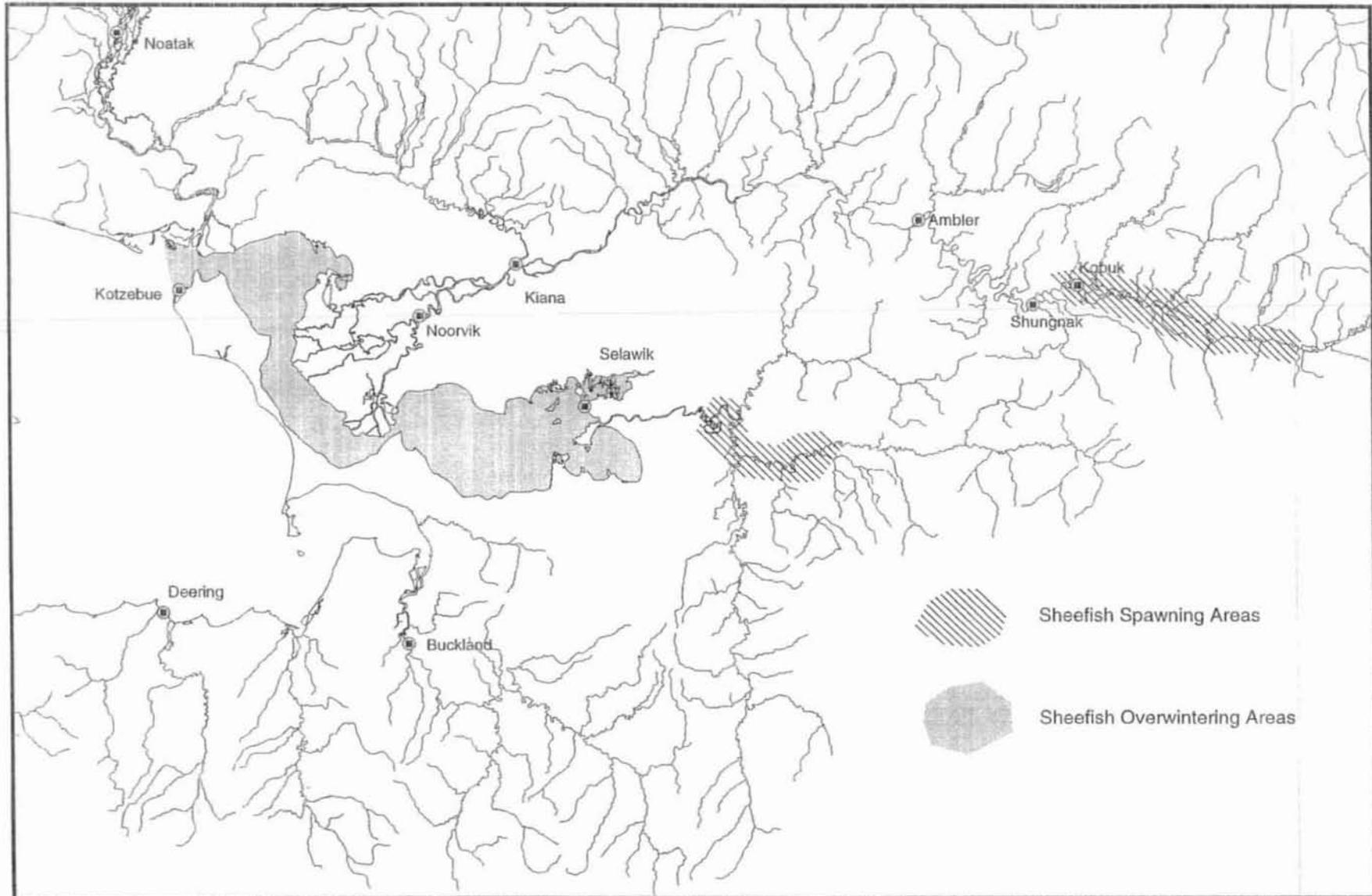


Figure 17. Kotzebue and Kobuk River Valley villages and their spatial relationship with inconnu spawning and overwintering areas.

Appendix Table A1. Number of commercial salmon permits fished, Norton Sound, 1970-2000.

Year	SUBDISTRICT						District ^a
	1	2	3	4	5	6	Totals
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

^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, 1964-2000.^c

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	-	-	1,794	1,762	3,568	13	-	32	1,795	2,343	4,183
1967	-	-	-	72	406	478	11	-	-	349	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	2,163	8,364	10,848	2	-	97	6,267	2,858	9,224	4	-	416	8,430	11,222	20,072
1976	2	10	26	1,331	7,620	8,989	13	-	189	5,492	1,705	7,399	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	13,922	23,937	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	-	820	-	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
1986	6	-	50	-	8,160	8,216	150	107	688	8,720	8,085	17,750	156	107	738	8,720	16,245	25,966
1987	3	-	577	-	5,646	6,226	200	107	1,100	1,251	8,394	11,052	203	107	1,677	1,251	14,404	17,278
1988	2	-	54	182	1,628	1,866	63	133	1,076	2,159	5,952	9,383	65	133	1,130	2,341	7,580	11,249
1989	2	0	0	123	492	617	24	131	469	924	3,399	4,947	26	131	469	1,047	3,891	5,564
1990	0	0	0	0	0	0	58	234	510	2,233	4,246	7,281	58	234	510	2,233	4,246	7,281
1991	0	0	0	0	0	0	83	166	1,279	194	3,715	5,437	83	166	1,279	194	3,715	5,437
1992	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
1993	0	2	611	0	132	745	52	80	2,070	873	1,766	4,841	52	82	2,681	873	1,898	5,586
1994	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
1995	0	1	369	0	122	492	36	211	1,897	486	5,344	7,974	36	212	2,266	486	5,466	8,466
1996	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
1997	0	0	0	0	0	0	19	99	534	287	4,996	5,936	19	99	534	287	4,996	5,936
1998	0	0	0	0	0	0	15	14	1,057	4,797	964	6,847	15	14	1,057	4,797	964	6,847
1999	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
5-year avg. ^a	0	0	76	3	25	103	20	152	993	2,286	3,195	6,647	20	153	1,069	2,289	3,220	6,750
10-year avg. ^b	0	1	197	20	120	338	47	147	1,129	2,864	2,906	7,093	47	148	1,326	2,884	3,026	7,431

^a 1995-1999^b 1990-1999^c Subsistence harvest are incomplete prior to 1979.

Appendix Table A3. Commercial and subsistence salmon catches by species, by year in Golovin Subdistrict, Norton Sound District, 1962-2000.

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
1962	45	11	264	10,276	68,720	79,316	-	-	-	-	-	-	45	11	264	10,276	68,720	79,316
1963	40	40	-	19,677	49,850	69,607	-	-	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	-	-	2,470	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	52,609	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	39,510	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	3,019	55,781	60,302	12	2	430	1,904	9,577	11,925 ^c	205	115	1,626	4,923	65,358	72,227
1986	81	8	958	25,425	69,725	96,197	-	-	-	-	-	- ^c	-	-	-	-	-	-
1987	166	51	2,203	1,579	44,334	48,333	-	-	-	-	-	- ^c	-	-	-	-	-	-
1988	108	921	2,149	31,559	33,348	68,085	-	-	-	-	-	- ^c	-	-	-	-	-	-
1989	0	0	0	0	0	0	-	-	-	-	-	- ^c	-	-	-	-	-	-
1990	52	21	0	0	15,993	16,066	-	-	-	-	-	- ^c	-	-	-	-	-	-
1991	49	1	0	0	14,839	14,889	-	-	-	-	-	- ^c	-	-	-	-	-	-
1992	6	9	2,085	0	1,002	3,102	-	-	-	-	-	- ^c	-	-	-	-	-	-
1993	1	4	2	8,480	2,803	11,290	-	-	-	-	-	- ^c	-	-	-	-	-	-
1994	0	0	3,424	0	111	3,535	253	168	733	8,410	1,337	10,901 ^d	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	7,818	10,373	20,039 ^d	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	20	8,003	8,146	138	427	555	4,570	4,891	10,581 ^d	157	429	657	4,590	12,894	18,727
1998	1	0	3	106,761	723	107,488	184	37	1,292	13,340	1,893	16,747 ^d	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 ^d	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	169	18	3,980	28,314	1,319	33,800
5-year avg. ^a	4	0	472	22,215	2,143	24,834	127	136	1,549	8,719	4,736	15,267	131	136	2,021	30,935	6,879	40,101
10-year avg. ^b	13	4	787	11,956	4,546	17,305	-	-	-	-	-	-	-	-	-	-	-	-

^a 1995-1999

^b 1995-2000

^c survey not conducted.

^d 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, 1962-2000.

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
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	29,726	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	1,995	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	9,849	40,030	50,450	1	-	1,835	3,785	3,537	9,158	254	-	2,153	13,634	43,567	59,608
1983	254	-	-	17,027	65,776	83,057	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	5,959	28,035	9,477	43,471	-	-	-	-	-	-	-	-	-	-	-	-
1985	816	32	1,803	559	24,466	27,676	67	-	1,389	1,212	947	3,615	883	32	3,192	1,771	25,413	31,291
1986	600	41	5,874	15,795	20,668	42,978	-	-	-	-	-	-	-	-	-	-	-	-
1987	907	15	64	568	17,278	18,832	-	-	-	-	-	-	-	-	-	-	-	-
1988	663	93	3,974	13,703	18,585	37,018	-	-	-	-	-	-	-	-	-	-	-	-
1989	62	0	0	0	167	229	-	-	-	-	-	-	-	-	-	-	-	-
1990	202	0	0	501	3,723	4,426	-	-	-	-	-	-	-	-	-	-	-	-
1991	161	0	0	0	804	965	312	-	2,153	3,555	2,660	8,680 ^d	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 ^d	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 ^d	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 ^d	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 ^d	288	61	5,095	5,008	4,945	15,397
1996	0	0	1,915	68,609	0	70,524	417	52	1,720	9,442	2,319	13,951 ^d	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 ^d	1,463	50	2,622	1,314	4,747	10,197
1998	105	0	1,462	145,669	2,311	149,547	414	49	1,831	6,891	1,376	10,561 ^d	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 ^d	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 ^d	258	46	6,611	52,352	1,708	60,975
5-year avg. ^a	191	9	1,706	43,448	1,233	46,586	432	36	1,418	4,251	2,055	8,193	622	45	3,124	47,699	3,288	54,779
10-year avg. ^b	132	4	2,147	21,774	1,128	25,185	-	-	-	-	-	-	-	-	-	-	-	-

^a 1995-1999^b 1990-1999^c Subsistence survey not conducted.^d Harvest estimated from Div. of Subsistence survey.^e Data not yet available.

Appendix Table A5. Commercial and subsistence salmon catches by species, by year in Norton Bay Subdistrict, Norton Sound District, 1962-2000.

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	-	-	4,849	3,974	8,849	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	6,201	15,599	25,203	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	9,948	10,928	-	-	-	-	-	-	-	-	-	-	-	-
1986	139	2	1,512	40	1,994	3,687	-	-	-	-	-	-	-	-	-	-	-	-
1987	544	-	145	16	3,586	4,291	-	-	-	-	-	-	-	-	-	-	-	-
1988	434	2	709	1,749	7,521	10,415	-	-	-	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1990 ^a	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
1991 ^a	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
1992	27	0	0	0	1,787	1,814	-	-	-	-	-	-	-	-	-	-	-	-
1993	267	0	0	290	1,378	1,935	-	-	-	-	-	-	-	-	-	-	-	-
1994 ^a	0	0	0	0	0	0	308	1	370	6,049	4,581	11,309 ^a	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 ^a	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 ^a	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 ^a	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 ^a	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 ^a	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 ^a	397	2	267	2,255	4,714	7,635
5-year avg. ^a	39	0	0	0	106	145	487	21	508	2,638	4,875	8,511	526	21	508	2,638	4,981	8,656
10-year avg. ^b	49	0	0	29	370	447	-	-	-	-	-	-	-	-	-	-	-	-

^a 1995-1999

^b 1990-1999

^c survey not conducted.

^d official 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, 1961-2000.

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	3,420	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	2,504	4,900	10	-	458	6,355	1,915	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	-	155	2,301	15,753	18,406	43	-	210	2,474	2,016	4,743	240	-	365	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	6,450	14,500	21,416	51	-	130	3,410	1,397	4,988	340	-	307	9,860	15,897	26,404
1974	583	-	179	5,650	26,391	32,803	93	-	353	1,901	358	2,705	676	-	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	46,236	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	-	3,383	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	1,086	-	8,001	1,947	27,453	38,487	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	-	-	-	-	-	-	-	-	-	-	-	-
1984	1,613	-	10,730	1,596	32,309	46,248	-	-	-	-	-	-	-	-	-	-	-	-
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
1986	1,075	29	6,626	-	16,126	23,856	-	-	-	-	-	-	-	-	-	-	-	-
1987	2,214	-	6,193	-	14,088	22,495	-	-	-	-	-	-	-	-	-	-	-	-
1988	671	79	6,096	3,681	21,521	32,048	-	-	-	-	-	-	-	-	-	-	-	-
1989	1,241	43	8,066	0	19,641	28,991	-	-	-	-	-	-	-	-	-	-	-	-
1990	2,644	49	4,695	0	21,748	29,136	-	-	-	-	-	-	-	-	-	-	-	-
1991	1,324	55	11,614	0	31,619	44,612	-	-	-	-	-	-	-	-	-	-	-	-
1992	1,098	56	14,660	0	27,867	43,681	-	-	-	-	-	-	-	-	-	-	-	-
1993	2,756	20	11,130	106,743	20,864	141,513	-	-	-	-	-	-	-	-	-	-	-	-
1994	885	8	22,065	502,231	5,411	530,600	1,175	1	2,777	9,133	1,221	14,307 ^d	2,060	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
5-year avg. ^a	1,304	1	7,003	115,706	6,604	130,618	1,067	570	2,486	6,507	2,004	12,633	2,371	571	9,489	122,213	8,608	143,251
10-year avg. ^b	1,523	19	9,918	118,750	14,053	144,263	-	-	-	-	-	-	-	-	-	-	-	-

^a 1995-1999^b 1990-1999^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, 1961-2000.

UNALAKLEET (SUBDISTRICT 6)																			
Year	Commercial						Subsistence						Combined						
	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	
1961	5,160	35	13,807	5,162	23,586	47,750	-	-	-	-	-	-	5,160	35	13,807	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 ^c	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 ^c	1,298	-	4,972	11,106	20,227	37,603	
1967	1,751	-	1,544	21,961	8,502	33,758	490	-	484	9,964	-	10,938 ^c	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	2,982	15,705 ^c	1,146	-	8,042	52,518	17,847	79,553	
1969	2,276	-	5,273	40,558	22,032	70,139	324	-	1,483	4,230	4,196	10,233 ^c	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 ^c	2,099	-	8,168	40,883	47,243	98,393	
1971	2,166	-	2,688	1,196	37,543	43,593	911	-	3,137	2,230	7,073	13,351 ^c	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 ^c	2,878	-	2,230	31,363	24,572	61,043	
1973	1,397	-	8,922	13,335	25,716	49,370	323	-	213	6,233	3,426	10,195 ^c	2,720	-	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	1,638	-	3,167	12,137	48,740	65,682	163	-	74	4,758	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	-	2,538	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	26,198	109,220	178,551	1,868	33	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	
1986	4,494	153	20,580	-	30,239	55,466	-	-	-	-	-	- ^d	-	-	-	-	-	-	
1987	3,246	141	15,097	97	17,525	36,106	-	-	-	-	-	- ^d	-	-	-	-	-	-	
1988	2,218	157	24,232	23,730	25,363	75,700	-	-	-	-	-	- ^d	-	-	-	-	-	-	
1989	4,402	222	36,025	-	20,825	61,474	-	-	4,681	17,500	1,388	- ^d	-	-	-	-	-	-	
1990	5,998	358	52,015	-	23,659	82,030	2,476 ^e	-	-	-	-	-	-	-	-	-	-	-	
1991	4,534	147	52,033	-	39,609	96,323	-	-	-	-	-	- ^d	-	-	-	-	-	-	
1992	3,409	229	84,449	6,284	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	31,280	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	
5-year avg. ^a	5,734	49	28,871	50,052	12,252	96,958	4,670	501	10,727	14,214	8,767	38,880	10,404	550	39,599	64,266	21,019	135,837	
10-year avg. ^b	5,295	130	43,016	77,876	21,752	148,070	-	-	-	-	-	-	-	-	-	-	-	-	

^a In-depth survey, Norton Sound Division.

^b Harvest estimate, Norton Sound Division, v. of Subsistence survey. Includes harvest in Stebbins and St. Michael.

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

^d Subsistence survey not conducted.

Appendix Table A8. Commercial and subsistence salmon catches by species, by year for all subdistricts in Norton Sound District, 1961-2000.

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	233,863	5	-	118	16,607	17,635	34,365	6,618	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	2,655	22,792	161,348	189,514	
1965	1,449	30	2,030	220	36,795	40,524	574	-	4,812	19,131	30,772	55,289	2,023	30	6,842	19,351	67,567	95,813	
1966	1,553	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	22,734	42,279	2,621	-	3,601	46,395	64,480	117,097	
1968	1,045	-	6,885	71,179	45,300	124,409	237	-	2,391	36,912	11,661	51,201	1,282	-	9,276	108,091	56,961	175,610	
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	64,908	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	7,234	15,758	152,980	179,778	
1972	2,938	-	454	45,182	100,920	149,494	804	93	2,319	14,158	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	2,951	-	2,092	148,519	162,267	315,829	420	-	1,064	16,426	3,958	21,868	3,371	-	3,156	164,945	166,225	337,697	
1975	2,393	2	4,593	32,388	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	2,243	11	6,934	87,919	95,956	193,063	203	-	1,004	18,048	7,718	26,973	2,446	11	7,938	105,967	103,674	220,036	
1977	4,500	5	3,690	48,675	200,455	257,325	846	-	2,530	14,296	26,607	44,279	5,346	5	6,220	62,971	227,062	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	31,562	232,479	169,708	441,734	2,021	38	13,416	28,741	32,866	77,082 ^c	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	18,580	88,460 ^c	6,903	18	106,302	284,530	201,915	599,668	
1983	10,308	27	49,735	76,913	319,437	456,420	-	-	-	-	-	- ^d	-	-	-	-	-	-	
1984	8,455	6	67,875	119,381	146,442	342,159	-	-	-	-	-	- ^d	-	-	-	-	-	-	
1985	19,491	166	21,968	3,647	134,928	180,200	-	-	-	-	-	- ^d	-	-	-	-	-	-	
1986	6,395	233	35,600	41,260	146,912	230,400	-	-	-	-	-	- ^d	-	-	-	-	-	-	
1987	7,080	207	24,279	2,260	102,457	136,283	-	-	-	-	-	- ^d	-	-	-	-	-	-	
1988	4,096	1,252	37,214	74,604	107,966	225,132	-	-	-	-	-	- ^d	-	-	-	-	-	-	
1989	5,707	265	44,091	123	42,625	92,811	-	-	-	-	-	- ^d	-	-	-	-	-	-	
1990	8,895	434	56,712	501	65,123	131,665	-	-	-	-	-	- ^d	-	-	-	-	-	-	
1991	6,068	203	63,647	-	86,871	156,789	-	-	-	-	-	- ^d	-	-	-	-	-	-	
1992	4,541	296	105,418	6,284	83,394	199,933	-	-	-	-	-	- ^d	-	-	-	-	-	-	
1993	8,972	279	43,283	157,574	53,562	263,670	-	-	-	-	-	- ^d	-	-	-	-	-	-	
1994 ^a	5,285	80	102,140	982,389	18,290	1,108,184	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 ^a	8,860	128	47,862	81,644	42,898	181,392	7,766	1,222	23,015	38,594	43,014	113,611	16,626	1,350	70,877	120,238	85,912	295,003	
1996 ^a	4,984	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 ^{a,d}	12,573	161	32,284	20	34,103	79,141	8,998	1,892	16,476	27,200	26,803	81,370	21,571	2,053	48,760	27,220	60,906	160,511	
1998 ^{a,d}	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 ^a	2,508	0	12,662	0	7,881	23,051	6,144	1,177	14,342	20,017	19,398	61,078	8,652	1,177	27,004	20,017	27,279	84,129	
2000 ^a	752	14	44,409	166,548	6,150	217,873	4,149	682	17,062	38,308	17,283	77,485	4,901	696	61,471	204,856	23,433	295,358	
5-year avg. ^a	7,271	59	38,127	231,424	22,363	299,244	7,692	1,337	19,829	40,494	28,766	98,118	14,962	1,397	57,956	271,917	51,129	397,362	
10-year avg. ^b	7,012	159	56,184	230,387	41,906	335,646	-	-	-	-	-	-	-	-	-	-	-	-	

^a 1995-1999

^b 1990-1999

^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, 1964-2000.

Year	Mean Round Weight in Pounds ^a			
	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

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

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

Appendix Table A10. Estimated mean prices paid to commercial salmon fishers, Norton Sound District, 1962 - 2000.

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	\$0.65	\$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

^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.

Appendix Table A11. Dollar estimates of Norton Sound District commercial salmon fishery, 1961 - 2000.

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	\$105,800.00	^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	\$308,740.00	\$81,000.00	\$15,400.00
1974	\$437,127.00	\$129,600.00	\$20,028.00
1975	\$413,255.00	\$172,800.00	\$28,230.00
1976	\$285,283.00	^a	\$10,133.00
1977	\$528,610.00	^a	\$11,386.00
1978	\$814,221.00	^a	\$12,002.00
1979	\$876,547.00	^a	\$11,780.00
1980	\$583,388.00	^a	\$11,640.00 ^c
1981	\$758,471.00	^a	\$11,940.00
1982	\$988,588.00	^a	\$7,155.00 ^{c,d}
1983	\$1,038,967.00	^a	\$10,700.00 ^c
1984	\$721,055.00	^a	\$9,690.00 ^c
1985	\$822,056.00	^a	\$5,820.00 ^c
1986	\$539,576.00	^a	\$5,970.00 ^c
1987	\$504,631.00	^a	\$5,940.00 ^c
1988	\$754,751.00	^a	\$10,050.00 ^{c,f}
1989	\$274,817.00	^a	\$10,300.00 ^c
1990	\$497,623.00	^a	\$10,350.00 ^c
1991	\$425,430.00	^a	\$10,250.00 ^c
1992	\$448,395.00	^a	\$10,200.00 ^c
1993	\$322,117.00	^a	\$8,835.00 ^c
1994	\$864,882.00	^a	\$10,000.00 ^c
1995	\$356,912.00	^a	\$5,250.00 ^c
1996	\$340,347.00	^a	\$4,300.00 ^c
1997	\$363,907.48	^a	\$5,100.00 ^c
1998	\$358,982.00	^a	\$4,100.00 ^c
1999	\$76,860.00	^a	\$3,000.00 ^c
2000	\$149,907.00	^a	\$3,950.00 ^c

^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, Norton Sound District, 1961 - 2000.

Year	Pounds Caught (Round Wt. in lbs)				Salmon Roe (lbs)
	Chinook	Coho	Pink	Chum	
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 ^c	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	177,569	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

^a Does not include canned salmon cases (48#)

1962: 29 chinook, 883 coho, 927 pink, 12459 chum

1963: 604 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 about 598 lbs. of salted chinook, about 48,092 lbs. of salted pink and about 117,664 lbs. salted chum.

Appendix Table A13. Commercial salmon catches by species, Norton Sound District, 1961-2000.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1961	5,300	35	13,807	34,327	48,332	101,801
1962	7,286	18	9,156	33,187	182,784	232,431
1963	6,613	71	16,765	55,625	154,789	233,863
1964	2,018	126	98	13,567	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	86,949	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	1,918	-	9,282	46,499	119,098	176,797
1974	2,951	-	2,092	148,519	162,267	315,829
1975	2,393	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	91,690	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	6,284	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	181,392
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
Previous 5-Yr Avg ^a	7,271	59	38,127		22,363	299,244
Previous 10-Yr Avg ^b	7,012	159	56,184	47,848	41,906	335,646

^a 1995-1999^b 1990-1999; odd years only for pink salmon

Appendix Table A14. Comparative salmon escapement indexes of Norton Sound streams, 1961-2000^a.

(Page 1 of 4)

Year	Sinuk River					Nome River					Flambeau River				
	Chinook	Chum	Pink	Pink & Chum ^b	Coho	Chinook	Chum	Pink	Pink & Chum ^b	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	-	4,662	5,390	-	-	1	2,161	3,405	-	-					
1976															
1977	-	5,207	1,302	-	-	5	3,046	1,726	-	-	-	375	1,994	-	-
1978	-	8,756	22,435	-	-	2	5,242	34,900	-	-	-	1,275	10	-	-
1979											-	7,110	-	-	-
1980	3	2,022	199,000	-	1,002	5	-	-	179,095	920	-	283	291	-	-
1981	-	5,579	350	-	-	15	1,195	12,565	-	-	-	-	-	29,190	-
1982	-	638	148,800	-	-	-	700	327,570	-	-	1	12,031	2,710	-	-
1983	48	2,150	10,770	-	96	2	198	9,170	-	96	1	5,097	25,001	-	-
1984	7 ^k	493 ^k	284,400 ^k	-	192	-	2,084 ^k	178,870	-	839	2	1,195	200	-	-
1985	4	1,910	8,860	-	33	7	1,967	2,250	-	242	1	3,150 ^k	20,200 ^k	-	-
1986	4	1,960	28,690	-	-	2	1,150	13,580	-	-	1	3,215	260	-	-
1987	5	4,540	30	-	230	3	1,646	1,400 ^k	-	419	2	3,075	300	-	-
1988	3	2,070	4,652 ^l	-	563	3	973	2,490 ^l	-	1,280 ^k	0	115	0	-	-
1989	-	1,025	26,850	-	75	3	72	1,365	-	375	3	765	10	-	-
1990	-	95	29,040	-	161	2	72	1,365	-	375	-	-	-	-	-
1991	3	5,420	14,680	-	701	-	541	13,085	-	617	2	1,564	570	-	-
1992	-	470	292,400	-	422	9	3,520	4,690	-	611	-	606	180	-	-
1993	7	1,570	5,120	-	104	3	813	255,700	-	691	3	813	255,700	-	-
1994	10	1,140	492,000	-	307	8	1,520	8,941	-	276 ^d	-	1,590	-	-	-
1995	-	3,110	1,250	-	290	2	350	265,450	-	631 ^d	1	4,960	290	-	-
1996	5	1,815	74,100	-	367	-	1,855	182	-	517	-	6,455	350	-	68
1997	-	2,975	1,200	-	57	-	799	34,520	-	723	-	5,390	-	-	-
1998	-	630	372,850	-	322	4	956	65	-	544	1	627	-	-	96
1999	-	1,697	180	-	217	3	335	179,680	-	515	1	2,828	7180	-	-
2000	-	10	12,608	-	912	-	375	345	-	620	-	55	-	-	-
						24	4051	41,850	-	1,135 ^d	-	819	640	-	11

^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 indexes of Norton Sound streams, 1961-2000^a.

(Page 2 of 4)

Year	Eldorado					Fish River					Boston Creek				
	Chinook	Chum	Pink	Pink & Chum ^b	Coho	Chinook	Chum	Pink	Pink & Chum ^b	Coho	Chinook	Chum	Pink	Pink & Chum ^b	Coho
1961						1	-	-	14,100	-					
1962						48	-	-	28,918	-					
1963						21	-	-	25,728	-	67	1,669	-	-	-
1964						-	18,670	10,935	14,550	-	10	3,315	-	-	-
1965															
1966						7	-	-	17,955	-	153	761	-	-	-
1967						20	-	-	13,610	-					
1968						10	-	-	164,000	-	7	2,500	2,500	-	-
1969						-	2,080	124,000	-	-	100	7,000	16,000	-	-
1970						33	76,550	198,000	-	-	246	8,200	12,900	-	-
1971						1	13,185	1,670	-	-	42	7,045	80	-	-
1972						-	3,616	13,050	-	-	57	4,252	3,950	-	-
1973						31	6,887	15,564	-	-	153	3,014	3,213	-	-
1974	13	2,143	6,185	-	-	7	10,945	15,690	-	-	231	2,426	749	-	-
1975						26	20,114	15,840	-	-	147	1,885	2,556	-	-
1976						1	8,390	15,850	8,550	-					
1977	-	1,835	125	-	-	9	9,664	2,430	-	-	76	1,325	385	-	-
1978	-	10,125	12,800	-	-	29	26,797	140,640	-	-	136	2,655	74,221	-	-
1979						11	6,893	9,132	-	-	58	882	271	-	-
1980	6	9,900	55,520	-	-	-	19,100	33,500	-	-	16	2,450	1,510	-	-
1981	-	15,605	495	-	-	90	24,095	450	-	-					
1982	2	1,095	163,300	-	-	-	-	-	241,700	-	10	1,730	22,020	-	-
1983	11	994	270	-	100	87	20,037	300	-	-	154	704	-	-	-
1984	14 ^c	4,361 ^e	1,924,935 ^e	-	261	42	-	-	293,245	-	35	-	-	47,850	-
1985	8	6,090	150	-	67	303	21,080	7,365	-	-	243	3,450	-	-	-
1986	9	3,490	18,200	-	-	200	25,190	140	-	-	2	220	0	-	-
1987	6	3,860	0	-	108	193	7,886	0	-	-	583	3,640	0	-	-
1988	17	2,645	1,045	-	78	36	1,240	29,950 ^f	-	-	163	1,040	7,400 ^f	-	-
1989	-	350	1,550	-	87										
1990	17	884	2,050	-	44							1,455	8,440	-	-
1991	76	5,755	1,590	-	98	58	10,190	51,190	-	-	152	2,550	3,210	-	-
1992	-	4,887	6,615	-	113	4	390	1,387,000	-	-	68	1,540	803,200	-	-
1993	38	2,885	120	-	110	48	12,695	13,440	-	-	227	4,513	1,930	-	-
1994	2	5,140	53,890	-	242	55	16,500	910,000	-	-	95	4,270	355,600	-	-
1995	-	9,025	50	-	247	40	13,433	780	-	1,829	78	4,221	-	-	230
1996	21	23,820	40,100	-	254	189	5,840 ^g	684,780	-	-	133	3,505 ^g	35,980	-	-
1997	40	5,967	10	-	37	110	19,515	800	-	465	452	4,545	-	-	-
1998	8	3,000	123,950	-	71	96	28,010	663,050	-	-	255	418	175,330	-	-
1999	-	1,741	6	-	45	-	50	20	-	821	-	-	-	-	319
2000	62	10,604	51,312	-	211 ^d	-	-	-	-	805	-	-	-	-	414

^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 indexes of Norton Sound streams, 1961-2000^a.

(Page 3 of 4)

Year	Niukluk River					Kwinik River					Tubutulik River				
	Chinook	Chum	Pink	Pink & Chum ^b	Coho	Chinook	Chum	Pink	Pink & Chum ^b	Coho	Chinook	Chum	Pink	Pink & Chum ^b	Coho
1961															
1962	11	-	-	27,879	-	3	-	-	23,249	-	3	-	-	16,690	-
1963	1	13,687	4,103	-	-	2	11,340	3,779	-	-	9	16,069	4,355	-	-
1964	-	8,395	10,495	-	-	-	14,533	-	-	-	-	15,469	10,043	3,420	-
1965	-	-	-	-	-	14	26,634	8,301	-	-	-	-	-	-	-
1966	-	21,300	8,600	4,700	-	7	32,786	10,629	-	-	-	5,514	26,000	-	-
1967	-	20,546	-	-	-	13	24,444	3,508	-	-	1	-	-	22,475	-
1968	-	-	-	87,085	-	27	18,813	126,764	-	-	-	-	-	-	-
1969	-	10,240	92,650	-	-	12	19,687	56,683	-	-	3	12,040	12,788	3,045	-
1970	-	7,300	60,350	-	-	-	68,004	235,131	-	-	-	53,290	136,590	-	-
1971	-	22,605	8,370	-	-	37	39,046	16,742	-	-	-	16,820	7,500	5,065	-
1972	-	10,500	22,600	-	-	65	30,686	62,461	-	-	-	8,070	21,100	-	-
1973	-	14,365	14,790	-	-	57	28,617	38,420	-	-	131	5,383	15,665	-	-
1974	1	8,720	8,915	-	-	62	35,899	40,816	-	-	136	9,560	17,940	-	-
1975	-	10,089	16,258	-	-	44	14,344	57,317	-	-	7	17,141	38,003	-	-
1976	-	4,130	7,190	-	-	12	6,977	29,471	-	-	-	1,095	6,095	2,600	-
1977	19	10,456	4,150	-	-	84	22,757	46,234	-	-	-	8,540	4,685	-	-
1978	2	14,365	208,300	-	-	74	14,408	72,270	-	-	2	5,865	1,364	-	-
1979	8	10,127	30,147	-	-	107	12,355	167,492	-	-	-	812	1,624	-	-
1980	-	8,915	75,770	-	-	177	19,374	320,389	-	-	405	21,616	663,937	-	-
1981	-	7,249	-	-	-	136	34,561	566,534	-	-	-	-	-	-	-
1982	20	2,557	227,540	-	-	138	44,036	469,674	-	-	49	2,044	53,605	-	-
1983	54	8,886	50	-	-	267	56,907	254,538	-	-	135	16,345	40,790	-	-
1984	6	-	-	57,208	3,072	736	54,043	663,533	-	983 ^f	139	56,210	93,600	-	-
1985	25	11,140	-	-	332 ^k	712	9,912	18,237	-	673 ⁱ	472	13,645	8,940	-	-
1986	2	2,442	0	-	-	653	24,704	241,446	-	421	453	5,975	35,680	-	-
1987	10	4,145	0	-	257 ^k	314	16,134	5,567	-	819 ⁱ	474	9,605	580	-	-
1988	18	6,501	8,160 ⁱ	-	1,095 ^k	321	13,301	187,991	-	444 ^f	561	4,660	114,450 ^h	-	-
1989	-	-	-	-	182	282	13,689	27,488	-	-	-	-	-	-	-
1990	-	6,200	-	-	170	744	13,735	416,512	-	746 ^f	397	4,350	186,400	-	-
1991	24	10,660	37,410	-	1,783	587	18,802	53,499	-	809 ^f	661	7,085	26,870	-	-
1992	-	7,770	803,200	-	812	479	12,077	1,464,717	-	532 ^f	260	2,595	138,600	-	-
1993	15	19,910	2,840	-	2,104	565	15,823	43,065	-	1,238 ^f	1,061	8,740	18,650	-	1,395
1994	7	16,470	1,294,100	-	274	627	33,010	2,306,481	-	2,841 ^f	No survey due to poor conditions				
1995	48	25,358	200	-	2,136	468	42,161	17,509	-	1,625 ^f	377	16,158	4,020	-	930
1996	25	9,732 ⁱ	153,150	-	2,047	567	27,256	907,894	-	1,410 ^f	439	10,790	226,750	-	-
1997	131	16,550	-	-	983	972	20,118	9,536	-	610 ^f	1,946	3,105	16,890	-	-
1998	51	2,556	205,110	-	593	296	24,248	655,933	-	610 ^f	894	10,180	112,480	-	-
1999	-	640	-	-	619	114	8,342	607	-	223 ^f	-	-	-	-	-
2000	53	26,724	945,354	-	10,064	144	12,251	750,173	-	541 ^f	-	-	-	-	0

^a Represents "high count" for season.^b Surveyer 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.

North River					
Year	Chinook	Chum	Pink	Pink & Chum ^b	Coho
1961					
1962	162	-	-	16,087	-
1963 ^c	287	-	-	73,274	-
1964	23	-	-	5,981	-
1965	153	-	-	16,600	-
1966					
1967					
1968					
1969					
1970 ^d	1	20,655	12,400	-	-
1971 ^e	256	-	-	1,047	-
1972 ^d	561	2,332	54,934	-	-
1973 ^d	298	4,332	26,542	-	-
1974 ^d	220	861	154,285	-	-
1975 ^d	60	5,237	17,885	-	-
1976 ^d	66	196	10,606	-	-
1977	1,275	8,139	4,565	-	-
1978	321	9,349	21,813	-	-
1979	735	1,130	9,500	-	-
1980	61	2,300	127,900	-	204
1981	68	405	575	-	263
1982	8	599	173,352	-	4,145
1983	347	4,135	4,980	-	-
1984 ^d	2,844	2,915	458,387	-	152 ^f
1985 ^d	1,426	4,567	4,360	-	2,045
1986 ^d	1,613	3,738	236,487	-	-
1987	445	392	0	-	680
1988	202	30	112,770 ^g	-	240
1989 ^d					
1990	255	510	25,685	-	-
1991	656	2,435	118,720	-	2,510
1992	329	-	631,140	-	398
1993	900	445	13,570	-	1,397
1994	No survey due to poor conditions				
1995	622	1,370	18,300	-	690 ^h
1996	106	220 ⁱ	125,500	-	917
1997	1,605	9,045	17,870	-	-
1998	591	50	153,150	-	233
1999	18	1,480	3,790	-	533
2000	852	3,717	64,777	-	4,713

^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 B1. Subsistence surveys conducted in Port Clarence District 1963 - 2000.

Year	Number of Fishing Families Interviewed	Chinook	Sockeye	Coho	Pink	Chum	Total
1963	19	9	4,866	25	1,061	1,279	7,240
1964	22	17	1,475	227	371	1,049	3,139
1965	29	36	1,804	639	1,854	1,602	5,935
1966	26	10	1,000	896	859	2,875	5,640
1967	19	12	2,068	232	767	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	-	7,783	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	2,587	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

^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 -2000.

Year	Salmon	Grand Central	Total
	Lake	River	
1963	866	620	1,486
1964 ^c	76	590	666
1965	250	160	410
1966	1,120	370	1,490
1967	129	280	409
1968 ^c	830	645	1,475
1969	24	171	195
1970 ^a	-	-	-
1971	538	512	1,050
1972 ^c	680	300 ^b	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 ^c	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	^a	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	^a	12,772

^a No survey made.

^b Boat survey.

^c Poor survey.

^d Early count

Appendix Table C1. Kotzebue District chum salmon catch statistics 1962-1999 and 2000.

Year	Total Catch	Total Days ^a	Boat Days ^b	Catch/Boat Day	Number Fisherman ^c	Season Catch per Fisher
1962	129,948	21.0	793	164	84	1,547
1963	54,445	20.0	693	79	61	893
1964	76,449	27.0	560	137	52	1,470
1965	40,025	32.0	410	98	45	889
1966	30,764	35.0	548	56	44	699
1967	29,400	33.0	556	53	30	980
1968	30,212	34.0	858	35	59	512
1969	59,335	40.0	798	74	52	1,141
1970	159,664	32.0	1,368	117	82	1,947
1971	154,956	29.0	1,468	106	91	1,703
1972	169,664	35.0	2,095	81	104	1,631
1973	375,432	25.0	2,217	169	148	2,537
1974 ^d	627,912	32.0	3,769	167	185	3,394
1975 ^e	563,345	39.0	4,301	131	267	2,110
1976	159,796	16.0	2,236	71	220	726
1977	195,895	21.0	2,353	83	224	875
1978	111,494	23.0	2,738	41	208	536
1979	141,623	21.0	2,462	58	181	782
1980	367,284	27.0	2,559	144	176	2,087
1981	677,239	27.0	3,336	203	187	3,622
1982	417,790	23.5	3,115	134	199	2,099
1983	175,762	12.5	1,557	113	189	930
1984	320,206	19.5	2,432	132	181	1,769
1985	521,406	25.5	3,376	154	189	2,759
1986	261,436	15.5	2,049	128	187	1,398
1987	109,467	11.5	1,160	94	160	684
1988	352,915	21.5	2,761	128	193	1,829
1989	254,617	22.2	1,961	130	165	1,543
1990	163,263	11.5	1,760	93	153	1,067
1991	239,923	22.5	1,795	134	142	1,690
1992	289,184	17.0	1,513	191	149	1,941
1993 ^f	73,071	7.0	431	170	114	641
1994 ^g	153,452	9.8	426	360	109	1,408
1995	290,730	9.7	282	1031	92	3,160
1996 ^h	82,110	6.0	76	1080	55	1,493
1997	142,720	16.5	330	432	68	2,099
1988	55,907	13.0	187	300	45	1,242
1999	138,605	12.0	212	654	60	2,310
Average	215722.3	22.3	1619.5	198.0	130.3	1582.7
2000	159802.0	14.0	554.9	288.0	64.0	2496.9

a Day = 24 hours of open fishing time.

b Boat days standardized in 1983 for all prior years. Boat days = number of boats fishing times period length in hours divided by 24. Total boat days = total season boat hours divided by 24.

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

d Includes 6,567 chum salmon from the Deering experimental fishery.

e Includes 10,704 chum salmon from the Deering experimental fishery.

f Includes 2,000 chum salmon from the Sikusuiiaq springs Hatchery terminal fishery.

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

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

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

Appendix Table C2. Kotzebue District chum salmon type of processing and weights, 1962-2000.

Year	Chum Salmon		Other Species ^a	Fresh Frozen Salmon Roe (pounds)	Cured Pounds
	Cases (48lbs)	Fresh Frozen (Round weight in 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		

^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 Commercial Fishery Dollar Value Estimates, 1962-2000.^a

Year	Gross Value of Catch to Fishermen
1962	\$4,500
1963	\$9,140
1964	\$34,660
1965	\$18,000
1966	\$25,000
1967	\$28,700
1968	\$46,000
1969	\$71,000
1970	\$186,000
1971 ^b	\$200,000
1972 ^c	\$260,000
1973	\$925,000
1974	\$1,822,784
1975	\$1,365,648
1976	\$580,375
1977	\$1,033,950
1978	\$575,260
1979	\$990,263
1980	\$1,446,633
1981	\$3,246,793
1982	\$1,961,518
1983	\$420,736
1984	\$1,148,884
1985	\$2,137,368
1986	\$931,241
1987	\$515,000
1988	\$2,581,333
1989	\$613,823
1990	\$438,044
1991	\$437,948
1992	\$533,731
1993 ^d	\$235,061
1994	\$233,512
1995	\$316,031
1996	\$56,310
1997	\$187,978
1998	\$70,587
1999	\$179,781
10 year Average	\$268,898
2000	\$246,786

^a Some estimates between 1962 and 1981 only include chum value which represent over 99% of the total value. Values after 1981 represent the chum value as well as incidental species such as char, whitefish and other salmon.

^b Includes \$9,193 from the experimental commercial fishery at Deering.

^c Includes \$17,776 from the experimental commercial fishery at Deering.

^d Includes \$3,648 from Sikusuilag Springs Hatchery terminal fishery.

Appendix Table C4. Kotzebue District mean prices paid per pound to salmon fishermen by species, 1962-2000^a

Year	Chum Salmon		Chinook Salmon	Pink Salmon	Inconnu	Dolly Varden
	Average Weight	Average Price				
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

^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 C5. Kotzebue District commercial and subsistence salmon catches, 1914-2000.

Year ^a	Commercial Catch			Subsistence Chum Catch			Total Documented Catch
	Chum ^b	Other ^c	Total	Chum	Number of Fishermen Interview	Average Catch per Fishermen	
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 ^d			
1962	129,948		129,975	70,283	81	868	200,258
1963	54,445	143	54,588	31,069	67	464	85,657
1964	76,499	5	76,504	29,762	58	513	106,266
1965	40,034		40,034	30,500	89	343	70,534
1966	30,764	1	30,765	35,588	121	294	66,353
1967	29,400		29,400	40,108	135	297	69,508
1968	30,384 ^e		30,384	20,814	65	320	51,198
1969	59,335	48	59,383	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	3	169,667	11,085	96	115	180,752
1973	375,432	5	375,437	18,942	101	188	394,379
1974	634,479 ^f	48	634,527	26,729	88	304	661,256
1975	563,682 ^g	36	563,718	27,605	95	291	591,323
1976	159,796	2	159,798	15,765	91	173	175,563
1977	195,895		195,895	9,752	83	117	205,647
1978	111,494	7,007	118,501	12,864	85	151	131,365
1979	141,623	910	142,533	14,605	97	151	157,138
1980	367,284	1,654	368,938	10,945	111	99	379,883
1981	677,239	237	677,476	17,766	71	250	695,242
1982	417,790	57	417,847	30,133	204	148	447,980
1983	175,762	229	175,991	8,262 ^h	46	180	184,253
1984	320,206	107	320,313	15,508 ^h	66	235	335,821
1985	521,406	63	521,469	13,494 ⁱ	243	56	534,963
1986	261,436	106	261,542	36,311	837	43	297,853
1987	109,467	44	109,511	j	j	j	109,511
1988	352,915	152	353,067	j	j	j	353,067
1989	254,617	87	254,704	j	j	j	254,704
1990	163,263	32	163,295	j	j	j	163,295
1991	239,923	44	239,967	j	j	j	239,967
1992	289,184	204	289,388	j	j	j	289,388
1993	73,071 ^k	131	73,202	j	j	j	73,202
1994	153,452 ^l	3	153,455	36,226 ^m	375	97	189,681
1995	290,730	5	290,735	102,880	593	173	393,615
1996	82,110 ⁿ	3	82,113	99,740	596	167	181,853
1997	142,720	45	142,765	57,906	530	109	200,671
1998	55,907	210	56,117	48,979	592	83	105,096
1999	139,120	5	139,125	94,342	353	267	233,467
2000	159,802	10	159,812	65,975	422	156	225,787
1979-2000 Average	244,956	197	245,153	1994-2000 Average	494	150	

^a There was no commercial fishing during 1919-1961.^b Catches for 1914-1918 are from pack data only. Number of chum salmon estimate at 9.5 per case (#48) and 34 per barrel.^c Includes pink, chinook, and sockeye salmon.^d Estimated mean annual catches prior to 1957 (study by Raleigh).^e Corrected from 1968 annual report due to addition of late catches.^f Includes 6,567 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 Noatak and Kivalina.^j Not surveyed.^k Includes 2,000 chum salmon from the Sikusuilag Springs Hatchery terminal fishery.^l Includes 4,000 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 Kotzebue.

Appendix Table C6. Kotzebue District subsistence chum salmon catches by village, 1962-2000.

Year	Village							Village						District Total
	Noorvik	Kiana	Ambler	Shungnak	Kobuk River Villages	Noatak Village	Kotzebue	Deering	Kivalina	Buckland	Candle	Shishmaref		
1962	15,934	3,139	^b	^b	2,321	21,394	48,890							70,284
1963	4,304	1,973	755	1,240	200	8,472	16,762	5,835	^b	^b	^b	^b	^b	31,069
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	2,838	^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 ^{ac}
1982	7,433	4,918	2,506	4,191	600	19,648	5,479	4,099	807	210	^b	^b	^b	30,243 ^b
1983 ^{ad}	277	223	1,062	3,556	368	5,486	4,035	347	219	200	^b	^b	^b	10,287
1984 ^{ae}	^b	^b	2,990	4,241	^b	7,231	6,049	88	1,940	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	50,458
1987	5,092	^b	^b	1,975	^b	7,067	2,921	^b	^b	^b	^b	^b	^b	9,988
1988	7,500	^b	^b	6,223	^b	13,723	^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

^a No household survey, information is from return of mail questionnaires.^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 questionnaires.

Appendix Table C7. Kotzebue District mean subsistence chum salmon catch per fisher by village, 1962-2000.

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	93	33	71	64	10	^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, fishers were just beginning to fish.

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

Appendix Table C8. Chum salmon aerial survey counts for the Kotzebue District, 1962-2000 ^{a,b}. (p. 1 of 5)

Stream	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 ⁱ	68 ⁱ	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 ^e	2,750	1,474	2,495	2,370	7,500 ^c	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
Kobuk River System Total	38,835 ^c	8,940	28,032	11,480	8,164	8,112 ^c	13,306	16,934	2,000 ^b

(continued)

Stream	1971	1972 ^b	1973 ^b	1974	1975	1976	1977 ^b	1978	1979	1980
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	164,474
Eli River		3,286		22,249	1,302	1,205	742	5,525	1,794	10,277
Kelly River & Lake			2,590 ⁱ	1,381 ⁱ	3,937	217 ^b	290 ^b	168 ^b	3,200 ^b	7,416
Noatak River System Total	41,056	64,315^b	34,734	153,270	101,748	45,996	12,253^b	43,510	20,715	182,167
Kobuk Drainage										
Kobuk to Pah River	4,953			2,255	1,873	485		269	75	1,694
Pah River to just below Selby River	2,039	1,865		4,710	3,968	2,037		1,448	183	2,069
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 [*]	4,861 [*]			53	640	6,925 ^d
Beaver Creek mouth	2,000	3,000	850							784
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	11,472
Squirrel River	6,628	32,126	12,345	32,523	32,256	7,229	1,964 ^b	1,863 ^b	1,500 ^b	13,563
Salmon River	5,453	2,073 ^b	6,891	29,190	9,721	1,161		814 ^b	674 ^b	8,456
Tutuksuk River	1,384 ⁱ			8,312	1,344 ^b	758		368 ^b	382 ^b	1,165
Kobuk River System Total	30,667	52,354	21,706	98,145	54,023	11,670	1,964	5,026	4,564	34,656

(continued)

Appendix Table C8. (p. 3 of 5)

Stream	1981 ^b	1982 ^b	1983	1984	1985 ^b	1986 ^b	1987 ^b	1988 ^b	1989 ⁱ	1990 ^b
Noatak Drainage										
Noatak River below Kelly River	116,352	20,682	79,773	67,873	45,525	37,227	5,515 ^{h,j}	45,930 ^{h,j}		23,345 ^b
Eli River		189	3,044	5,027	855	4,308	2,780	8,639		3,000
Kelly River & Lake	13,770	11,604	12,137	3,499	1,200	839	950	1,460		325 ⁱ
Noatak River System Total	130,122	32,475	94,954	76,399	47,580	42,374	9,245	56,029		26,670
Kobuk Drainage										
Kobuk to Pah River	18	2,643 ^b	2,147	402	2,048 ⁱ	531				4,610
Pah River to just below Selby River	309	598 ^b	2,433	257	241 ⁱ	511	2,250	1,135 ^b		305
Selby River mouth & slough	8,321 ^{da}	2,454	11,683		711 ⁱ	673	1,470	820 ^b		420
Selby R. mouth to Beaver C.		7,268	13,011	5,910	3,278 ⁱ	3,282	1,350	6,890 ^b		7,505
Beaver Creek mouth		1,711	3,059							
Above Beaver Creek			1,413	4,052		1,018	3,140	3,050 ^b		2,515
Upper Kobuk River Total	8,648	14,674	33,746	10,621	6,278	6,015	8,210	11,895 ^b		15,355
Squirrel River	9,854	7,690	5,115	5,473	6,160	4,982	2,708 ^c	4,848 ^b		5,500
Salmon River	4,709	1,821 ^c	1,677	1,471	2,884	1,971	3,333	6,208		6,335
Tutuksuk River	1,114	1,322	2,637	1,132	5,098	4,257	206	3,122		2,275
Kobuk River System Total	24,325	25,507	43,175	18,697	20,420	17,225	14,457	26,073		29,465

(continued)

Stream	1991	1992 ^b	1993	1994 ⁱ	1995	1996	1997	1998	1999	Aerial Escapement Goals
Noatak Drainage										
Noatak River below Kelly River	82,750	34,335	25,415		147,260	306,900				
Eli River	2,940	701	4,795		7,860	30,040				
Kelly River & Lake	654	726	9		8,384	1,427	2,792	2,631		
Noatak River System Total	86,344	35,762	30,219		163,504	338,367			84,085	84,000
Kobuk Drainage										
Kobuk to Pah River	9,840	1,030	3,896		12,190	20,700	2,248 ^b			
Pah River to just below Selby River	2,780	3,820	1,535		4,537	4,600	404 ^b			
Selby River mouth & slough	1,040	1,500	1,800		1,250	4,100	662 ^b			
Selby River	1,460	868	824		3,364	14,950	853 ^b	730		
Selby R. mouth to Beaver C.	5,250	3,845	929		10,898	15,480	2,582 ^b			
Beaver Creek mouth							914 ^b			
Above Beaver Creek	4,155	740	3,174		3,486	14,940	850 ^b			
Upper Kobuk River Total	24,525	11,803	12,158		35,725	74,770	8,513^b		27,340	10,000
Squirrel River	4,606	2,765	4,463		10,605	10,740	4,779 ^b		13,513	11,500
Salmon River	5,845	1,345	13,880		13,988	23,790	1,181 ^b		4,989	7,000
Tutuksuk River	744	1,162	1,196		3,901	21,805	163 ^b		2,906	2,000
Kobuk River System Total	35,720	17,075	31,697		64,219	131,105			48,748	30,500

(continued)

Stream	2000 ^k	Aerial Escapement Goals
Noatak Drainage		
Noatak River below Kelly River		
Eli River		
Kelly River & Lake		
Noatak River System Total		84,000
Kobuk Drainage		
Kobuk to Pah River		
Pah River to just below Selby River		
Selby River mouth & slough		
Selby River		
Selby R. mouth to Beaver C.		
Beaver Creek mouth		
Above Beaver Creek		
Upper Kobuk River Total		10,000
Squirrel River		11,500
Salmon River		7,000
Tutuksuk River		2,000
Kobuk River System Total		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.

^k No surveys flown in 2000.

Appendix Table D1. Norton Sound herring and spawn-on-kelp harvests
(in short tons) by U.S. commercial fishermen, 1909-2000.

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
1982	3,864	69	3,933	38
1983	4,181	401	4,582	29
1984	3,298	274	3,572	19
1985	3,420	128	3,548	-
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
1999	2,693 ⁱ	53	2,761	4
2000	4,487 ^k	-	4,487	2

^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 *Macrocystus* 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 50 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. Herring biomass estimate and commercial fisheries data for the Norton Sound District, 1980 - 2000.

Year	Biomass ^a (st)	Sac roe & Bait Harvest (st)	Kelp Harvest (pounds)	Percent ^c Exploitation	Roe % (Sac roe only)	Dollar Value (millions)	Number of Fishers
1980	8,400 ^d	2,452	48,000	29.2	8.1	0.5	294
1981	25,100	4,371	94,000	17.3	8.8	1.5	332
1982	17,400 ^d	3,933	76,000	22.6	8.8	1	237
1983	28,100	4,582	58,000	16.3	8.6	1.4	272
1984	23,100	3,662 ^e	38,000	15.8	10.3	0.9	194
1985	20,000	3,548		17.7	9.9	1.4	277
1986	28,062	5,194		18.5	9.6	2.9	323
1987	32,370	4,082		12.6 ^f	8.6	2.6	564
1988	33,924	4,672		13.8 ^g	9	3.9	348
1989	23,857	4,771 ⁱ		20 ^h	9.2	2.3	357
1990	35,522 ^h	6,439 ^j		18	8.7	3.6	365
1991	42,854	5,796 ^k		13.5 ^f	9.3	2.4	279
1992 ^m	57,974	0		0		0	0
1993	46,549	5,034 ⁱ		10.9	9.9	1.5	264
1994	37,829	960		2.5	10.3	0.3	215
1995	37,778	6,773		18	10.4	4.2	215
1996	26,596	6,220 ⁿ		23.4	10.6	4.5	287
1997	47,748	3,976 ^o		8.3	9.9	0.6	220
1998	52,033	2,631	18,083 ^p	5.1	9.2	0.2	47 ^q
1999	34,314	2,751 ^o	7,482	8	10.5	0.6	122 ^r
2000	32,680	4,487 ^s	4,500	13.7	9.4	0.8	97 ^t

^a Methods of calculating biomass have varied over the years. Biomass estimates listed follow methods used during the year.

^b Includes both bait and sac roe harvests.

^c Represents total District exploitation. During many years southern subdistricts are closed because exploitation of the local biomass reaches 20%, while northern subdistricts have remained open because little or no harvest has occurred.

^d Minimal biomass estimates due to poor survey conditions.

^e Includes an estimated 90 st of wastage.

^f Peak estimate made after the commercial fishery; the fishery was not re-opened due to the high probability of spawnouts present after two consecutive days of heavy spawning.

^g Peak biomass was sighted prior to arrival of the commercial buying fleet.

^h Biomass spotting conditions very poor throughout herring season; peak biomass represents minimum estimates; exploitation rate based on observed biomass.

ⁱ Includes an estimated 30 st of wastage.

^j Includes an estimated 60 st of wastage.

^k Includes an estimated 125 st of wastage.

^l Does not include an estimated 45 st of wastage.

^m No herring fishery occurred in 1992.

ⁿ Includes an estimated 50 st of wastage.

^o Includes an estimated 5 st of wastage.

^p Includes 2,100 lbs of wild kelp and 16,083 lbs of *Macrocystis* kelp.

^q Includes 35 sac roe fishers, 1 bait fisher and 11 kelp fishers.

^r Includes 119 sac roe fishers, 1 bait fisher and 2 kelp fishers.

^s Includes an estimated 15 st of wastage.

^t Includes 91 gillnet fishers, 3 beach seiners and 3 kelp fishers.

Appendix Table D4. Norton Sound commercial herring harvest (st) by subdistrict, by year, 1979 - 2000.^a

Year	Subdistricts							Totals
	s.d. 1	s.d. 2	s.d. 3	s.d. 4	s.d. 5	s.d. 6	s.d. 7	
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 ⁱ	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					4,471

^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.

Appendix Table E1. Historical commercial summer harvest of red king crab from Norton Sound Section, Eastern Bering Sea, by statistical areas, 1977-2000(catch in pounds).^a (page 1 of 2)

Statistical Area	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
616331	7,893												
616401													
626331	40,020					22							
626401	31,572			4,830	399								
626402	38,995												
636330													
636401				12,398	61,823	32,246	5,880	41	891				22,030
636402													
646301													
646330					4,716								5,212
646401			155,972		1,319	17,532							
646402	80,969					748							
656300			161,699		15,174								
656330			323,518	72,735	395,662	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	306,302	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

^a No commercial fishery occurred in 1991.

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

Appendix Table E1. Historical commercial summer harvest of red king crab from Norton Sound Section, Eastern Bering Sea, by statistical areas, 1977-2000 (catch in pounds).^a (page 2 of 2)

Statistical Area	1990	1991	1992	1993	1994	1995	1996 ^b	1997	1998	1999	2000	Totals
616331					48					633	4,557	13,131
616401						35						35
626331							61					40,103
626401						18,971	45,045	18,066	8,065	508	4,689	132,145
626402												38,995
636330							4,560	3,838	2,449			10,847
636401			1,159	1,373	8,087	24,329	70,677	59,206	10,771	14,201	126,994	452,106
636402					1,754	3,466						5,220
646301						4,628	13,888					18,516
646330						1,493	2,894	314		3,021		17,650
646401				1,963	37,222	105,045	22,834	1,052	3,194	221		346,354
646402				730	143,511	66,821						292,779
656300												176,873
656330			4,814	265		19,745	15,446	4,661	4,078	1,300		1,078,456
656401	171		53,119	105,341	29,566	32,289	9,985	4,035	1,127	2,739	94,813	1,807,959
656402				193,079	106,053	44,000						1,167,701
666230												55,567
666300							25,519					347,800
666330	27,185		4,305	31,758		730					5,839	1,535,286
666401	162,263		10,632	746	396		3,001	1,816		930	60,762	2,616,579
666402				535	1,221							1,298,666
666431						1,124						147,153
676300							546					140,015
676330												158,598
676400	3,212						9,775					807,867
676430												21,177
676501												36
686330												1,860
Totals	192,831		74,029	335,790	327,858	322,676	224,231	92,988	29,684	23,553		12,431,820

No Fishery

Appendix Table E2. Percentage of recruit and postrecruit male red king crab from summer commercial fishery catch samples Norton Sound Section, Bering Sea, 1977-2000.

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

^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 harvest, effort and value, Norton Sound Section, Eastern Bering Sea, 1977 - 2000.

Year	Guideline Harvest Level (lbs) b	Legal Male Pop. Est. (lbs) b	Commercial Harvest (lbs) ^{a,b}		Number of			Number of Pots		Exvessel Price/lb	Fishery Value (millions \$)	Season Length	
			Open Access	CDQ	Vessels	Permits	Landings	Registered	Pulls			Days	Dates
1977	^d	1.7	0.52		7	7	13	^d	5,457	0.75	0.229	60	^d
1978	3.00	7.7	2.09		8	8	54	^d	10,817	0.95	1.897	60	6/7-8/15
1979	3.00	0.8	2.93		34	34	76	^d	34,773	0.75	1.878	16	7/15-7/31
1980	1.00	1.9	1.19		9	9	50	^d	11,199	0.75	0.890	16	7/15-7/31
1981	2.50	1.3	1.38		36	36	108	^d	33,745	0.85	1.172	38	7/15-8/22
1982	0.50	0.9	0.23		11	11	33	^d	11,230	2.00	0.405	23	8/9-9/1
1983	0.30	0.9	0.37		23	23	26	3,583	11,195	1.50	0.537	3.8	8/1-8/5
1984	0.40	0.9	0.39		8	8	21	1,245	9,706	1.02	0.395	13.6	8/1-8/15
1985	0.45	1.1	0.43		6	6	72	1,116	13,209	1.00	0.427	21.7	8/1-8/23
1986	0.42	1.1	0.48		3	3	^d	578	4,284	1.25	0.600	13	8/1-8/25 ^c
1987	0.40	1.1	0.33		9	9	^d	1,430	10,258	1.50	0.491	11	8/1-8/12
1988	0.20	1.0	0.24		2	2	^d	360	2,350	^d	^d	9.9	8/1-8/11
1989	0.20	1.0	0.25		10	10	^d	2,555	5,149	3.00	0.739	3	8/1-8/4
1990	0.20	1.0	0.19		4	4	^d	1,388	3,172	^d	^d	4	8/1-8/5
1991 ^c	0.34	1.3											
1992	0.34	1.3	0.07		27	27	^d	2,635	5,746	1.75	0.130	2	8/1-8/3
1993	0.34	1.3	0.33		14	20	208	560	7,063	1.28	0.430	52	7/1-8/28 ^f
1994	0.34	1.3	0.32		34	52	407	1,360	11,729	2.02	0.646	31	7/1-7/31
1995	0.34	1.3	0.32		48	81	665	1,900	18,782	2.87	0.926	67	7/1-9/5
1996	0.34	0.5	0.22		41	50	264	1,640	10,453	2.29	0.519	57	7/1-9/3 ^g
1997	0.08	0.5	0.09		13	15	100	520	2,982	1.98	0.184	44	7/1-8/13 ^h
1998	0.08	0.5	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	0.02	0.00	10	9	53	360	1,630	3.08	0.073	66	7/1-9/4 ^j
2000	0.33	4.2	0.29	0.01	14	17	185	560	6,121	2.29	0.715	60	7/1 - 9/29 ^k

^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 closed 8/29/00. CDQ fishery ran 9/1/00-9/29/01.

Appendix Table E4. Winter commercial and subsistence red king crab harvests, Norton Sound, Eastern Bering Sea, 1978 - 2000.

Commercial			Subsistence						
Year ^a	Fishers	# Crab Harvested	Winter ^b	Permits Issued	Permits Returned	Permits Fished	Total Crab Caught ^c	Total Crab Harvested ^d	Average Harvest/fm
1978	37	9,625	1977-78	290	206	149	^e	12,506	84
1979	1	221	1978-79	48	43	38	^e	224	6
1980	1	22	1979-80	22	14	9	^e	213	24
1981	0	0	1980-81	51	39	23	^e	360	16
1982	1	17	1981-82	101	76	54	^e	1,288	24
1983	5	549	1982-83	172	106	85	^e	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
Avg 1978-1999	10	2,365	Avg 1984-1999	125	99	78	9,055	6,273	76

^a Prior to 1985 the winter commercial fishery occurred from January 1 - April 30; As of March 1985, the winter commercial harvest 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.

^e Data unavailable.

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

Year	Date	Research Agency	Gear	Population Abundance Estimates (Number of crab)		
				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
1979 ^e	7/26 - 8/5	NMFS	Trawl			809,799
1980 ^d	7/4 - 7/14	ADF&G	Pots			1,900,000
1981	6/28 - 7/14	ADF&G	Pots			1,285,195
1982	7/6 - 7/20	ADF&G	Pots			353,273
1982	9/5 - 9/11	NMFS	Trawl	356,724	832,581	877,722
1985	7/1 - 7/14	ADF&G	Pots			907,579
1985	9/16 - 10/1	NMFS	Trawl	466,858	707,140	1,051,857
1988	8/16 - 8/30	NMFS	Trawl	565,255	493,030	978,748
1991	8/22 - 8/30	NMFS	Trawl	294,801	303,682	1,287,486
1996	9/7 - 9/18	ADF&G	Trawl	452,580	325,699	536,235
1999	7/28 - 8/7	ADF&G	Trawl	103,832	940,198	1,594,341

^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, Bering Sea, 1983-2000.^a

Year	SUBLEGAL			LEGAL		
	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

^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 F1. Kotzebue District winter commercial sheefish harvest statistics, 1967- 2000.^a

Year ^b	No. of Fishers	No. of Fish	Pounds		Price/ Pound	Estimated Value
			Total	Average		
1967 ^c		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	^c	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						

^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, 1966-2000. ^a

Year	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

^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.

Appendix Table F3. Peak annual aerial survey counts of sheefish in the Kobuk and Selawik Rivers, 1966-2000. ^a

Year	Abundance Estimate for			Total
	Kobuk River	Kobuk River spawning area ^c	Selawik River	
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	

^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 F4. Kotzebue District incidentally caught and sold Dolly Varden during the commercial salmon fishery, 1966-2000.

Year	Number of Fish Sold	Estimated Total Catch ^a	Pounds Sold	Average Weight ^d	Average Price
1966	3,325				0.55 ^f
1967	367		2,606	7.1	0.11
1968	3,181		21,949	6.9	0.14
1969	1,089 ^a				2.84 ^f
1970	2,095				
1971	3,828 ^b		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 ^c		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 ^c		16	5.3	0.17
1982	3,447		23,648	6.9	0.20
1983	190 ^c	845	1,108	5.8	0.20
1984	347 ^c	1,090	2,104	6.1	0.25
1985	454	3,600	3,177	7.0	0.25
1986	5 ^c	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	3,320	^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

^a Includes 269 taken by permit.

^b Includes 179 taken by permit.

^c Includes 234 taken during commercial sheefish fishery.

^d Some data extrapolated from average reported weight.

^e Limited Dolly Varden market; many fish were taken home or dumped.

^f Price per fish.

^g Estimate includes fish caught but not sold based on interviews of fishers.

^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, 1959-2000.

Year	Kivalina		Noatak
	Number	Pounds	Number ^d
1959 ^a	34,240	85,600	
1960 ^a	49,720	124,300	
1962			27,623
1963			4,130
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 ^b			
1979 ^c	14,600		9,060
1980			7,220
1981	15,000-18,000		3,056
1982	18,438 ^c		2,676 ^{b,f}
1983	16,270 ^c		4,545
1984	12,000 ^c		2,542
1985	10,500 ^c		
1986	7,436 ^c		46 ^h
1987 ^g			1,376 ^h
1988			
1989			
1990			
1991 ^g			4,814
1992 ^g			4,395
1993 ^g			4,275
1994			
1995 ^g			5,762
1996 ^g			5,031
1997 ^g			4,763
1998 ^g			3,872
1999 ⁱ			
2000 ^h			3,315

^a From Saario, Doris J. and Brian Kessel. 1966. Environment of Cape Thompson Region, Alaska. U.S. Atomic Commission.

^b Storm and ice conditions prevented fall harvest.

^c Harvest data from Division of Sport Fish surveys.

^d No data available on poundage.

^e Harvest data from Stephen Braund and Associates.

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

^g ADF&G, Div. of Subsistence, household surveys in Noatak.

^h Subsistence fishers just beginning to beach seine at the time of this survey.

ⁱ Data not collected

Appendix Table F6. Aerial survey counts of overwintering and spawning Dolly Varden in the Kotzebue District 1968-2000^a

Year	Noatak River Spawner Survey ^b	Overwintering	
		Wulik River ^c	Kivalina River ^d
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 ^c	^d	^d
1984	9,130	30,923	5,474
1985	10,979		
1986	^f	5,590	5,030
1987	^f	^f	^f
1988	^f	80,000 ^c	^f
1989	^f	56,384	^f
1990	7,261	^f	^f
1991	9,605	126,985	35,275
1992	^f	135,135	^d
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 ^g	70,704	^f
2000	^f		^f

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

^b Includes spawner counts on the Kelly, Kugurorok and Nimiuktuk Rivers, and tributaries of the Noatak River.

^c Incomplete survey.

^d Poor weather hampered or prevented survey.

^e Surveys conducted by Division of Sport Fish since 1979.

^f Not surveyed.

^g Poor conditions on the Nimiuktud did not allow a count.

Appendix Table F7. Subsistence whitefish catch and effort in the Kotzebue District, 1970-2000. ^a

Year	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 ^g	84,851
1998	435 ^g	39,754
1999	191 ^g	56,326
2000	237 ^g	70,097

^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.

^g Number of households contacted. Subsistence harvest information from Ambler, Kiana, Kobuk, Noatak, Noorvik, and Shungnak.

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

Appendix G2. Alaska Department of Fish and Game and cooperative studies conducted within the Norton Sound, Port Clarence, and Kotzebue Districts, 2000.

HERRING

Herring Test Fishing

- a)Location: Norton Sound ocean waters; camps located at Cape Denbigh and Klikitarik; a third test fish crew operated out of Unalakleet.
- b)Description: To determine age class composition of the Norton Sound herring return through test fishing with variable mesh gillnets and collection of commercial catch samples.

SALMON

Unalakleet Salmon Escapement Studies

- a)Location: Unalakleet River
- b)Description: To maintain an index of salmon migration up the Unalakleet River using test gillnets. Sample commercial catch for age and size.

North River Counting Tower

- a)Location: North River, approximately 20 minutes by boat from the village of Unalakleet.
- b)Description: Cooperative project funded and operated by Kawerak Incorporated and NSEDC. Determine daily and seasonal timing and magnitude of the salmon escapements.

Kwiniuk River Salmon Counting Tower

- a)Location: Approximately five miles upstream from the mouth of the Kwiniuk River in Norton Sound.
- 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 of the commercial harvest in Moses Point Subdistrict and in the Kwiniuk River escapement.

Niukluk River Salmon Counting Tower

- a)Location: About five miles upstream from the mouth of the Niukluk River in Norton Sound.
- b)Description: Determine daily and seasonal timing, magnitude, age, sex and length of the salmon escapements. Collect age and sex data through escapement sampling of subsistence catches, beach seining or carcass sampling.

Appendix G2. (continued)

Eldorado River Counting Tower

- a)Location: Above the furthest upstream connecting channel to the Flambeau River, approximately 45 minutes by boat from the Safety Sound highway bridge.
- b)Description: Cooperative project funded and operated by Kawerak Incorporated. Determine daily and seasonal timing and magnitude of the salmon escapements.

Nome River Salmon Counting Weir

- a)Location: Nome River, approximately 4 miles east of Nome, Norton Sound.
- b)Description: Determine daily and seasonal timing and magnitude of the spawning salmon 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. Assist in egg takes.

Snake River Counting Tower

- a)Location: Snake river, approximately 5 miles from Nome where turns north.
- b)Description: Cooperative project funded and operated by Kawerak Incorporated. Determine daily and seasonal timing and magnitude of the salmon escapements.

Pilgrim River Counting Tower

- a)Location: Pilgrim River, approximately ½ mile upstream from the end of the Pilgrim Hot Springs road.
- b)Description: Cooperative project funded and operated by Kawerak Incorporated. Determine daily and seasonal timing and magnitude of the salmon escapements.

Northwest Salmon Biological / Rehabilitation Projects

1). Hobson Creek Instream Incubation Project

- a)Location: A spring fed tributary to the Nome River
- b)Description: Instream incubator boxes for supplemental chum salmon production. Construction of incubator facility.

Appendix G2.(continued)

2). Boulder Creek Instream Incubation Project

a)Location: A spring fed tributary to the Snake River

b)Description: Instream incubator boxes for supplemental chum salmon production.

3). Salmon Lake Instream Incubation Project

a)Location: A spring fed tributary to the Salmon Lake

b)Description: Experimental instream incubator boxes for supplemental sockeye salmon production.

4). Salmon Lake Limnology Project

a)Location: A 1,851 acre lake at the headwaters of the Pilgrim River which drains into Port Clarence.

b)Description: To apply liquid fertilizer to restore the sockeye population to historical levels and to obtain limnological and biological data to evaluate the effectiveness of fertilizer application.

5). Glacial Lake Limnology Project

a)Location: A 986 acre lake at the headwaters of the Sinuk River which drains into the Bering Sea.

b)Description: To obtain limnological and biological data to evaluate the potential to restore the sockeye population to historical levels.

Kobuk River Test Fish Project

a)Location: Lower Kobuk River near Kiana

b)Description: 1) To evaluate the chum salmon abundance migrating into the Kobuk River drainage using systematic drift gillnet catches.

2) To assess, in a qualitative way, the impact of the Kotzebue District commercial salmon fishery on chum salmon abundance into the Kobuk River drainage for fisheries management purposes.

3) Describe the migratory timing for chum salmon in the lower Kobuk River.

4) Sample for age, sex and length.

Appendix G2. (continued)

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.

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 100 mm.

Appendix G3. Norton Sound, Port Clarence, Kotzebue Sound processors, 2000.

<u>Company</u>	<u>Address</u>	<u>Type of Processing</u>	<u>District</u>
Aqua Tech	P.O. Box 10119 Anchorage, AK 99510	Fresh Crab	Norton Sound
Glacier Fish Co.	1200 West Lake Ave Suite 900 Seattle, WA 98109	Frozen Salmon	Norton Sound
Icicle Seafoods	4019 21 st Ave West Seattle, WA 98199	Frozen Herring	Norton Sound
New West Fisheries	601 West Chestnut Bellingham, WA 98225	Frozen Herring	Norton Sound
Norton Sound Seafood	Box 323 Unalakleet, AK	Frozen/Fresh Salmon Herring Roe on Kelp	Norton Sound
North Alaska Fisheries	Kotzebue, AK	Fresh Salmon	Kotzebue
SnowPac	5053 E Marginal Way S Seattle, WA 98134	Frozen Herring	Norton Sound
Trident Seafoods	5303 Shilshole Ave NW Seattle, WA.	Frozen Herring	Norton Sound

NORTON SOUND AND SEWARD PENINSULA AREA

2000 SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY

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

Community: _____

Household Head Name: _____

Survey Date: _____

*Household Size _____

Interviewer: _____

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 _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

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 _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("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 _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

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)

NORTON SOUND AND SEWARD PENINSULA AREA
2000 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 _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

(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 _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

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?

NOATAK RIVER AREA

2000 SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY

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

Community: _____

Household Head Name: _____

Survey Date: _____

*Household Size _____

Interviewer: _____

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 _____	CHINOOK _____	PINK _____	SOCKEYE _____	COHO _____	UNKNOWN SALMON _____
("DOGS")	("KINGS")	("HUMPIES")	("REDS")	("SILVERS")	

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 _____	CHINOOK _____	PINK _____	SOCKEYE _____	COHO _____
("DOGS")	("KINGS")	("HUMPIES")	("REDS")	("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? _____
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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 _____	CHINOOK _____	PINK _____	SOCKEYE _____	COHO _____	UNKNOWN SALMON _____
("DOGS")	("KINGS")	("HUMPIES")	("REDS")	("SILVERS")	

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

10. How many dogs does your household have? _____

(Go to #13)

NOATAK RIVER AREA

2000 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 _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

(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 _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

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?

KOBUK RIVER AREA

2000 SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY

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

Community: _____

Household Head Name: _____

Survey Date: _____

*Household Size _____

Interviewer: _____

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 _____
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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")
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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 _____
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Were these salmon included in the estimates you already gave me? No _____ Yes _____

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

KOBUK RIVER AREA

2000 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 _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

(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 _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

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?