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2001
NORTON SOUND - PORT CLARENCE - KOTZEBUE

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PRESENTATION

This report summarizes the 2001 season and historical information concerning management of the commercial and subsistence fisheries of the Norton Sound, Port Clarence and Kotzebue Sound Districts. Data from special management and research projects are included in this report. A more complete documentation of project results is presented in separate reports.

Data presented in this report supersedes information found in previous management reports. An attempt 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)

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 of 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 2001, 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 five 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 15 surveyed communities, surveyors attempted to contact 100 percent of the households, with an actual contact rate of 77 percent in 2001. 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 2001 consisted of an Area Management Biologist, three Assistant Area Biologists, and the Admin Clerk III stationed in the Nome office. In addition, seasonal assistance in conducting various management and research activities was provided by approximately 20 seasonal biologists and technicians in Norton Sound and Kotzebue Sound. Biologists from the regional staff provided additional assistance. In 2001, interns funded by Norton Sound Economic Development Corporation (NSEDC) were utilized as fisheries technicians in some projects. Three cooperative projects staffed by Kawerak Inc. and one project operated by U.S. Bureau of Land Management (BLM) in Norton Sound supplemented the salmon escapement monitoring activities of the area staff.

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

Management of the salmon fishery is complicated by the difficulty 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 also 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.

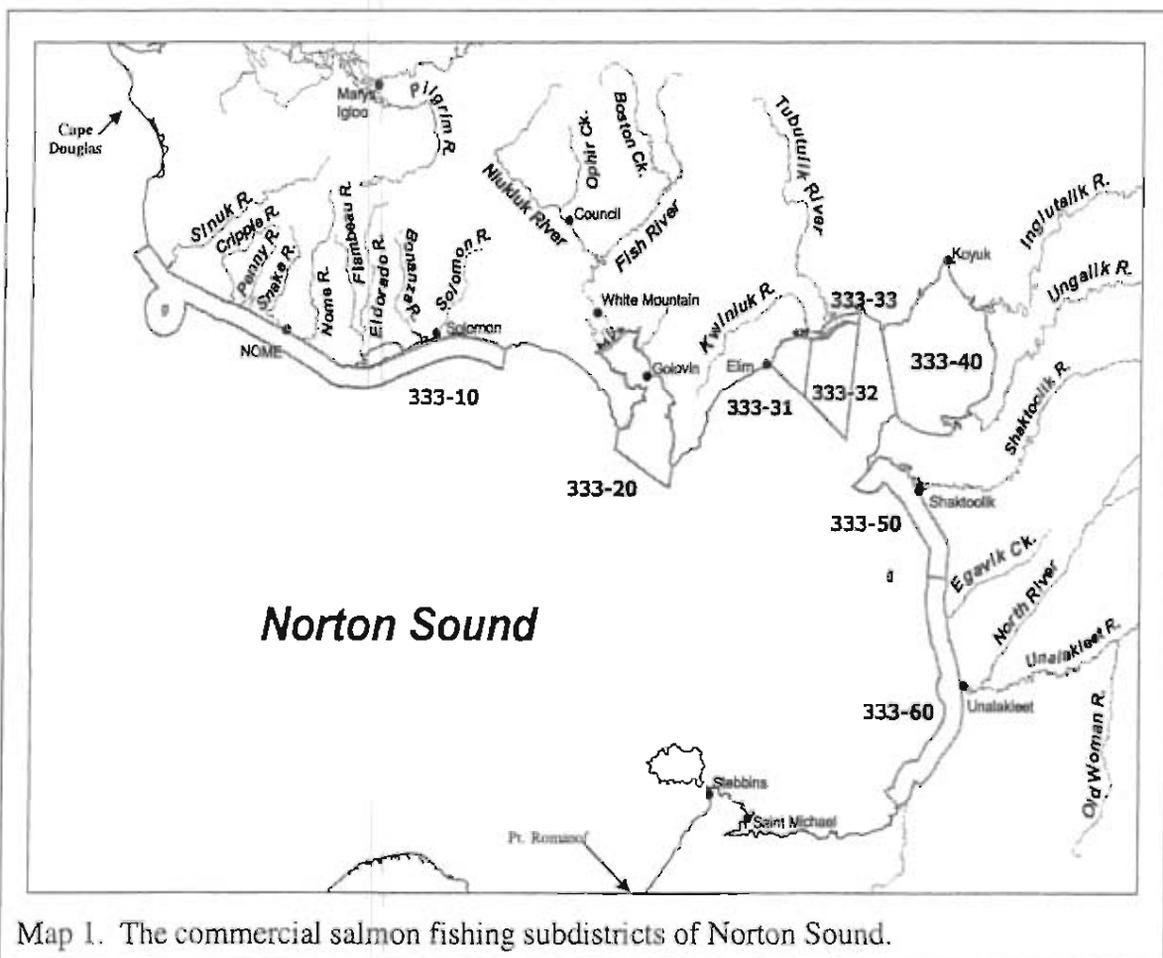
The basic regulation that governs the commercial salmon harvest in all districts is the scheduled weekly fishing period. Commercial fishing regulations provide for a total of two to four days of fishing per week during the open season depending on area and season. The Department attempts to distribute 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 1800s and continued after the American purchase (Magdanz 1981). The activities and support for hundreds of commercial whalers and trading ships caused trading to increase in the region around 1848 (Ray 1975). The increased competition for walrus, caribou, and other species from outsiders may have increased the importance of salmon to area residents (Magdanz 1981). In the late 1890s gold was discovered on the Seward Peninsula and boom-towns sprang up with thousands of new immigrants flocking to the region. 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 and barter 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 1960s, commercial salmon fishing developed into a source of summer cash and snowmachines were replacing the need for dog teams (Thomas 1982). The use of dry fish to feed dogs decreased and cash became more available for exchange at stores.

Commercial Fishery Overview

Commercial salmon fishing in this district first began in the Unalakleet and Shaktoolik Subdistricts in 1961. Most of the early interest involved chinook and coho salmon 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. Up to two 48-hour fishing periods can occur each week unless changed by emergency order with the exception of the Moses Point Subdistricts, where two 24-hour fishing periods can be scheduled each week. Because of lower fish runs and a large concentration of users in the Nome Subdistrict there has been no commercial salmon periods since 1997.

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 and weirs are a much more consistent and accurate method of obtaining escapement information and have been utilized on several river systems in Norton Sound. Five counting towers and two weirs were operated in 2001.

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 1980s. 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 chum salmon 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 subsistence fishery. Conversely, the Norton Bay Subdistrict has healthy stocks, but has 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 eight Norton Sound villages. Subsistence harvest estimates for the district are generated from the data gathered by the survey project.

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

Unalakleet River. Since the early 1990s a portion of the subsistence nets have been fished in the ocean in order to avoid large debris loads from spring runoff.

Low salmon stock levels in the Nome Subdistrict combined with a large concentration of users has required 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 intercepted non-local stocks. A 1978-79 Norton Sound stock separation study confirmed this view. Salmon tagged near Nome were re-captured in fisheries from Golovin (Subdistrict 2) to Kotzebue. In an attempt to provide for spawning requirements 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 who obtain a registration permit and individual harvests would be restricted 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.

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

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

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

Subdistrict 1

Snake River: 1,600 – 2,500 chum salmon

Nome River: 2,900 – 4,300 chum salmon

Eldorado River: 6,000 – 9,200 chum salmon

Subdistrict 3

Kwiniuk River: 11,500 – 23,000 chum salmon

Tubutulik River: 9,200 – 18,400 chum salmon

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

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

2001 Norton Sound Salmon Fishery

Commercial Fishery Summary

The 2001 Norton Sound commercial salmon season can be described as one of the poorest seasons on record (Appendix Tables A1-A14). The fishing season began two weeks later than usual on July 5 due to a late spring, and weak chinook salmon returns, and ended 10 days before the regulatory closure on September 7 as a result of below average coho salmon returns. Commercial fishing time and areas were set throughout the season by Emergency Order (Appendix G7). The combined commercial harvest of all salmon species was the second lowest on record and the number of commercial permits fished was the lowest on record. As a result, the 2001 fishery value to the fishers of \$56,921 was the lowest value since 1967.

Appendix Table A8 lists the Norton Sound salmon historical and current year commercial harvests relative to the recent 5-year (1996-2000) and the recent 10-year (1991-2000) averages. The total salmon harvest was very poor for all salmon species. The 2001 chinook salmon harvest of 213 was the lowest on record and was 96% below the recent 5-year and 10-year average catches. The coho salmon harvest of 19,492 was 48% below the recent 5-year average, and 64% below the recent 10-year average. The 2001 pink salmon return was weak as expected allowing no commercial harvest. The chum salmon commercial harvest of 11,100 was 26% below the 5-year average and 69% below the 10-year average. The low harvests of all species totaling only 30,849 salmon can be attributed almost exclusively to the low salmon runs throughout Norton Sound. A commercial market was available, but harvestable surpluses of salmon were very low which dictated restrictive fisheries management.

Only one primary salmon buyer operated in Norton Sound during the 2001 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 and from Golovin and Moses Point Subdistricts. Some salmon from Golovin Subdistrict were brought to Nome and sold. At Unalakleet, salmon were headed and gutted, iced, and then most were transported fresh to markets in Anchorage via airfreight. Some salmon filets were frozen and sent to the local

school district. Table 1 lists the Norton Sound 2001 salmon catch by subdistrict. Over half the Norton Sound catch was in the Unalakleet Subdistrict, which has been usual in past odd-numbered years in the last decade. The higher percentage of the catch in the Unalakleet Subdistrict is the result of the proximity of the fishery to the fish plant and the low pink salmon catches in odd-numbered years. Likewise over half the 51 permit holders participating in the Norton Sound District commercial fishery fished in the Unalakleet Subdistrict.

The average price paid for chinook salmon was \$1.00 per pound, \$.25/lb for coho, and \$.19/lb for chum salmon (Appendix Table A10). The total value of the raw fish reported on fish tickets in 2001 was \$56,921 (Appendix Table A11). This was 76% below the recent 5-year average and 84% below the recent 10-year average. The unusually low fishery value of 2001 was attributed to the exceptionally low harvests of chinook and coho salmon.

Subsistence Fishery Summary

In 2001, a subsistence priority went to 30 individuals who applied and qualified for the limited Tier II permits based on fishing history, dependence, and the projected harvestable surplus. The intent was to allow these 30 permit holder's first priority over other subsistence users should only a small harvestable surplus of chum salmon develop. If the run was assessed to be strong, then the subsistence fishery would open to all residents of Alaska who obtain a subsistence salmon fishing permit and restrict individual harvests to prescribed bag limits as stated above.

The department documented the 2001 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, 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 2001 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 2001 for the third 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 2001, 110 Tier I and 30 Tier II permits were issued to Nome area residents (Table 2, Table 3). One Tier II fisher did not pick up their permit. Ninety-six of the Tier I permits were returned to the department. Twenty households requested permits for the Kuzitrin or Pilgrim River drainages (Port Clarence District). Ten permits were issued for the Fish and Niukluk Rivers (Golovin Bay Subdistrict). Permits are not required for this area, but some fishers want to document their subsistence catch.

The subsistence harvest in the Norton Sound District in 2001 was 71,346 fish (Table 9). This was the second lowest subsistence harvest documented in the eight years of this

survey project. Of the total salmon harvest, 8% were chinook, 28% were chum, 43% were pink salmon, 1% were sockeye, and 20% 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 83 salmon per household in the Norton Sound District. This includes 6 chinook, 23 chum, 35 pink, 1 sockeye, and 17 coho. Subdistrict 5 (Shaktoolik) accounted for the largest mean household harvest of salmon, an estimated 248 fish. The mean household harvests in the other subdistricts were 15 salmon in Subdistrict 1 (Nome), 64 salmon in Subdistrict 2 (Golovin and White Mountain), 52 salmon in Subdistrict 3 (Elim), 127 salmon in Subdistrict 4 (Koyuk), 115 salmon in Subdistrict 6 (Unalakleet), and 50 salmon in southern Norton Sound (St. Michael and Stebbins).

In the Norton Sound District, 61.2% of the households subsistence fished for salmon and an additional 7.5% assisted other households in processing subsistence-caught salmon. Three and one-half percent of the subsistence salmon harvest was used for dog food. Rod and reel was used by about 76.9% of households to harvest salmon, while 85.8% of households used gillnets, 23.5% used beach seines, and 1.8% used drift nets. Coho and pink salmon was the primary target of rod and reel fishing.

In the Norton Sound District (excluding Nome), 53% of the fishing households responded that their subsistence chum salmon fishing was "poor", 40% responded "average", and 6% responded "very good" (Georgette, *in press*).

Season Summary by Subdistrict

Nome - Subdistrict 1. The commercial salmon season in the Nome Subdistrict is scheduled to take place by regulation between July 1 and August 31. However, at the January 2001 Board of Fisheries meeting, commercial fishing for chum salmon was closed and will be reopened only after the harvestable surplus of chum salmon has met Tier I subsistence needs for four consecutive years. There was no commercial salmon harvest due to inadequate surpluses of pink, and coho salmon (Table 1). Commercial fishing in the subdistrict is typically very limited because the local salmon stocks are not abundant and the subsistence demand is high. During the 2001 season, another 10 Tier II permits were issued in mid-July in addition to the initial 20 Tier II permits issued in June. One hundred and ten Tier I subsistence fishing permits were issued in 2001. Some individuals were issued both permit types 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 and Tier II fishers. Tier II fishing was only allowed in marine waters east of Cape Nome for three days per week beginning on June 26. The Board of Fisheries intended to allow more fishing time to Tier II permit holders early in the season when weather conditions are typically more suitable for processing salmon using traditional methods. The Board's intent was to limit the number of fishers, thereby reducing the risk of overharvest early in the run before abundance could be fully assessed. The chum salmon run to the rivers west of Cape Nome was poor, except for the Sinuk River. Fishing was restricted to Tier II fishers east of Cape Nome in marine waters until

mid-July. The chum salmon run to the Eldorado was projected to reach the low end of the escapement goal on July 13 and Tier II fishing was allowed in the Eldorado-Flambeau freshwater harvest areas beginning on July 14. Tier II fishing effort was low, therefore on July 19, another 10 Tier II permits were issued. Escapement to the Eldorado River was projected to reach the midpoint of the escapement range by the third week of July and the first Tier I fishing period was allowed in the Eldorado-Flambeau freshwater harvest areas beginning on July 19. The Flambeau River harvest area was opened to Tier I based on the proximity to Eldorado River and the adequate escapement to date past the Eldorado River tower. The Bonanza River was opened to Tier II fishing also. Aerial survey counts on July 20 confirmed that the escapement goal was made on the Flambeau River, but the Bonanza River was short of its escapement goal and it was closed to further openings. Aerial surveys on July 20 and July 21 of the Sinuk River confirmed that the escapement goal would be met and the river was opened to Tier II fishing on July 22 and opened to Tier I fishing the following week.

The subdistrict reopened to all Tier I and Tier II fishers on August 2 to target coho salmon. The coho salmon return was also initially believed to be late, but later assessed well below average. On August 20, the Nome Subdistrict was again placed on a restricted subsistence fishing schedule through September 15. During the last two weeks of August subsistence fishing was allowed for two 48-hour periods in marine waters and two 24-hour periods in freshwater harvest areas. From September 1 until September 15, subsistence fishing was allowed seven days a week in the marine water and two 24-hour periods a week in freshwater harvest areas. The subdistrict reopened to the regular subsistence fishing only when it was felt that continued restrictions would do little to place more coho salmon on the spawning grounds late in the season while lifting the restrictions would allow harvest opportunity of other species such as Dolly Varden and whitefish.

Golovin - Subdistrict 2. The 2001 Salmon Management Plan stated that the Golovin Bay 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 could be assessed and fishing time adjusted accordingly.

There were four commercial chum salmon periods and two commercial coho salmon periods during the 2001 season. Fishing effort was low in the subdistrict and was attributed to the low price paid for chum salmon and the weak run of coho salmon. A total of 5 permits fished in the district with a catch of 7,094 chum, 43 sockeye, and 30 coho salmon (Table 1 and 5). The recent 5-year average was 1,778 chum, 1 sockeye, and 478 coho.

Moses Point - Subdistrict 3. The Moses Point Subdistrict chum salmon return has been experiencing below average runs despite conservative management actions taken over the last ten years. At the Board of Fisheries meeting in January 2001, the escapement goals for the Kwiniuk and Tubutulik Rivers were revised to account for recent BEG analysis. The

Board established an OEG for each river based on the new BEGs established by the department that was lower than previous years BEG. Two commercial chum salmon periods were allowed in the Moses Point Subdistrict in 2001. The escapement past the Kwiniuk tower was 16,598 chum salmon, which was 24% below the recent 10-year average. The previous escapement goal range was 15,600 to 31,200 chum salmon and the new optimal escapement goal range is 11,500 to 23,000 chum salmon.

The commercial harvest in the Moses Point Subdistrict was 7 chinook, 681 chum, and 1,696 coho salmon for 5 permits fished in 2001 (Table 1 and 6). For comparison, the recent 5-year average harvests were 192 chinook, 9 sockeye, 1,105 chum, and 1,994 coho 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 return strength and timing. In 2001, no commercial salmon fishing occurred due to marginal salmon runs and a lack of buyer interest.

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. As stated earlier, the department's test net in the Unalakleet River and subsistence interviews at Unalakleet are used to set early fishing periods in both subdistricts. As the season progresses, test net catches, commercial catch indices, and the North River counting tower which is operated in cooperation with Kawarak Corporation, are used to assess run strengths 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 stock and not on milling fish. In 2001, the run timing was late with the first fishing periods for chinook salmon in both subdistricts starting on July 5 for 24 hours to test the salmon abundance (Table 7 and 8). The commercial catches were average for chinook salmon and below average for chum salmon. An additional commercial period for 24 hours starting on July 9 resulted in lower catches for both chinook and chum salmon. Indications were that the chum run was weak, as catches should have improved in the second period as the run was approaching the historical midpoint. It was apparent from the commercial fishery and escapement indicators that the chinook and chum salmon runs were too weak to support further commercial harvest. Therefore, no additional chinook or chum salmon directed commercial periods were scheduled.

The first coho caught in the test net was on July 20. There were conflicting reports about the coho run into the Unalakleet River drainage. There were very successful sport catches in the Unalakleet River while tower counts in the North River and test net catches in the Unalakleet River were below average. On July 27, both subdistricts opened to a reduced length coho salmon test period of 24 hours. A series of fishing periods were announced, each one separately, with reduced fishing time of 24 hours. Commercial fishing effort and catches continued to be low. The reduced effort resulted in the CPUE being near average until the August 6 opening which was extended to 48 hours because of poor weather. The openings on August 6 and 9 resulted in above average CPUE's which would be expected with the reduced hours and lower numbers of permits fished in late July and early August (Table 8). As the CPUE indicated improving catches, beginning on August 13 there were two 48-hour periods per week. However, the catches began to drop and continued to drop the week of August 20, and the CPUE began to fall below average even with the low fishing effort. There was a final 24-hour test period on August 27 with a below average catch and CPUE, and the commercial season was closed.

The 2001 commercial catches in the Shaktoolik Subdistrict included 90 chinook, 2,664 coho, and 1,813 chum salmon harvested by 13 permit holders (Table 1 and 7). The chinook salmon harvest was 92% below the recent 5-year average. The coho salmon harvest was 58% below the recent 5-year average and the chum salmon harvest 57% below the recent 5-year average.

The Unalakleet Subdistrict total commercial catch harvested by 29 permit holders included 116 chinook, 15,102 coho, and 1,512 chum salmon (Table 1 and 8). The chinook salmon catch was 97% below the recent 5-year average. The coho salmon harvest was 47% below the recent 5-year average and the chum salmon harvest was 81% below the recent 5-year average.

Escapement

Table 4 summarizes escapement assessments for the major index river systems of the Norton Sound and Port Clarence Districts in 2001. These assessments are often qualitative and relative to historical escapement sizes. Most of the chum salmon assessments are described relative to a Sustainable Escapement Goal (SEG) for an index area. An SEG is a level of escapement that is known to provide for sustained yields over a 5-to-10 year period, and is used in situations where a BEG cannot be estimated due to the absence of a stock specific catch estimate. A BEG is based on spawner-recruit relationships estimated to provide maximum sustained yield. The more formalized BEG has been established for the Nome Subdistrict chum salmon stock. BEGs have been established for seven of the nine individual streams in the Nome Subdistrict based on the historical average proportion of each stream's contribution to the composite Nome Subdistrict chum salmon escapement. BEG's have also been established for the chum salmon stock that returns to the Kwiniuk and Tubutulik Rivers. In addition, at the January 2001 meeting the Board of Fisheries established an OEG for the Eldorado, Nome, Snake, Kwiniuk, and Tubutulik Rivers in the Norton Sound District. An OEG is a specific management objective for escapement that

considers biological and allocative factors and may differ from the SEG or BEG. The Board of Fisheries places an OEG into regulation, and the department will seek to maintain escapements evenly within the bounds of the OEG.

Department escapement projects in the Norton Sound District 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 functional weir in 1996. The Niukluk tower became operational in 1995. Both the Nome and Niukluk River projects have limited years of data that can be used when making comparisons, but have proven to be reliable and will become more valuable the longer they operate.

Three additional counting tower projects were also operated in the management area this season. The Snake, Eldorado, and North River projects were setup and operated by Kawarak Corporation. These projects are cooperative ventures with the Department of Fish and Game who provided technical advice. 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 operate.

Aerial survey assessment conditions were fair to good in the northern subdistricts for most of the 2001 season, but poor to unacceptable in the eastern subdistricts. As usual, the Nome Subdistrict streams received the most intensive assessment efforts because salmon stocks local to the Nome area are strictly regulated, easily accessed by road system, and is exposed to intensive subsistence and sport fishing pressure.

Chinook Salmon. The 2001 chinook salmon return was below average throughout the Norton Sound District. The Unalakleet and Shaktoolik Subdistricts are the primary chinook salmon producers in Norton Sound. Eastern Norton Sound streams generally produce larger runs and therefore, support larger harvests. Aerial surveys of chinook salmon were incomplete due to poor conditions. The Unalakleet test net catches, the Kwiniuk and Niukluk towers, commercial catch rates, and subsistence reports were the primary assessment tools for judging chinook salmon run strength. Almost all indicators suggested chinook salmon escapements were below average throughout Norton Sound.

Chum Salmon. Chum salmon escapements were below average throughout most of the management area in 2001. Survey conditions were good in the Nome Subdistrict where chum salmon escapement goals were achieved in four of the seven rivers with established goals. The Niukluk counting tower is used as an index for the Golovin Subdistrict. The tower has been operational since 1996 and estimated chum salmon passage during 2001 was one-quarter below the recent 5-year average and less than half the escapement in 1996 and 1997. Likewise, the Kwiniuk tower in the Moses Point Subdistrict had a chum salmon escapement one quarter below the recent 10-year average. The Unalakleet Subdistrict had escapements below average based on test net catches and the North River tower counts.

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 can be somewhat incomplete. Streams in the northern subdistricts of Norton Sound are typically surveyed. The more recent Nome area assessment projects are intended to monitor coho salmon as well as chum salmon and are becoming more important to fisheries management. The 2001 coho salmon return to Norton Sound was below average and continued the pattern of below average escapements in odd-numbered years. Subsistence restrictions were implemented in the Nome Subdistrict and reduced commercial fishing time occurred throughout the Norton Sound District. The Niukluk River tower had the lowest coho salmon escapement in the seven-year history of the project. The Kwiniuk River escapement was nearly triple the Niukluk River escapement, but no comparisons can be made with previous years, as this was the first year that the crew counted through coho season. Unalakleet River test net catches suggested coho salmon escapements were below average, but the North River tower counts were over double the counts of the preceding four years. With the fisheries restrictions in Norton Sound in 2001, it appeared that coho salmon escapements were adequate for most streams in 2001, with the exception of the Niukluk River.

Pink Salmon. During recent years, pink salmon returns 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 2001 low returns were evident in Norton Sound streams. Nome weir and Kwiniuk River escapement projects were well below their escapement goals and there was no directed fishery on pink salmon.

Sockeye Salmon. Sockeye salmon are typically found in small numbers throughout Norton Sound with the exception of Glacial Lake where approximately 1,000 fish return to spawn each year. Port Clarence is the salmon district immediately to the northwest of Norton Sound and has a spawning population near 10,000 fish in recent years at Salmon Lake. There are no commercial fisheries on these stocks because of their low abundance and importance to subsistence users. Several aerial surveys were made of Glacial Lake with a peak estimate of 2,020 sockeye salmon, which was well above the escapement goal of 800 to 1,600 sockeye salmon. A weir was operated by the U.S. Bureau of Land Management (BLM), at the outlet of Glacial Lake and counted 2,487 sockeye salmon into Glacial Lake. Several aerial surveys were also made of Salmon Lake with the peak estimate observed on August 16, with 9,400 sockeye salmon counted which was above the escapement goal of 4,000 - 8,000 sockeye salmon.

2002 Norton Sound Salmon Outlook

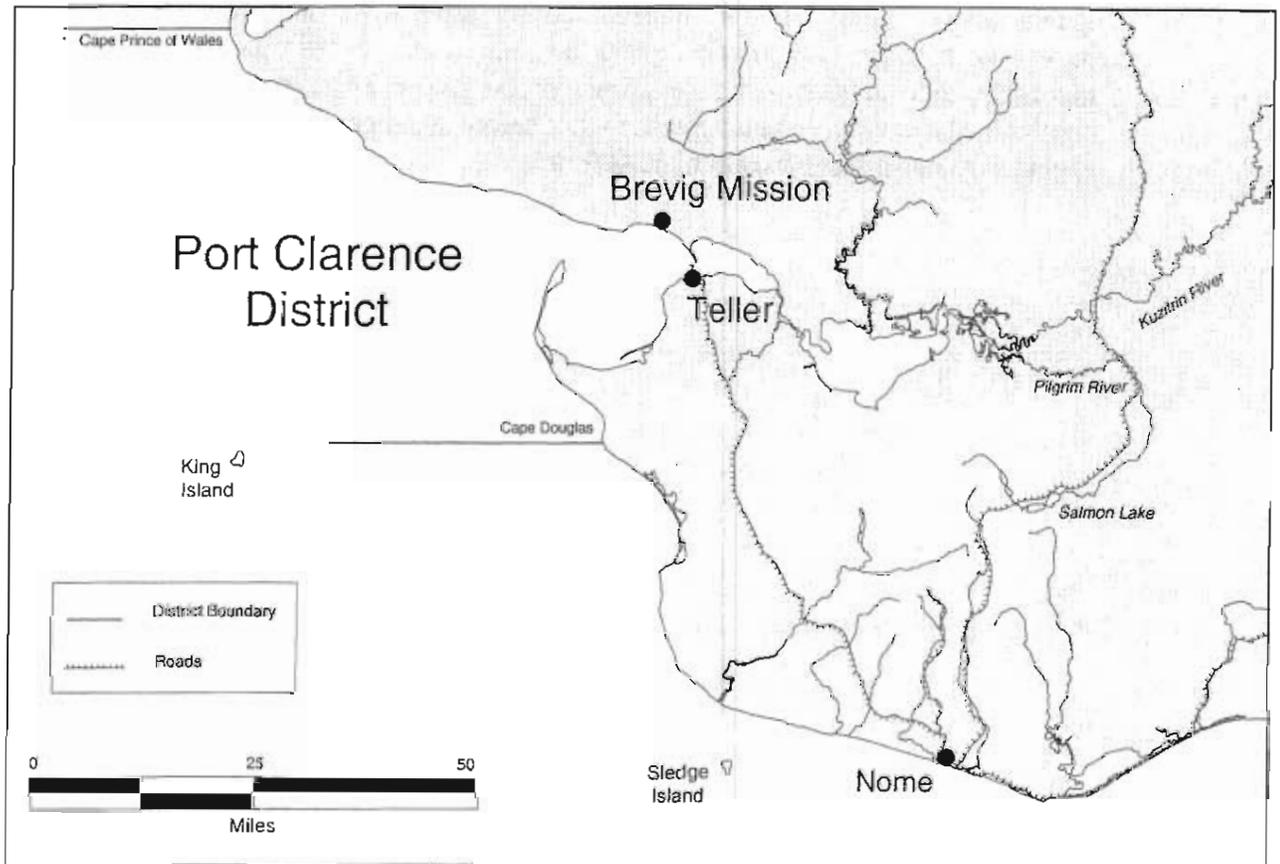
Salmon outlooks and harvest projections for the 2002 commercial salmon season are based on qualitative assessments of brood year returns, subjective determinations of freshwater over-wintering and ocean survival, and projections of local market conditions. Salmon buyers will probably operate in only some of the Norton Sound subdistricts during 2002. The chinook run is expected to have little harvest based on the poor runs of

recent years. There may be limited or no chinook salmon directed periods in 2002. The expected commercial harvest from incidental catches and possible limited chinook fishing periods is from 0 to 1,000 fish. A pink salmon fishery will be dependent on buyer interest. As with the decline seen in other salmon runs in recent years, the 2000 pink salmon return was below average and it is unlikely that there will be strong returns of pink salmon in 2002. If there is sufficient buyer interest, pink salmon harvests may be 150,000 to 250,000 fish. As of April 2002, only one buyer had indicated an interest in purchasing pink salmon, and intended to purchase only 10,000 pink salmon. The 2002 chum salmon run is expected to be below average. Additionally, the market for Norton Sound chum will likely be minimal because of low demand and will also be dependent on buyer interest. Because of the expected below average chum salmon run, the commercial chum salmon fishery will be managed conservatively, but may provide a commercial harvest of between 10,000 and 25,000 fish. Based on the 1998 parent-year escapement, the 2002 coho salmon run is expected to be below average. Accordingly, the 2002 commercial harvest is anticipated to be below average. The commercial harvest is expected to range from 20,000 to 40,000 fish.

PORT CLARENCE DISTRICT

District Boundaries

The Port Clarence District encompasses all waters from Cape Douglas north to Cape Prince of Wales including the Salmon Lake and Pilgrim River drainage (Map 2, Figure 3). Salmon, saffron cod, whitefish and herring are the major subsistence species; however, 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 2001, 20 households requested permits for the Pilgrim and Kuzitrin Rivers (Table 2). Some subsistence salmon fishing by Nome residents in the Port Clarence District may not be documented by household surveys or permit data.

The 2001 estimated subsistence salmon harvest in Port Clarence District was 8,167 fish (Georgette *in press*). Of the total harvest, 1% were chinook, 23% were chum salmon, 14% were pink, 46% were sockeye, and 16% 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 51 salmon per household, which included 0.5 chinook, 12 chum, 7 pink, 23 sockeye, and 8 coho. Brevig Mission had a mean household harvest of 69 fish and Teller had a mean household harvest of 46 fish. Households with Pilgrim River permits harvested a mean of 14 salmon per household.

In the Port Clarence District, 57% of households subsistence fished for salmon in 2001. About 11% helped other households process subsistence-caught fish. Two 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 7%, and seine nets used by 10%. Approximately 72% of the fishing households responded that their chum fishing season was "poor" and 21 percent said "average". About 7% said the chum fishing season was "very good". (Georgette *in press*).

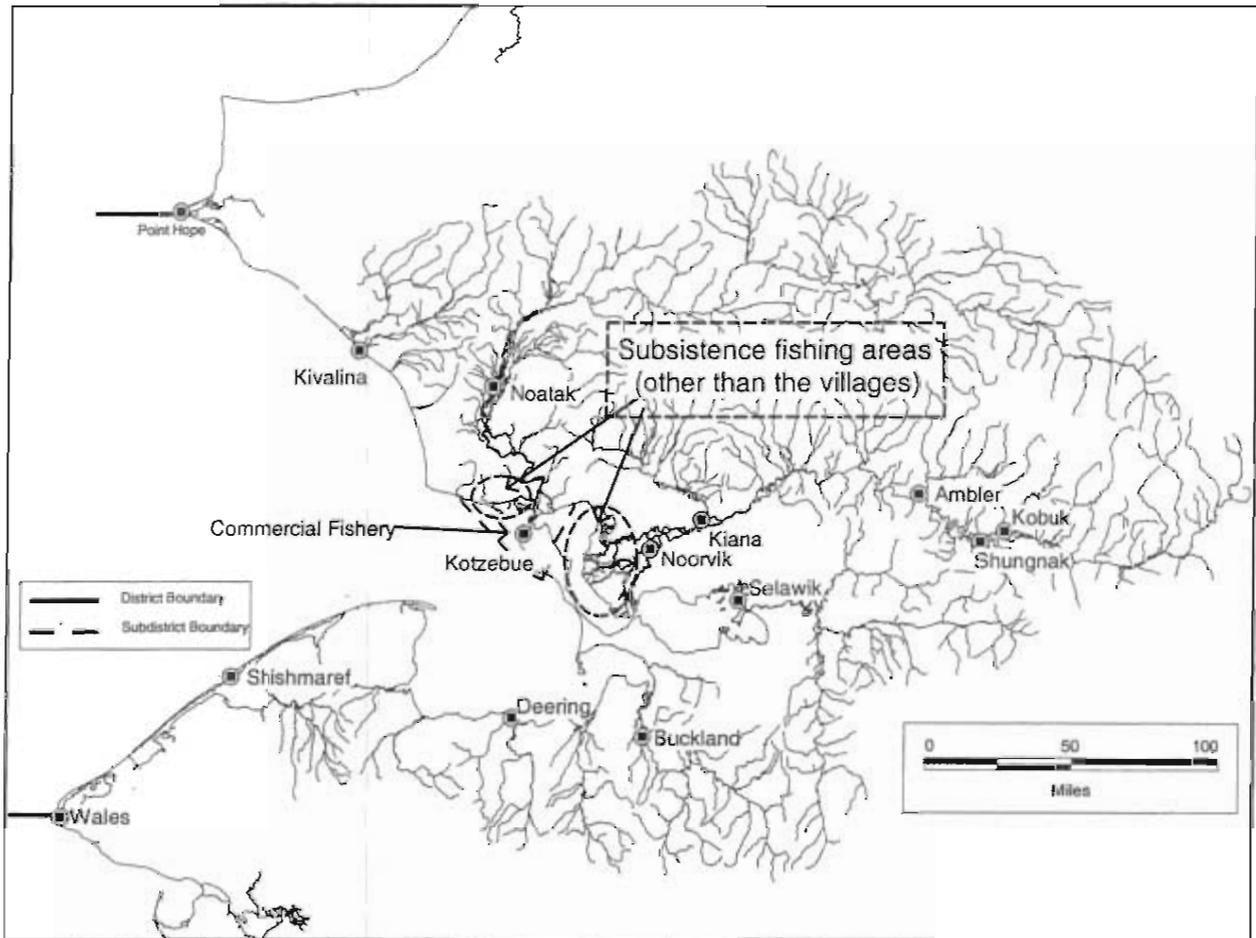
Escapement

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 2001 aerial survey count was 9,400 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 with funding support from NSEDC and BLM since 1997. The goal of the project is to apply liquid fertilizer to restore the sockeye population to historical levels. The department is in the process of analyzing the results to evaluate the effectiveness of fertilization.

KOTZEBUE SOUND DISTRICT

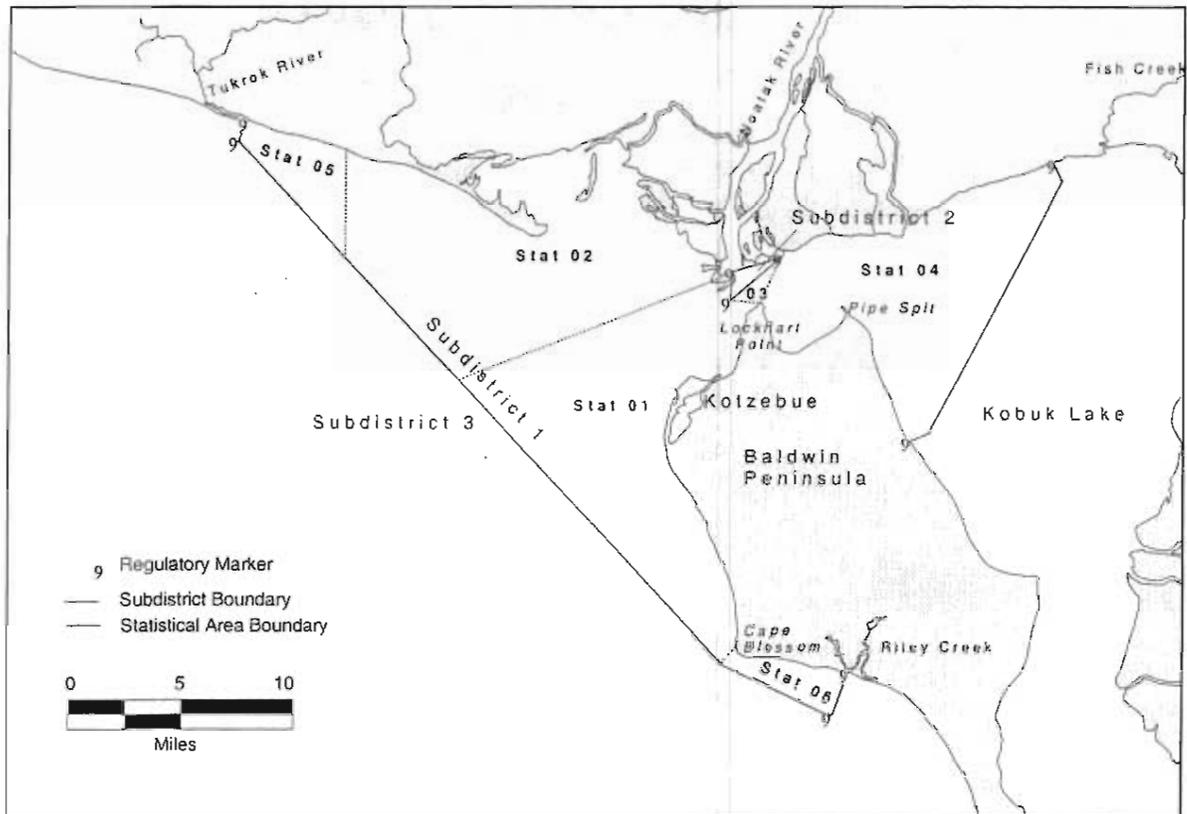
History

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



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

The commercial fishery opened under state management in 1962. Salmon harvests consist primarily of chum salmon although limited amounts of Dolly Varden and a few chinook salmon are harvested as well during the salmon fishery. There were 190 commercial permit holders in 2001, of which 66 actually fished. An average of 97 permits were active over the ten-year period 1991 to 2000. During the recent five year period, 1996-2000, 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% in 1997.

General Information

The 2001 Kotzebue Sound commercial salmon season ended with an average harvest. The fishing season began on July 10 by regulation and closed August 24 when the last buyer ceased operations. The commercial harvest in the Kotzebue District consisted of 211,672 chum salmon and 6 chinook salmon (Table 11). The chum salmon harvest fell within the preseason harvest projection of 200,000 to 300,000 fish. Buyers shipping capacity limited the harvest. Only 66 of a possible 190 permit holders fished during the season with the greatest number participating in any one opening being 40. Participation remained above 60 permit holders for the third year in a row.

Two salmon buyers operated in Kotzebue Sound during the 2001 season. Each buyer ran a buying station at the end of the Kotzebue airport where fish were packed whole in ice and flown to processing plants. Great Pacific Fisheries transported fish to Anchorage for processing while Norton Sound Seafood Products flew fish to a processing plant in Unalakleet.

The buyers requested that the Department continue having 12-hour openings and end openings at 6:00 pm to coincide with airline schedules. The 12-hour opening schedule has been used for the last five years. Buyers requested that four openings be less than 12 hours because the expected harvest from those openings were larger than their shipping capacity. A total of 32 openings occurred between July 10 and August 24. Total fishing time was 366 hours or 69% of the long term average of 530 hours (Table 11).

Buyers purchased a total of 1,847,262 pounds of chum salmon (average weight 8.7 lbs) at an average price of \$0.17 per pound and 64 pounds of chinook salmon (average weight 10.7 lbs) at \$1.00 per pound. Ten chum salmon were retained for personal use. The total exvessel value was \$322,650 to Kotzebue area fishers with an average of \$4,889 for each participating permit holder (Appendix Table C3).

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

2001 Commercial Season Summary

Inseason Management

Primary fishery management objectives were to provide adequate chum salmon escapement through the commercial fishery to ensure a sustained run and to provide for the subsistence priority (Appendix Tables C1-C8). Fishery management depended on comparing period and cumulative inseason catch rates to that of previous years. Age composition data and the Kobuk River test fish indices were also followed closely.

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 2001 catch and effort data with that of previous years, information from the 12-hour openings were combined. Monday through Wednesday was considered as one period and Thursday and Friday to be another, for comparison to the historical two 48 hour openings a week.

A test fishery conducted on the Kobuk River for the ninth year provided the only inseason escapement information. Poor weather and high water levels did not allow aerial surveys during the commercial fishery.

Age composition of the catch was also closely monitored to determine the strength of age classes in the return. Older salmon tend to migrate into freshwater first, a fact that affects catch rate as the season progresses and influences the fishery managers evaluation of the catch statistics. A weak 4-year-old age class tends to depress mid-season catches.

Season Narrative

The season was opened on July 10 by emergency order with 12-hour openings from 6 AM until 6 PM on Tuesday, Wednesday, Thursday, and Friday. During the first period nine fishers participated (Table 11). New fishers continued to enter the fishery for the first three weeks of the season. Participation remained above 30 fishers from period four though period eleven after which the harvest declined dramatically. The season started strong with above average catches and CPUE (Figure 6). The CPUE generally remained above average throughout the season.

The five-year-old age class generally dominates the early commercial openings with the younger age classes moving through during the middle and latter part of the fishery. The five-year-old component continued to make up an above average portion of the harvest until the August 1 opening (Figure 7). The five-year-old age class appears to have been above average with the Kobuk River test fish CPUE starting off as the second highest on record and remaining there all season (Table 13, Figure 8).

On July 17 buyers requested an additional 12-hour opening for July 18 because of the strong early return and poor weather on July 17. The CPUE was above the historical average and the maximum number of fishermen participating up to that date was low therefore the requested change was implemented (Figure 6). Five days per week fishing continued until August 3. The harvest peaked the week of July 23 and catches remained strong though August 8. On four occasions during this time the buyers requested that openings be shorter than 12 hours because of their concern about handling the volume of harvest. After August 8 fishing continued four days a week because the four-year-old age class appeared to be weak to average in abundance.

The age structure of the commercial catch was much different than the historical average, being dominated by a larger portion of five-year old fish through the first half of the

season (Table 12, Figure 7). The age structure accounts for the strong early return and a non-typical five-year-old peak.

Subsistence Season Summary

In the Kotzebue Sound District, household surveys were conducted in the Noatak and Kobuk River villages of Noatak, Noorvik, Kiana, 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 19% 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 *in press*).

The subsistence salmon harvest in the Kotzebue District in 2001 was 49,844 fish (Table 14). Chum salmon made up 98% of the catch with the remaining portion a mix of other salmon species, which are present in only small numbers in the district. (Georgette *in press*).

The estimated mean salmon harvest was about 43 salmon per household. This included 42 chum, and 1 coho. Noorvik had the highest mean household harvest of 158 salmon. The mean household harvests in the other communities were Noatak with 25 salmon, Kobuk with 109 salmon, Shungnak with 94 salmon, and Kiana with 62 salmon.

In the Kotzebue District, 27% of households subsistence fished for salmon in 2001 and about 8% assisted other households in processing subsistence-caught salmon. Four percent of the subsistence harvest was used for dog food (excluding Kotzebue). Set gillnets were used by 38% of households for harvesting salmon, while 65% of households used rod and reel, and 5% used a seine.

In the Kotzebue District, 9% of the fishing households responded that their chum salmon fishing season was “poor,” 42% said “average,” and 49% said “very good” (Georgette *in press*).

Escapement

A test fish project located just downstream from the village of Kiana monitored escapement into the Kobuk River. The test fish index of 1,574 was the second highest in the nine years the project has been in operation (Table 13, Figure 8). The lowest index recorded was 494 in 1993. Aerial surveys indicated that escapement was adequate in 1993. In 2001, the Kobuk River test fish index did not follow the typical pattern. A much larger number of index points were generated early in the season indicating an above average return of five-year-old-fish. No aerial survey escapement monitoring was conducted on the Noatak River in 2001 due to poor weather and a lack of aircraft. However, twice in August test fishing was conducted in the lower Noatak River by

department and National Park Service staff to obtain chum salmon age-sex-length samples.

Only one aerial survey was conducted in the Kotzebue District in 2001 because of high water levels and time constraints. The aerial survey was conducted on the upper Kobuk River above Kobuk village on August 24. The count of 13,420 live chum salmon was made under good survey conditions. Observations indicated the escapement to be within the escapement range.

2002 Outlook

The outlook for the 2002 season is based on the parent-year escapement and returning age classes observed in the 2001 run. During the 2002 season, the four-year-old and five-year-old component of the return is expected to be average. The three-year-old and six-year-old component is generally small, but are likely to be near average. The commercial harvest is expected to fall within the range of 150,000 to 200,000 chum salmon, if market conditions can accept that level of harvest.

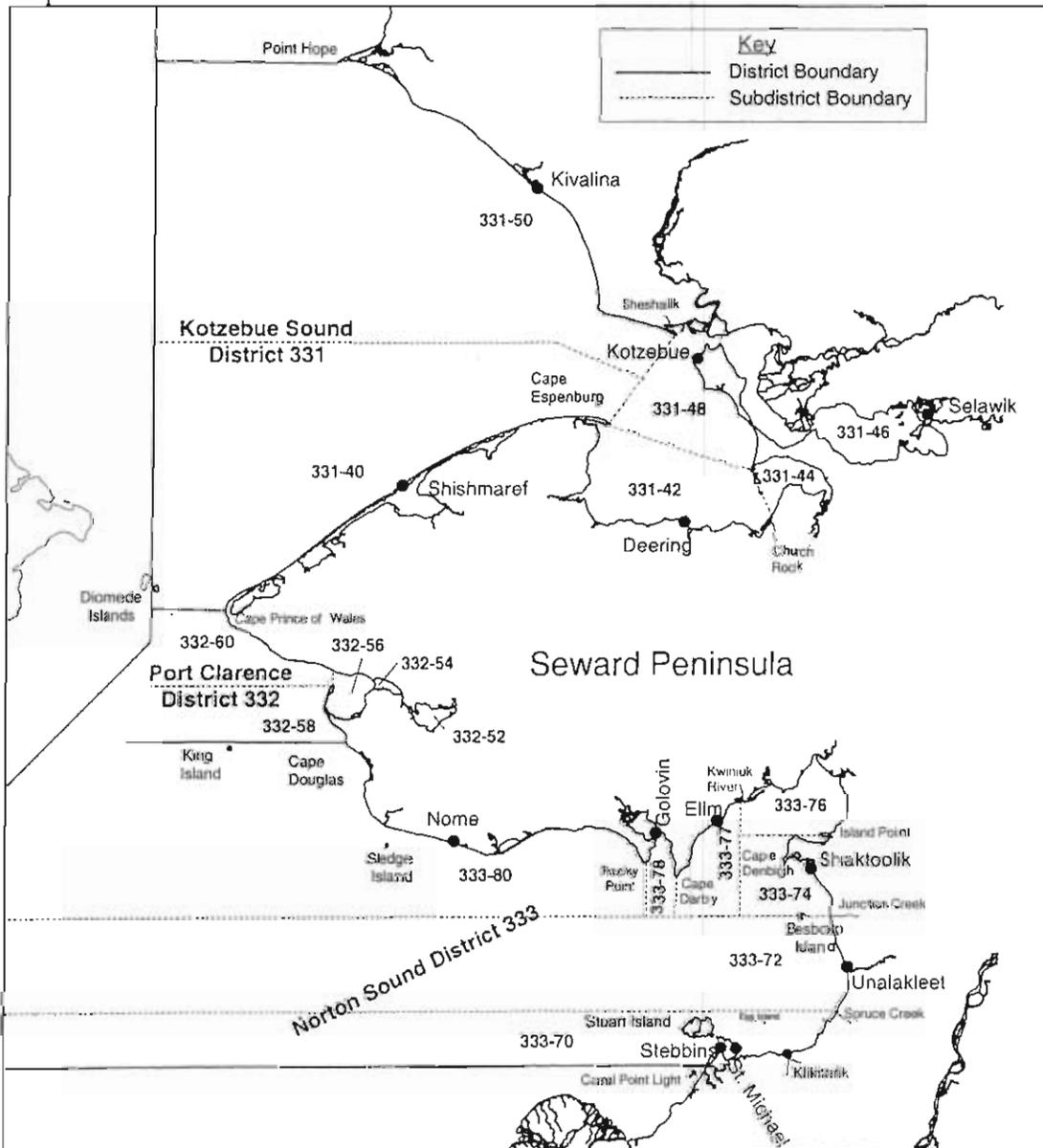
Section 2: PACIFIC HERRING

(Includes Norton Sound and
Port Clarence/Kotzebue Districts)

INTRODUCTION

Boundaries

The Norton Sound District consists of all waters of Alaska between the latitude of the western most tip of Cape Douglas and the latitude of Canal Point Light (Map 5, Figure 9). 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-1800s when their use was first documented by early explorers. The earliest American commercial effort on Bering Sea herring apparently took place in the early part of 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, D4). 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 (Appendix . Some fishers made both beach seine and gillnet deliveries. 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 3,915 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 open pound fishery and allowed for a wild *Fucus* spawn on kelp fishery for sac roe permit holders who had not sold sac roe product. The wild *Fucus* harvest is limited to that area west of Wood Point to Canal Point Light, including Stuart Island. The herring spawn-on-kelp guideline harvest level may not be more than 90 tons. The herring spawn-on-kelp guideline harvest level includes the combined weight of herring eggs and kelp. The department shall manage the herring pound spawn-on-kelp fishery to achieve the spawn-on-kelp guideline harvest level by restricting the number of blades of kelp that may be suspended from a herring pound as follows: (1) no more than a total of 75,000 blades of kelp are allowed in the herring pound spawn-on-kelp fishery; and (2) the maximum number of blades of kelp any permit holder may attach to a herring pound is 3000; if more than 25 permits are issued for the herring pound spawn-on-kelp fishery, the department shall determine the number of blades of kelp a permit holder may attach to a herring pound by dividing 75,000 by the number of permits issued.

Management Strategies

The overall statewide management strategy is to annually harvest 0-20% of the herring biomass. The upper end of the exploitation range is applied to stocks in good condition. The lower end of the exploitation range is applied to stocks 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.

The present market desires a high roe percent as well as larger size fish. This has been difficult to achieve with beach seine gear and in recent years there has been little buyer interest in herring harvested from beach seines.

2001 SEASON SUMMARY

The 2001 herring market was expected to be poor even before the southernmost herring fisheries opened.

Spawn on Kelp

Permit holders wishing to participate in the *Macrocystis* spawn-on-kelp open pound fishery were required to register with the Nome Fish and Game office by April 16. Five permit holders registered as participants in the *Macrocystis* fishery. Three of the five fishers deployed kelp on the evening of June 14. Broken ice floes in Subdistrict 1 had prevented the deployment of kelp prior to this date. The three permit holders harvested approximately 4,400 pounds of product (Table 17). Although the spawn on kelp product has been processed, the final sales of the spawn on kelp have not been completed. No value is available at this time.

Timing is one of the most critical factors in the open pound fishery. The operators must predict at least 5 days ahead of time when spawn may occur to allow time for the kelp to be harvested in southeast Alaska, shipped, and placed in the pounds. The main wave of spawn began on June 13 and 14 in 2001, but fishers were delayed in deploying kelp due to the ice in southern Norton Sound. Overall quality of the product was average to poor.

Sac Roe

The 2001 Norton Sound herring fishery opened by Emergency Order on June 12 with three companies registered to buy. The total harvest of sac roe herring based on fish ticket data was 2,245 tons of herring with an average roe recovery of 12.3% (Table 16). In Subdistrict 1, 898 st of herring was harvested at 12.2% average roe recovery. In Subdistrict 3, 1,347 st were harvested at 12.4% average roe recovery. Buyers reported 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. There were 73 gillnet fishermen who made at least one delivery during the season. No beach seine permit holders were present in Norton Sound in 2001 due to marketing problems. The 2001 season had the highest roe percent in the history of the fishery. The season also ranked as the third lowest harvest and effort in the history of the fishery.

Three companies were present on the grounds during the 2001 season with 3 processors and 13 tenders registered (Appendix G3). Based on final operations reports, it appears the average price advanced for a short ton of 10% roe herring was \$133.00. The total value of the herring harvest to the sac roe fishermen was approximately \$347,523. This averages out to \$4,761 for each fisherman making a landing. The 2001 season ties with 1994 as the second lowest year in terms of value (Appendix Table D3).

Fishery Management/Emergency Orders

The department projections for the 2001 spawning biomass, for the Norton Sound sac roe fishery was 26,305 tons. At 20% exploitation rate, the guideline harvest level for the Norton Sound District was 5,261 tons. A maximum of 320 st of herring was reserved to allow for the harvest of not more than 90 st of spawn on kelp. A total of 4,447 tons allocated to the gillnet fishery and 494 for the beach seines seine fishery. The first tenders arrived at Norton Sound on May 25. Although the majority of Norton Sound was ice free, shore fast and broken ice was still present from Unalakleet to Stuart Island. Some shore fast ice also remained between Shaktoolik and Cape Denbigh. Herring were first observed in Norton Sound on May 28 when an aerial survey documented 22 tons on the west side of Cape Denbigh. Significant breakup of shorefast ice began moving around southern Norton Sound on May 29. The first herring were captured in department test nets on May 31 in the Cape Denbigh Subdistrict. Herring were observed in larger quantities on June 10 with the first herring spawn observed on June 11 (Table 15).

There was a limited market for sac roe herring and the harvest was anticipated to fall far short of the 4,447 gillnet guideline harvest. Fog and low ceilings prevented accurate aerial survey efforts, but the department's test fish samples indicated that the herring return was similar to the 2001 preseason projection. Therefore the department decided to open commercial gillnet fishing in Subdistricts 2 and 3 on June 12 to test the commercial quality of herring available and catch the first wave of fish entering Norton Sound. Fifty fishers harvested 754 tons of herring with an average roe recovery of 12.6% (Table 16). The entire fleet was concentrated in the Cape Denbigh area because pack ice was still causing problems in the southern subdistrict. On the evening of June 12, ice in Subdistrict 1 had begun to move offshore. One company sent a tender through the ice to be in position for test fishing early on June 13. Weather and wave action on June 13 prevented fishing in Subdistrict 3, but conditions in Subdistrict 1 were good. Commercial test fishing samples showed good quality fish and the department opened commercial fishing in Subdistrict 1 at 1:00 pm. Seven fishers harvested 157 tons of herring at 13.0% roe recovery. On the evening of June 13 and early morning June 14, some fishers relocated to the southern subdistrict from the Cape Denbigh area. This spread the fishing effort out more evenly between the two subdistricts. On June 14, 38 fishers in Subdistrict 1 harvested 266 tons of herring at 12.2% and in Subdistrict 3, 25 fishers harvested 178 tons at 12.8%. On June 15 and 16, commercial fishing in Subdistricts 1 and 3 continued to harvest good quality herring with excellent roe percentages (Table 16).

On June 16, two companies ceased buying operations in Norton Sound. One company remained in the district, but could not purchase herring on June 17 because their processing capacity was full. On June 18 a commercial gillnet opening occurred from 2 pm until 6 pm in Subdistricts 1, 2 and 3. No herring was harvested. Fishers reported low volumes of herring with mixed quality. Roe percents from test samples were much lower than previous openings. On June 19, fishers could not locate any marketable herring after two separate openings in Subdistricts 1 and 3. Since June 14, there had been an increased catch of recruit herring in the department test nets. Commercial test fishing indicated a

lack of large herring present in the district. An aerial survey flown on June 19 documented no new spawn and schools of herring were observed in spawned out configurations. To avoid fishing on recruit herring the department closed the commercial gillnet herring fishery effective June 20.

There was a total of nine commercial gillnet periods in the Norton Sound District between June 12 and June 20 for a total of 92 hours of fishing time. Twenty-three emergency orders (EOs) were issued (Appendix Table G7). Fishers were restricted to one 50 fathom gillnet throughout the season. This was due to ice in southern Norton Sound and market concerns regarding low processing capacity. The concern with the presence of ice is the likelihood of losing nets if more than one unit of gear is allowed.

Catch Reporting and Enforcement

Herring buyers registered for the 2001 season communicated exceptionally well with the department during the fishery. Commercial test-fishing results were relayed in a timely manner, which provided managers with adequate time to formulate plans and make announcements. Buyers also had a much greater role in deciding where and when to fish because of the limited market. Buyers were required to report herring purchases daily (8:30 a.m.) 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. Managers made fishery updates and emergency announcements over both VHF and SSB radios simultaneously to 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.

Two Fish and Wildlife Protection officers were on the Norton Sound herring grounds patrolling throughout most of the 2001 fishery. Protection efforts consisted of two single engine aircraft and a small boat on loan from the department. Three citations were issued all relating to commercial fishing without an ADF&G Number Plate on the vessels. Approximately 30 warnings were given for no photo identification.

Abundance and Research

Three Department field crews operated during the 2001 season. One crew operated from Cape Denbigh. The second crew, which usually operates from a camp at Klikitarik, was based in Unalakleet. Ice prevented them from getting to their camp until the commercial fishery was well underway. A third test fishing crew was also 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 for collecting biological information about the stocks.

Unalakleet field office personnel during the season consisted of the area management biologist, two assistant area biologists, and two seasonal fishery technicians. Norton Sound

Economic Development Corporation supplied one fishery intern to assist ADF&G in test fishing and sampling during the herring fishery.

Biomass Determination

The peak survey took place on June 21 when approximately 11,551 tons of herring were observed, most in spawned-out configurations. This was well below the 26,305 tons of herring that was projected. Fog and low clouds continually caused problems with flying surveys during the fishery. The primary spawning was thought to have taken place between June 13 and 15. Only partial aerial surveys were flown on these days due to poor weather. A total of twenty and one half miles of spawn was observed throughout the fishery. The department is confident that the projected biomass was present in Norton Sound, and that weather prevented the observation of the peak biomass between June 13 and 15.

2002 Outlook

By adjusting for growth and survival, it is estimated that the 2002 biomass will be 22,463 tons, allowing a harvest of 4,493 tons at a 20% exploitation rate. A maximum of 320 tons of herring are to be reserved to allow for the harvest of not more than 90 tons of spawn-on-kelp. This leaves 4,173 tons for the sac roe harvest (3,756 tons by gillnets, 417 tons by beach seines) and any subsequent bait fisheries. The beach seine harvest will not exceed 417 tons that equates to 10% of the allowable sac roe harvest. Ages 5, 6, and 9 are expected to dominate the returning biomass (19.5%, 24.2% and 21.4% respectively). Age 9 and older herring are expected to contribute over 49.7% of the return (Figures 10-12).

PORT CLARENCE / KOTZEBUE DISTRICTS

Introduction

Regulations state 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. Attempts at open pound *Macrocystitis* harvest in the Port Clarence District in 1991 and 1992 were unsuccessful.

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

Resource Investigations

Resource investigations of Port Clarence and Kotzebue Sound area herring stocks were conducted by ADF&G from March 1976-September 1978 (Barton 1978). These studies indicated 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.
<i>Zostera</i> sp. primary spawning substrate.	<i>Fucus</i> 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 a spring harvest. However, no bait fishery has occurred since 1996 (Table 18).

Sac Roe Fishery

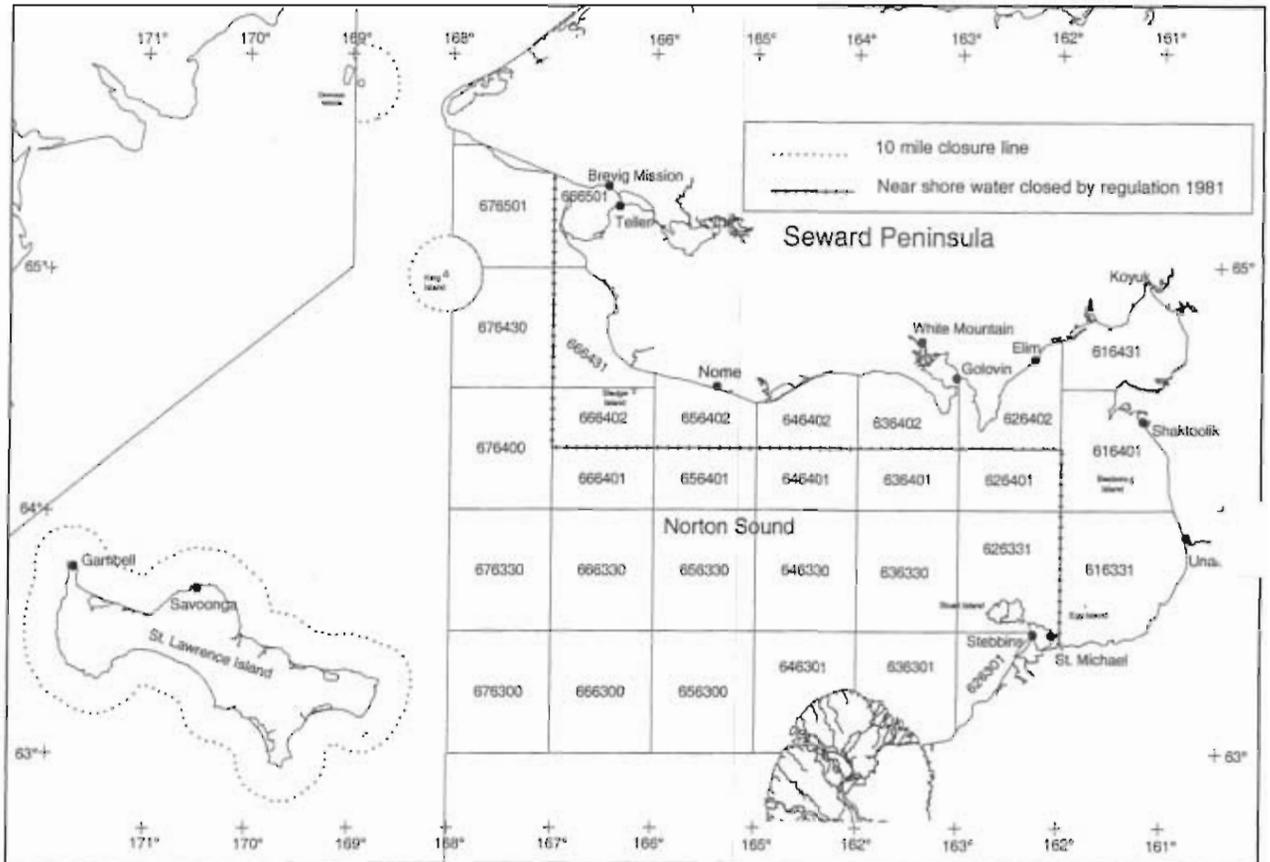
The Port Clarence fishers have been unable to attract a sac roe buyer for their relatively late fishery. During 1991 and 1992, one individual imported *macrocystus* kelp and attempted an open pound. No herring spawned on the imported kelp, although ripe herring were found in close proximity and very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

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

INTRODUCTION

Norton Sound

The Norton Sound Section (Q3) consists of all waters in Statistical Area Q north of the latitude of Cape Romanzof, east of 168° west longitude, and south of the latitude of Cape Prince of Wales (Map 6 , Figure 13).



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

A large vessel summer commercial crab fishery existed in the Norton Sound Section from 1977 through 1992. No summer commercial fishery occurred in 1991 due to a cut in staff the previous winter needed to manage the fishery. In 1992 the summer commercial fishery resumed. Appendix E1 shows the historical summer commercial harvest by year for the Norton Sound crab fishery. Regulation changes adopted during the March 1993 Board of Fisheries meeting changed participation in the fishery to that of small boats. A superexclusive designation went into effect for the Norton Sound commercial crab fishery June 27, 1994. This designation stated that a vessel registered for the Norton Sound crab fishery may not be used to take king crab in any other registration area during that registration year. Later a vessel moratorium put into place before the 1996 season had the intention of creating a license limitation program. The

Community Development Quota (CDQ) groups were allocated a portion of the summer harvest beginning in 1998. Although the CDQ allocation was in place, no harvest occurred until the 2000 season. The North Pacific License Limitation Program (LLP) went into effect for the Norton Sound crab fishery January 1, 2000. The program states that a vessel which exceeds 32 feet in length overall must hold a valid crab license issued under the LLP by the National Marine Fisheries Service.

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

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

Estimates of the legal red king crab biomass in Norton Sound, based on eight trawl surveys conducted between 1976 and 1999, have been standardized; accounting for design and coverage (Appendix Table E5). The Norton Sound legal red king crab biomass in 1976 was estimated to be roughly 1.7 million crab. By 1982, the legal biomass had fallen to 0.8 million crab because of a lack of recruitment and high harvest rates in the summer commercial fishery. The population then gradually recovered to an estimated 1.2 million legal crab in 1991. The trawl survey conducted during August of 1996 indicated a reduced stock size and estimated the legal biomass at 0.5 million crab. The surveys taken as a whole indicate there have been periods of weak and strong recruitment.

In 1999, the legal red king crab population of 1.5 million crab was estimated by a trawl survey to be near the historical high biomass (Appendix Table E5). The population level had nearly tripled since 1996. An all-time high prerecruit-1 male abundance (sublegal male crab with carapace length 90-104 mm) was also detected (Figure 14). This estimate indicated that the legal component would continue to expand at least for the 2000 fishery. Conversely, the exceptionally weak 1999 prerecruit-2 (sublegal male crab with carapace length 76-89 mm) abundance estimate suggested at least one year of weaker recruitment beginning during the 2001 summer fishery. The combination of the trawl survey conducted during the summer of 1999 and the winter king crab study of 2000 resulted in an estimate of 4.2 million pounds of legal crab for the 2000 summer fishery. These high numbers were the result of strong recruitment over the previous three years. The estimated legal male crab abundance for the 2001 summer commercial crab fishery was estimated at 3.8 million pounds. An eight percent exploitation rate equated to a guideline harvest

level (GHL) of 303,000 pounds of crab. This satisfied the harvest strategy set by the Board of Fisheries and also took into consideration the lower recruitment rate anticipated for the 2001 season. The Norton Sound CDQ crab allocation is 7.5% of the GHL. Therefore, 22,725 pounds of crab would be reserved for the CDQ fishery and 280,000 pounds would be the target goal for the open access fishery. The legal male biomass is now 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 somewhat 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.

St. Lawrence Island

The St. Lawrence Island Section (Q4) lies immediately west and north of the Norton Sound Section. Commercial catches in the St. Lawrence Island Section have only been reported for four years. In 1983, 52,557 pounds of blue king crab delivered from 13 landings. The commercial crab fleet concentrated their efforts near the southeast shore of St. Lawrence Island. In 1984 a regulation was adopted to close the waters within ten miles of all inhabited islands within the St. Lawrence Island Section (St. Lawrence Island, Little Diomedé and King Island). This regulation was put into place in an attempt to protect stocks targeted by local fishers and reduce impacts on marine mammal subsistence harvests. In 1989, 3,603 pounds of red king crab and 984 pounds of blue king crab were delivered from 8 landings. In 1992, 53 pounds of blue king crab were landed. In 1995 7,913 pounds of blue king crab were delivered from three landings.

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

2001 COMMERCIAL FISHERY

Norton Sound Summer Open Access Commercial Fishery

In the summer of 2001 the open access commercial crab fishery began by regulation on 12 noon, July 1 in the Norton Sound Section. Two companies registered to buy crab. One of these buyers operated a floating processor and purchased crab from local Norton Sound fishers. An independent observer was placed onboard this floating processor. Nonlocal fishers delivered to the second buyer located in Nome who flew live crab to markets in Dutch Harbor and Anchorage. Fishers also sold their catch dockside as catcher/sellers. The

open access portion of the fishery was closed by emergency order 12 noon, September 1, 2001 when the inseason estimate approached 280,000 pounds. The closure was done to enable the Norton Sound CDQ allocation to be harvested.

The total harvest from fish ticket reports was 98,321 red king crab or 288,199 pounds (Table 19). Of this total, 6,384 pounds were reported as deadloss and 3,645 pounds were reported as personal use. A total of 30 vessels made deliveries and 37 permit holders fished. Twenty of the vessels were considered local Norton Sound residents, ten were non-local. A total of 320 landings were made. Local boats accounted for 66 percent of the total crab harvest. The average weight for commercially caught crab was 2.9 pounds. A total of 1,200 pots were registered and there were 11,928 pot pulls throughout the fishery. The average price paid was \$2.34 per pound. The exvessel value of the fishery is estimated at \$674,385 (Appendix Table E3).

Fish ticket reports document that nine statistical areas were fished (Table 19). Statistical areas 636401 and 626401 had the highest catch with 91,343 and 61,620 pounds of crab respectively. The other large catches came from statistical areas 656401 (55,158 pounds), 666401 (43,771 pounds) and 656330 (20,869 pounds). The catch from statistical areas south of Golovin Bay (626401, 636330, and 636401) made up 54 percent of the harvest. All other statistical areas comprised 46 percent of the harvest. Overall, catch per unit effort (CPUE) was 8.2 crab per pot.

The first delivery was made on July 3. The final delivery was made September 13, 2001. Although the open access fishery ended 12 noon, September 1, some fishers had been holding storage pots offshore and had to wait for weather and available airplanes to make deliveries. The commercial crab fleet concentrated in two areas of operations throughout most of the open access fishery. Part of the fleet delivered to the floating processor anchored in Golovin Bay. The other portion of the fleet based their operations out of the Port of Nome and fishers sold crab locally or to the processor operating there. The floating processor ceased operations in Norton Sound on August 17. When it left the grounds, local fishers had to find their own markets and coordinate transportation of live crab to Nome. Many fishers relocated their efforts toward Nome, or pulled their gear and stopped commercial fishing. This slow down was seen in the lower harvest numbers after August 17. Fishers reported double shell and molting crab in the harvest beginning the third week of August.

CDQ Fishery

By regulation, the CDQ fishery is allocated 7.5% of the combined summer season harvest, which translated to 23,260 pounds for 2001. The Norton Sound and Lower Yukon CDQ groups divided this allocation. The CDQ fishery was opened by emergency order at 12 noon, September 2, 2001 and closed 12 noon, September 9, 2001. Only fishers designated by the Norton Sound and Lower Yukon CDQ groups are allowed to participate in this portion of the king crab fishery. Fishers must have a CDQ fishing permit from Commercial Fisheries Entry Commission (CFEC) and register their vessel

with ADF&G before they make their first delivery. Fishers operate under the authority of the CDQ group. The individual CDQ groups decide how the CDQ crab quota will be harvested.

Because this fishery occurred in September, the department had concerns that molting would make the crab unmarketable and increase mortality rates of crab returned to the water. The crab molt had begun during the last 2 weeks of August. The incidence of molting crab would only continue to increase during the month of September. The timing of the CDQ fishery was based on attempting to harvest crab while they still had good shell condition. Fishers that participated in the open access fishery and who intended to take part in the CDQ fishery were allowed to leave their pots in the water with doors open and bait containers removed until the CDQ fishery began.

No harvest was reported from the CDQ fishery. Fishers had deployed pots, or had left gear in the water from the open access fishery. Most fishers had not received their CDQ permits by the opening of the CDQ fishery. This delayed fishers from making deliveries when the weather was good. A request to extend the fishery was made by one of the CDQ groups on September 4. The department decided not to extend the fishery because of the biological concern of molting crab. Weather was good to fair until September 7, but no deliveries were made. Requests were made to extend the fishery because of poor weather and ocean conditions on September 8. The department chose to remain with the closing date of September 9 because of the continuing biological concern for molting crab.

Commercial Catch Sampling

Carapace length measurements and shell age were collected from 20,030 crab during the open access portion of the fishery. Carapace age was classified as new (2-12 months old) or old (over 13 months old). Recruit crab are new shell legal crab with carapace length < 116 mm. Postrecruit crab are legal new shell male crab with carapace length \geq 116 mm and all legal old shell males. Recruit crab made up 33 percent of the legal crab sampled and postrecruit crab made up 67 percent (Appendix Table E2). Male crab with new shell carapaces made up 90 percent of the total legal crab sampled, and old shell crab made up 11 percent. Overall mean carapace length of legal male crab was 119.3 mm .

Enforcement

The Nome Fish and Wildlife Protection officer was unable to patrol the fishery. No cases were filed during 2001.

Norton Sound Winter Commercial Fishery

A winter commercial fishery in the Norton Sound Section occurs from November 15 through May 15 and typically takes place near Nome. Vessels are prohibited and the winter

commercial fishery takes place from the ice. Stability of the sea ice greatly affects the success of the winter fishery. Appendix Tables E4 and E6 illustrates the winter commercial and subsistence harvest of crab from 1978 to 2001. During the winter of 2000-2001, three commercial fishers reported selling a total of 1,098 red king crab. Sea ice conditions were poor for the majority of the season. The first delivery was made January 20, 2001 and the last delivery was made May 12, 2001.

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 2001 winter catch of 1,098 crab was estimated to be worth about \$10,581. 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.

SUBSISTENCE FISHERY

Norton Sound residents utilize red king crab for subsistence mainly during the winter. Fishing occurs through cracks or holes cut in the ice with the use of handlines and pots. 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. Fishers record their daily effort and catch on these permits. During the 2001 season, fifty permits were issued in the Nome area, but only 12 permit holders fished (Table 20). A total of 254 crab were recorded kept for subsistence use in the Nome area. Unstable sea ice in the Nome area was the reason for poor harvests and why so few subsistence fishers took part in the fishery.

The first year subsistence permits were required had the highest number of permits issued and a relatively high harvest rate. The fishery declined sharply the following year and remained at 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 have 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 relatively high. 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 affected the 1987-88, 1988-89, 1992-93 and 2000-2001 catches.

During years of stable ice conditions, approximately 100 fishers have averaged 100 crab each.

FUTURE INVESTIGATIONS

A winter pot survey is planned during February, March and April of 2002. The results of the winter project will be used in the length-based model to project the summer 2002 legal biomass and appropriate GHL. The triennial Norton Sound Trawl Survey will take place in August of 2002. Results from the trawl survey will not be available until January 2003 and will be used to set the GHL in 2003.

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

INTRODUCTION

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

These fish are taken by set gillnets, beach seines, "jigging" through the ice, and rod and reel. Subsistence catches taken during the summer months are normally air dried, 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.

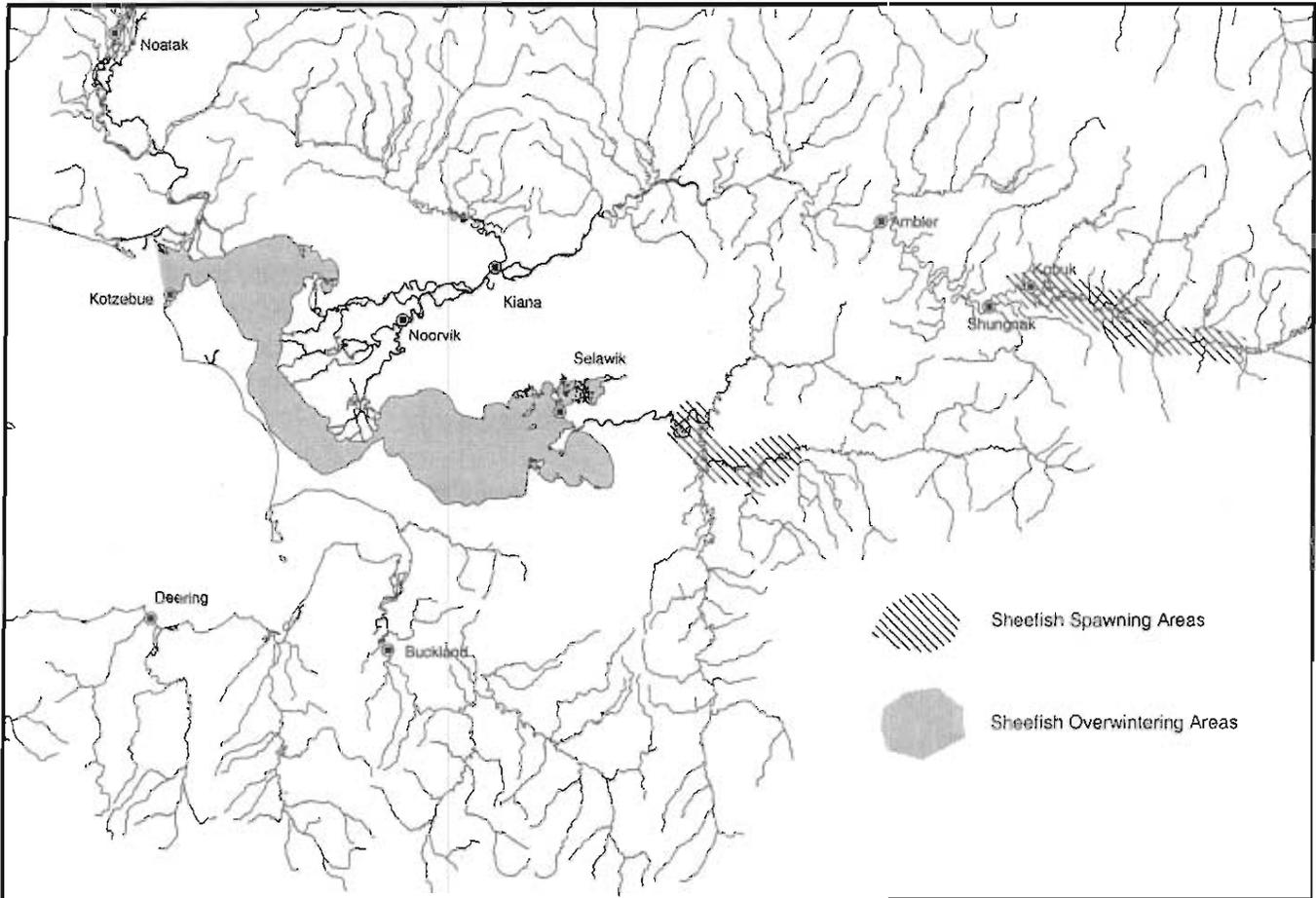
Subsistence harvest of most species is not limited by regulation. Commercial harvest may be prohibited in some freshwater areas, but limited commercial endeavors are allowed in many areas under terms of a permit.

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 to 7 inch stretched mesh which are set under the ice. Recorded commercial catches have remained relatively small; however, undocumented catches are believed to be significant and therefore, harvest totals should be considered minimum estimates. Restricted markets outside northwestern Alaska greatly limit commercial activity and most individuals who normally participate in the winter commercial fishery also fish for subsistence purposes. 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. Only 19 Sheefish (200 pounds) was reported harvested commercially in 2001 (Appendix Table FI).

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 chum salmon subsistence surveys conducted in the fall by Subsistence Division, and for Kobuk River residents may include winter as well as summer and fall catches. In 2001, the Kobuk River communities harvested an estimated 3,836 sheefish. The mean harvests per household ranged from 1 sheefish in Kobuk to 20 sheefish in Shungnak (Georgette *in press*). 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

Historically 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. Through the early 1990's 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 were declining.

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

1994. During the fall of 1995, roughly 617 sheefish were tagged in the Upper Selawik River and approximately 1,386 sheefish in the Upper Kobuk River. In 1996, 2,300 were tagged in the Upper Kobuk and 500 in the Selawik Rivers. The Selawik River project ended in 1996. In 1997, 1,757 sheefish were tagged in the Upper Kobuk River. Spawning population estimates of sheefish in the Upper Kobuk were 32,300 in 1995, 43,700 in 1996 and 26,782 in 1997. Sheefish spawn upstream of the village of Kobuk, 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. 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 begin migrating 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 Kotzebue, there was no incidental catch of Dolly Varden in 2001.

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 2001 an estimated 2,702 Dolly Varden were harvested for subsistence by the community of Noatak (Georgette *in press*). This was lower than the estimated harvests for Noatak from 1995-98 and 2000. 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. Surveys flown in the Kotzebue District in 2001 observed 92,614 Dolly Varden in the Wulik River. No surveys were flown on the Kivilina River (Appendix Table F6).

WHITEFISH

Introduction

Although inconnu belong to the whitefish family, this section deals with several smaller species of the genera *Coregonus* and *Prosopium*. The genus *Coregonus* contains the "broad" and "humpback" whitefish or *C. nasus* and *C. pidschian*, respectively. In addition, three whitefish species known as "ciscoes" belong to this genera; ie., the least cisco (*C. sardinella*), Arctic cisco (*C. autumnalis*) and Bering cisco (*C. laurettae*). "Round" whitefish (*Prosopium cylindraceus*) are 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 30,976 whitefish were harvested in 2001 for subsistence in the Noatak and Kobuk river villages (Appendix Table F7). Mean household harvests ranged from 25 whitefish in Noatak to 145 whitefish in Shungnak (*Georgette in press*).

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 2001.

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, 2001.

		Subdistricts						Total
		1	2	3	4	5	6	Number
Number of Fishers ^a		0	5	5	0	13	29	51
Chinook	Number	0	0	7	0	90	116	213
	Weight(lbs.)	0	0	59	0	1,712	2,032	3,803
Sockeye	Number	0	43	0	0	0	1	44
	Weight(lbs.)	0	344	0	0	0	9	353
Coho	Number	0	30	1,696	0	2,664	15,102	19,492
	Weight(lbs.)	0	229	13,398	0	20,964	117,702	152,293
Pink	Number	0	0	0	0	0	0	0
	Weight(lbs.)	0	0	0	0	0	0	0
Chum	Number	0	7,094	681	0	1,813	1,512	11,100
	Weight(lbs.)	0	51,324	4,617	0	13,045	10,572	79,558
Totals	Number	0	7,167	2,384	0	4,567	16,731	30,849
	Weight(lbs.)	0	51,897	18,074	0	35,721	130,315	236,007

^a Some fishers may have fished more than one subdistrict.

Table 2. Tier I subsistence salmon harvest by Nome area fishers, Norton Sound, 2001.

	Number of Permits			Number of Salmon Harvested					Total
	Issued	Returned	Fished	Chinook	Sockeye	Coho	Pink	Chum	
Marine Waters	23	20	6	0	32	47	39	84	202
Nome River	23	19	3	0	0	2	0	0	2
Snake River	6	6	3	0	0	8	0	30	38
Eldorado River	13	13	8	0	0	21	6	211	238
Flambeau River	4	4	1	0	0	67	0	3	70
Bonanza River	4	4	0	0	0	0	0	0	0
Safety Sound	3	2	1	0	0	20	0	1	21
Solomon River	1	0	0	0	0	0	0	0	0
Penny River	0	0	0	0	0	0	0	0	0
Cripple Creek	0	0	0	0	0	0	0	0	0
⊗ Sinuk River	3	3	2	0	0	27	0	0	27
Feather River	0	0	0	0	0	0	0	0	0
Fish River	1	1	1	0	0	66	0	0	66
Niukluk River	9	9	7	2	0	70	0	2	74
Port Clarence	0	0	0	0	0	0	0	0	0
Kuzitria River	1	1	1	0	4	0	0	6	10
Pilgrim River	19	14	7	3	165	20	0	0	188
Unknown River	0	0	0	0	0	0	0	0	0
Total	110	96	40	5	201	348	45	337	936

Table 3. Tier II subsistence salmon catches by Nome area fishers, Norton Sound, 2001

	Number of Permits			Number of Salmon Harvested					
	Issued ^a	Returned	Fished	Chinook	Sockeye	Coho	Pink	Chum	Total
Marine Waters	8	8	6	1	53	106	57	202	419
Nome River	0	0	0	0	0	0	0	0	0
Snake River	0	0	0	0	0	0	0	0	0
Eldorado River	5	5	5	1	4	57	6	281	349
Flambeau River	3	3	3	0	0	33	2	33	68
Bonanza River	1	1	1	0	0	7	8	6	21
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
Sinuk River	2	2	2	0	3	38	0	61	102
Feather River	0	0	0	0	0	0	0	0	0
Fish River	0	0	0	0	0	0	0	0	0
Niukluk River	0	0	0	0	0	0	0	0	0
Port Clarence	0	0	0	0	0	0	0	0	0
Kuzitrin River	0	0	0	0	0	0	0	0	0
Pilgrim River	0	0	0	0	0	0	0	0	0
Unknown River	10	10	2	0	0	28	3	64	95
Total	29	29	19	2	60	269	76	647	1,054

^a One Tier II fisher never picked up permit.

Table 4. Salmon survey counts of Norton Sound streams and associated salmon escapement goals (BEGs, OEGs and SEGs), 2001.

Stream Name	Chinook	Chinook SEG Range	Chum	Chum SEG Range	Coho	Coho SEG Range	Sockeye	Sockeye SEG Range	Pink	P SL
Salmon L.							9,400	Combined		
Grand Central R.							155 ^a	4,000 - 8,000 ^d		
Pilgrim R.	3				454		147			
Glacial L. ^b							2,487	800 - 1,600 ^d		
Sinuk R.			3,746	4,000 - 6,200	750		15		115	
Cripple R.			149		163					
Penny R.			6		16					
Snake R. ^b	33		2,182	1,600 - 2,500 ^c	1,335				1,295	
Nome R. ^b	7		2,859	2,900 - 4,300 ^c	2,418		55		3,138	13,000
Flambeau R.			3,612	4,100 - 6,300	213				4	
Eldorado R. ^b	50		11,635	6,000 - 9,200 ^c	1,509		2		8	
Bonanza R.	1		1,084	2,300 - 3,400	1,269				488	
Solomon R.			280	1,100 - 1,600	297					
Fish R.	8 ^a	Combined	3,220 ^a	Combined	1,055 ^a				1,744	
Boston Cr.	33 ^a	100 - 250 ^d	3,533 ^a	23,200 - 46,400 ^d	155 ^a				1,038	
Niukluk R. ^b	30		30,662		3,468	Combined			41,625	8,400
Ophir Cr.					162	950 - 1,900 ^d				
Kwiniuk R. ^b	252	300 - 550	16,598	10,000 - 20,000 ^f	9,532	650-1,300 ^d			8,423	12,500
Tubutulik R.	77 ^a		863 ^a	8,000 - 16,000 ^f						
Inglutalik R. ^c										
Ungalik R. ^c										
Shaktoolik R.	341	400 - 800 ^d	1,815							48
Unalakeet R. ^c		Combined		Combined						
Old Woman R. ^c		550 - 1,100 ^d		2,400 - 4,800 ^d						
North R. ^b	1,337	1,200 - 2,400	6,515		12,383	550-1,100 ^d			24,737	8,500

Note: Counts are aerial survey observation except where footnoted. A multitude of factors affect escapement estimates. The aerial survey observations above are strict values which are instantaneous counts that alone do not fully represent the strength of the run.

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

^b Preliminary expanded tower counts, except for Nome River and Glacial Lake which are weir counts.

^c No surveys were done either due to poor counting conditions or lack of aircraft or personnel.

^d Aerial survey goal.

^e The Board of Fisheries also established an OEG with the same range as the SEG.

^f Biological escapement goal. The Board of Fisheries has established an OEG of 11,500 - 23,000 for the Kwiniuk River and 9,200 - 18,400 for the Tubutulik River.

Table 5. Commercial salmon set gillnet catches from Golovin, Subdistrict 2, Norton Sound, 2001.

Period	Hrs. Fished	Date	No. of 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		
1	48	7/1-7/3	3			1,223	8.49			0	0.00			1,223	8.49			0			
2	48	7/5-7/7	4			2,316	12.06			0	0.00			3,539	10.53			0			
3	48	7/9-7/11	4			2,346	12.22			5	0.03			5,885	11.15			5		0.03	
4	48	7/12-7/14	3			1,209	8.40			0	0.00			7,094	10.56			5		0.01	
5	48	8/13-8/15	1			0	0.00			25	0.52			7,094	9.85			30		0.08	
6	48	8/20-8/22	0	NO FISHING EFFORT											7,094				30		
Total	288		5			7,094				30											

Table 6. Commercial salmon set gillnet catches from Moses Point, Subdistrict 3, Norton Sound, 2001.

Period	Hrs. Fished Date		No. of 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			
1	24	7/9-7/10	3	3	0.04	470	6.53			4	0.06	3	0.04	470	6.53			4	0.06	
2	24	7/12-7/13	3	4	0.06	208	2.89			1	0.01	7	0.05	678	4.71			5	0.03	
3	24	8/16-8/17	0	NO FISHING EFFORT																
4	24	8/21-8/22	2	0	0.00	3	0.06			961	20.02	7	0.04	681	3.55			966	5.03	
5	48	8/23-8/25	4	0	0.00	0	0.00			730	3.80	7	0.02	681	1.77			1,696	4.42	
Total	144		5	7		681				1,696										

Table 7. Commercial salmon set gillnet catches from Shaktoolik, Subdistrict 5, Norton Sound, 2001.

Period	Hrs. Fished	Date	No. of 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	
1	24	7/5-7/6	9	65	0.30	1,121	5.19			0	0.00	65	0.30	1,121	5.19			0		
2	24	7/9-7/10	9	19	0.09	481	2.23			0	0.00	84	0.19	1,602	3.71			0		
3	24	7/27-7/28	1	0	0.00	39	1.63			12	0.50	84	0.18	1,641	3.60			12	0.50	
4	24	7/30-7/31	6	1	0.01	77	0.53			157	1.09	85	0.14	1,718	2.86			169	1.01	
5	24	8/2-8/3	8	1	0.01	69	0.36			251	1.31	86	0.11	1,787	2.26			420	1.17	
6	48	8/6-8/8	2	0	0.00	0	0.00			238	2.48	86	0.10	1,787	2.01			658	1.44	
7	24	8/9-8/10	0	NO FISHING EFFORT																
8	48	8/13-8/15	5	0	0.00	1	0.00			274	1.14	86	0.08	1,788	1.59			932	1.34	
9	48	8/16-8/18	6	4	0.01	17	0.06			1,138	3.95	90	0.06	1,805	1.27			2,070	2.10	
10	48	8/20-8/22	4	0	0.00	6	0.03			212	1.10	90	0.06	1,811	1.13			2,282	1.94	
11	48	8/23-8/25	2	0	0.00	2	0.02			202	2.10	90	0.05	1,813	1.06			2,484	1.95	
12	24	8/27-8/28	2	0	0.00	0	0.00			180	3.75	90	0.05	1,813	1.03			2,664	2.02	
Total	408		13	90		1,813				2,664										

Table 8. Commercial salmon set gillnet catches from Unalakleet, Subdistrict 6, Norton Sound, 2001.

Period	Hrs. Fished	Date	# FM	Kings	Period Catch and Catch Per Unit Effort						Cumulative Catch and Catch Per Unit Effort						
					King CPUE	Chum CPUE	Pink CPUE	Coho CPUE	Kings	King CPUE	Chum CPUE	Pink CPUE	Coho CPUE				
1	24	7/5-7/6	13	80	0.26	368	1.18		0		80	0.26	368	1.18		0	
2	24	7/9-7/10	12	24	0.08	273	0.95		0		104	0.17	641	1.07		0	
3	24	7/27-7/28	12	2	0.01	267	0.93		532	1.85	106	0.12	908	1.02		532	1.85
4	24	7/30-7/31	10	1	0.00	80	0.33		302	1.26	107	0.09	988	0.88		834	1.58
5	24	8/2-8/3	9	0	0.00	82	0.38		487	2.25	107	0.08	1,070	0.80		1,321	1.78
6	48	8/6-8/8	10	3	0.01	147	0.31		3,410	7.10	110	0.06	1,217	0.67		4,731	3.87
7	24	8/9-8/10	13	0	0.00	110	0.35		2,746	8.80	110	0.05	1,327	0.62		7,477	4.87
8	48	8/13-8/15	15	1	0.00	48	0.07		2,539	3.53	111	0.04	1,375	0.48		10,016	4.44
9	48	8/16-8/18	17	1	0.00	43	0.05		1,952	2.39	112	0.03	1,418	0.39		11,968	3.90
10	48	8/20-8/22	17	2	0.00	55	0.07		1,497	1.83	114	0.03	1,473	0.33		13,465	3.46
11	48	8/23-8/25	15	2	0.00	24	0.03		1,122	1.56	116	0.02	1,497	0.29		14,587	3.17
12	24	8/27-8/28	13	0	0.00	15	0.05		515	1.65	116	0.02	1,512	0.27		15,102	3.07
Total	408		29	116		1,512			15,102								

Table 9. Norton Sound area subsistence salmon harvests, 2001.

			Chinook		Chum		Pink		Sockeye		Coho		Total	
	Total HH's	HH's Contacted	Reported Harvest	Est. ^a Total										
Nome Permits ^b	99	84	2	2	858	858	113	113	92	92	425	425	1,490	1,490
Subdistrict 1	99	84	2	2	858	858	113	113	92	92	425	425	1,490	1,490
Golovin	44	39	60	65	1,111	1,206	155	168	63	68	183	199	1,572	1,707
Niukluk R. Permits ^b	10	8	2	2	2	2	0	0	0	0	124	124	128	128
White Mountain	65	63	21	21	2,037	2,083	1,463	1,497	4	4	544	557	4,069	4,163
Subdistrict 2	119	110	83	89	3,150	3,291	1,618	1,665	67	72	851	880	5,769	5,997
Elim	80	69	390	427	820	898	1,269	1,390	64	70	1,224	1,352	3,767	4,137
Subdistrict 3	80	69	390	427	820	898	1,269	1,390	64	70	1,224	1,352	3,767	4,137
Koyuk	82	69	401	460	3,887	4,445	4,543	5,203	12	14	242	276	9,085	10,397
Subdistrict 4	82	69	401	460	3,887	4,445	4,543	5,203	12	14	242	276	9,085	10,397
Shaktoolik	60	51	898	936	1,489	1,553	9,757	10,172	137	143	1,962	2,090	14,244	14,895
Subdistrict 5	60	51	898	936	1,489	1,553	9,757	10,172	137	143	1,962	2,090	14,244	14,895
Unalakleet ^c	205	140	1,946	2,810	1,616	2,918	7,773	11,279	257	359	4,332	6,270	15,924	23,637
Subdistrict 6	205	140	1,946	2,810	1,616	2,918	7,773	11,279	257	359	4,332	6,270	15,924	23,637
Stebbins	124	107	500	570	3,509	3,999	178	202	0	0	2,420	2,759	6,607	7,530
St. Michael	90	74	246	283	1,982	2,246	204	229	12	17	437	490	2,880	3,264
South Norton Sound	214	181	746	852	5,491	6,244	382	431	12	17	2,857	3,250	9,487	10,793
NORTON SOUND	859	704	4,466	5,576	17,311	20,207	25,455	30,253	641	767	11,893	14,543	59,766	71,346

NOTE: Includes salmon from subsistence nets, rod and reel, removal from commercial harvest, and test fisheries.

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

^b Alaska Department of Fish and Game, Division of Commercial Fisheries, permit returns, 2001. Data not expanded. Permits are not required for Niukluk River but some Nome residents obtain permits.

^c Unalakleet estimated harvests include 79 chinook, 643 chum, 415 pink, and 200 coho from the ADF&G test net fishery in addition to the survey results.

SOURCE: Alaska Department of Fish and Game, Division of Subsistence, household surveys, 2001.

Table 10. Subsistence salmon harvests, Port Clarence District, 2001.

			Chinook		Chum		Pink		Sockeye		Coho		Total	
	Total HH's	HH's Contacted	Reported Harvest	Est. ^a Total										
Brevig Mission	68	55	35	41	889	1,041	400	468	1,737	2,040	912	1,070	3,973	4,660
Pilgrim R. Permits ^b	20	14	3	3	6	6	0	0	169	169	20	20	198	198
Teller	72	61	35	40	754	863	627	715	1,301	1,483	183	209	2,900	3,310
PORT CLARENCE	160	130	73	84	1,649	1,910	1,027	1,183	3,207	3,692	1,115	1,299	7,071	8,167

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

^b Alaska Department of Fish and Game, Division of Commercial Fisheries, permit returns, 2001. Data not expanded.

Table 11. Commercial harvest of chum salmon, chinook salmon, and Dolly Varden by period (combined openings), Kotzebue District, 2001.

Period	Date	Hours Fished	Number of Fishermen	Chum			Chinook			Dolly Varden		
				Number	Pounds	Avg. Wt.	Number	Pounds	Avg. Wt.	Number	Pounds	Avg. Wt.
1	7/10-7/11	21	9	5,058	42,855	8.5	0	0	0.0	0	0	0.0
2	7/12-7/13	24	14	9,824	87,757	8.9	1	8	8.0	0	0	0.0
3	7/16-7/18	36	21	8,177	72,598	8.9	0	0	0.0	0	0	0.0
4	7/19-7/20	24	30	18,117	164,675	9.1	0	0	0.0	0	0	0.0
5	7/23-7/25	32	47	41,329	369,023	8.9	1	7	7.0	0	0	0.0
6	7/26-7/27	24	37	16,297	145,240	8.9	0	0	0.0	0	0	0.0
7	7/30-7/31	20	43	22,125	193,482	8.7	2	21	10.5	0	0	0.0
8	8/1-8/3	26	46	24,925	222,827	8.9	1	4	4.0	0	0	0.0
9	8/7-8/8	24	37	21,232	182,444	8.6	0	0	0.0	0	0	0.0
10	8/9-8/10	24	40	26,254	219,759	8.4	0	0	0.0	0	0	0.0
11	8/14-8/15	24	30	8,151	65,199	8.0	0	0	0.0	0	0	0.0
12	8/16-8/17	24	12	2,257	17,661	7.8	1	24	24.0	0	0	0.0
13	8/20-8/22	36	16	4,585	36,952	8.1	0	0	0.0	0	0	0.0
14	8/23-8/24	24	10	3,341	26,889	8.0	0	0	0.0	0	0	0.0
Totals		366	66	211,672	1,847,361	8.7	6	64	10.7	0	0	0.0

Table 12. Historical average age composition by period for 1979-2000 and 2001.

Kotzebue Sound commercial average catch and age composition, 1979-2000.

Period	Catch	Percent by Age				Catch by Age				Cumulative Percent by Age			
		3	4	5	6	3	4	5	6	3	4	5	6
1	2,771	0.4	35.3	58.9	6.0	11	977	1,632	167	0.4	35.3	58.9	6.0
2	4,789	0.8	40.6	52.7	5.5	37	1,943	2,524	262	0.6	38.6	55.0	5.7
3	9,567	1.2	42.6	50.2	5.9	119	4,075	4,807	566	1.0	40.8	52.3	5.8
4	16,312	1.2	50.5	44.3	4.3	190	8,232	7,224	697	1.1	45.5	48.4	5.1
5	20,161	1.1	49.1	44.2	5.2	231	9,901	8,901	1,051	1.1	46.9	46.8	5.1
6	26,239	1.7	54.9	40.0	3.3	456	14,405	10,482	871	1.3	49.5	44.6	4.5
7	31,575	2.6	58.7	35.9	2.9	825	18,519	11,346	916	1.7	52.1	42.1	4.1
8	34,275	3.9	60.9	31.9	2.7	1,332	20,889	10,949	941	2.2	54.2	39.7	3.8
9	33,851	4.9	61.0	31.7	2.8	1,645	20,639	10,722	943	2.7	55.5	38.2	3.6
10	36,924	5.5	63.3	29.5	1.9	2,027	23,355	10,881	697	3.2	56.8	36.7	3.3
11	21,676	10.1	65.1	22.7	1.5	2,192	14,112	4,929	317	3.8	57.5	35.4	3.1
12	13,030	11.1	61.3	25.3	2.0	1,442	7,991	3,294	266	4.2	57.7	34.9	3.1
13	8,966	9.6	63.1	25.2	2.1	859	5,653	2,261	192	4.4	57.9	34.6	3.0
14	6,351	9.4	62.4	26.7	1.3	598	3,965	1,698	83	4.5	58.0	34.4	3.0
15	2,745	5.1	66.0	27.1	1.5	140	1,812	744	41	4.5	58.1	34.3	3.0

Kotzebue Sound commercial catch and age composition, 2001.

Period	Catch	Percent by Age				Catch by Age				Cumulative Percent by Age			
		3	4	5	6	3	4	5	6	3	4	5	6
1	5,058	0.0	29.5	67.5	2.6	0	1,492	3,414	132	0.0	29.5	67.5	2.6
2	9,824	0.0	35.7	60.3	4.0	0	3,507	5,924	393	0.0	33.6	62.7	3.5
3	8,177	0.4	28.1	66.5	4.6	33	2,298	5,438	376	0.1	31.6	64.1	3.9
4	18,117	0.0	21.3	76.3	2.4	0	3,859	13,823	435	0.1	27.1	69.5	3.2
5	41,329	0.7	31.8	64.8	2.3	289	13,143	26,781	951	0.4	29.5	67.1	2.8
6	16,297	1.5	41.3	54.2	3.0	244	6,731	8,833	489	0.6	31.4	65.0	2.8
7	22,125	0.4	40.8	58.1	0.8	89	9,027	12,855	177	0.5	33.1	63.7	2.4
8	24,925	4.2	49.8	35.0	11.0	1,047	12,413	8,724	2,742	1.2	36.0	58.8	3.9
9	21,232	3.8	62.5	31.8	1.9	807	13,270	6,752	403	1.5	39.3	55.4	3.6
10	26,254	4.1	60.8	34.0	1.1	1,076	15,962	8,926	289	1.9	42.3	52.5	3.3
11	8,151	7.7	64.0	28.3	0.0	628	5,217	2,307	0	2.1	43.1	51.5	3.2
12	2,257	3.1	75.4	21.6	0.8	70	1,702	488	18	2.1	43.5	51.2	3.1
13	4,585	6.3	61.9	30.2	1.2	289	2,838	1,385	55	2.2	43.9	50.7	3.1
14	3,341	7.2	68.2	23.5	1.1	241	2,779	785	37	2.3	44.3	50.3	3.1

Table 13. Kobuk River chum salmon drift test fish mean daily and cumulative CPUE, 1993-2001.

Date	1993		1994		1995		1996		1997		1998		1999		2000		2001				
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.			
10-Jul							15.00	27.77	0.00	5.85	5.22	5.22					2.50	4.61	8.39	24.97	
11-Jul							98.38	126.15	5.31	11.16	0.85	6.07	0.00	0.00	3.44	8.05	20.07	45.04			
12-Jul	11.18	11.18			0.00	0.00	45.54	171.69	7.19	18.35	a	6.07	0.00	0.00	3.45	11.50	12.63	57.67			
13-Jul	14.22	25.40	0.00	0.00	0.93	0.93	74.29	245.98	a	18.35	15.89	21.96	0.00	0.00	2.54	14.04	17.32	74.99			
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	0.00	0.00	8.57	22.61	45.57	120.56			
15-Jul	35.08	81.05	2.58	5.26	2.77	6.50	83.75	329.73	3.65	28.25	14.07	43.56	0.00	0.00	0.87	23.48	38.86	159.42			
16-Jul	13.19	94.24	11.35	16.61	a	6.50	71.35	401.08	14.28	42.53	17.33	60.89	0.00	0.00	3.38	26.86	32.80	192.22			
17-Jul	17.27	111.51	a	16.61	0.00	6.50	55.49	456.57	15.17	57.7	5.07	65.96	4.26	4.26	12.77	39.63	48.77	240.99			
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	36.98	277.97			
19-Jul	10.71	122.22	12.4	36.17	9.89	18.20	54.74	601.17	17.98	91.8	a	74.98	5.89	18.63	19.51	62.72	67.08	345.05			
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	26.05	371.10			
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	29.51	400.61			
22-Jul	5.52	133.7	3.56	50.68	21.18	94.22	50.97	767.96	13.28	123.61	0.00	105.51	11.91	59.40	41.00	145.98	108.97	509.58			
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	50.79	560.37			
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	58.96	619.33			
25-Jul	a	169.91	14.38	81.55	40.16	213.42	76.80	1,028.01	21.57	178.83	24.68	187.1	28.73	119.17	22.98	199.87	80.59	699.92			
26-Jul	15.22	185.13	47.65	129.2	35.15	248.57	55.68	1,083.69	14.66	193.49	a	187.1	39.72	158.89	40.28	240.15	94.06	793.98			
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	95.06	889.04			
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	a	239.28	62.34	344.01	58.24	947.28			
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	54.33	1,001.61			
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	35.36	1,036.97			
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	38.63	1,075.60			
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	61.50	1,137.10			
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	16.55	1,153.65			
3-Aug	54.49	285.21	71.79	549.59	48.40	678.88	48.70	1,628.62	35.21	424.54	26.67	389.47	33.19	724.35	44.32	873.93	44.21	1,197.86			
4-Aug	44.23	329.44	108.98	658.57	53.00	731.88	65.93	1,694.55	26.67	451.21	42.35	431.82	74.23	798.58	77.14	951.07	30.71	1,228.57			
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	43.64	1,272.21			
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	30.00	1,302.21			
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	26.31	1,328.52			
8-Aug	a	457.86	62.75	883.62	44.02	872.24	146.94	2,073.28	45.07	599.00	16.40	467.90	a	1,072.14	93.37	1,188.12	34.40	1,362.92			
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	23.01	1,385.93			
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	54.85	1,440.81			
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	73.64	1,514.45			
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	47.23	1,561.68			
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	13.04	1,574.72			
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					0.00	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, 2001.

			Chinook		Chum		Pink		Sockeye		Coho		Total	
	Total HH's	HH's Contacted	Reported Harvest	Est. ^a Total										
Ambler ^a	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Kiana ^b	87	67	0	0	2,749	5,379	0	0	0	0	0	0	2,749	5,379
Kobuk	26	24	0	0	2,640	2,843	1	1	1	1	0	0	2,642	2,846
Kotzebue ^c	786	151	2	5	6,448	17,713	10	25	5	13	0	0	6,465	17,756
Noatak	96	68	0	0	1,687	2,326	0	0	0	0	84	116	1,771	2,442
Noorvik	108	56	4	6	10,288	16,444	6	10	0	0	406	652	10,644	17,112
Shungnak	46	42	0	0	4,055	4,310	0	0	0	0	0	0	4,055	4,310
KOTZEBUE SOUND	1,149	408	6	11	27,806	49,014	17	36	6	14	490	768	28,326	49,844

^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, 2001. Ambler was not surveyed.

^b Kiana estimated chum harvest includes 2,036 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, 2001.

Table 15. Daily observed peak biomass estimates of Pacific herring, Norton Sound District, 2001.

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
5/18/01	1	JM,WJ,BB	1.3	3	0	0.0	0.0	0.0	0.0					0.0
5/23/01	2	JM, WJ, LN	1.5	4	0	0.0	0.0	0.0	0.0					0.0
5/28/01	3	JM, BB, GK	1.1	4	0	0.0		0.0	22.8					22.8
6/1/01	4	JM, BB	2.8	3	0	0.0	0.0	0.0	0.0					0.0
6/4/01	5	JM, WJ	1.3	4	0	0.0	0.0	0.0	0.0					0.0
6/6/01	6	JM	2.8	2	0	0.0	0.0	0.0	0.0	5.0	0.0	0.0		5.0
6/7/01	7	JM, WJ, FB	2.5	3	0	0.0	0.0	0.0	0.0					0.0
6/10/01	8	JM, WJ, FB	1.8	4	0	0.0	0.0	0.0	164.7					164.7
6/11/01	9	JM, WJ	1.3	4	3	3.1		0.0	560.7					561.9
6/12/01	10	JM, WJ	0.9	4.5	3	2.5								0.0 ^a
6/13/01	11	WJ,BB	1.9	4	1	1.0	5,416.1	0.0						5,416.1
6/14/01	12	JM	2.0	3	51	7.5	4,974.0	789.0						5,763.0
6/16/01	13	WJ,BB	2.5	4.5	13	5.3								0.0 ^b
6/19/01	14	JM,BB	3.0	3	0	0.0	1,090.0	481.0	415.9					1,986.9 ^c
6/21/01	15	JM	4.5	3	13	1.1	9,231.5	0.0	28.3	0.0	60.6	1,088.8	1,142.1	11,551.3 ^a
6/25/01	16	WJ	1.7	4	0	0.0	0.0	0.0	317.0					317.0
Sum	-		32.7	4	84	20.5		Waste	0	Harvest	2,245.1	Total Harvest		2,245.1
												Survey		11,551.3
												Biomass		13,796.4

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

^a Survey was below 1500 feet

^b Survey was below 1500 feet but we did see fish

^c Primarily spawn outs

Table 16. Sac roe herring harvest and effort by date and subdistrict, Norton Sound District, 2001.

Date	<u>Subdistrict 1 (333-70)</u>			<u>Subdistrict 3 (333-74)</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 %
6/12				50	754	12.6	50	754	12.6
6/13	7	157	13.0				7	157	13.0
6/14	38	266	12.2	25	178	12.8	63	445	12.4
6/15	38	204	12.1	31	192	11.6	69	397	11.9
6/16	32	181	11.7	19	88	12.0	51	268	11.8
Total ^a	45	898	12.2	64	1,347	12.4	73	2,245	12.3

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

Table 17. Norton Sound commercial herring harvest by statistical area, by gear type, 2001.

Stat Area	Location	Gillnet			# fishers	Spawn On Kelp	
		Sac Roe (st) ^a	Avg. Roe %	Bait (st)		Pounds of Kelp	# fishers
333-70	Canal Point- Spruce Creek	898	12.2	0	45	4,400.0 ^b	3
333-74	Junction Creek- Island Point	1,347	12.4	0	64		
Totals		2,245	12.3	0	73	4,400.0	3

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

^b *Macrocystis* kelp.

Table 18. 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 <u>Combined Total</u>	56.4 st @7.6% 23.6 st @8.9% 80.0 st @8.2%	<u>\$1000/st @10%</u>	<u>\$ 57,500</u>
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) <u>Combined Total</u>	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 19. Commercial harvest of red king crab from Norton Sound Section by statistical area, Norton Sound District, 2001 (summer fishery only).

Statistical Area	Number	Pounds	Pots Pulled	CPUE	Average Weight (Lbs.)
626401	21,554	61,620	2,767	7.8	2.86
636330	804	2,253	113	7.1	2.80
636401	31,590	91,343	3,698	8.5	2.89
646330	623	1,868	80	7.8	3.00
646401	1,485	4,287	244	6.1	2.89
656330	7,297	20,869	731	10.0	2.86
656401	17,870	55,158	2,100	8.5	3.09
666330	2,443	7,030	312	7.8	2.88
666401	14,655	43,771	1,883	7.8	2.99
Total	98,321	288,199	11,928	8.2	2.9

Table 20. Winter 2000-2001 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 Fisherman
Pots	8	244	169	12	0	256	169	21
Handlines	0	0	0	0	0	0	0	0
Both	0	0	0	0	0	0	0	0
Unknown	4	106	85	4	0	110	85	21
Totals	12	350	254	16	0	366	254	21

Number of Permits given out= 50

Number of Permits returned= 27

^a Poor ice conditions. 50 permits were given out, 27 permits returned, 12 fished.

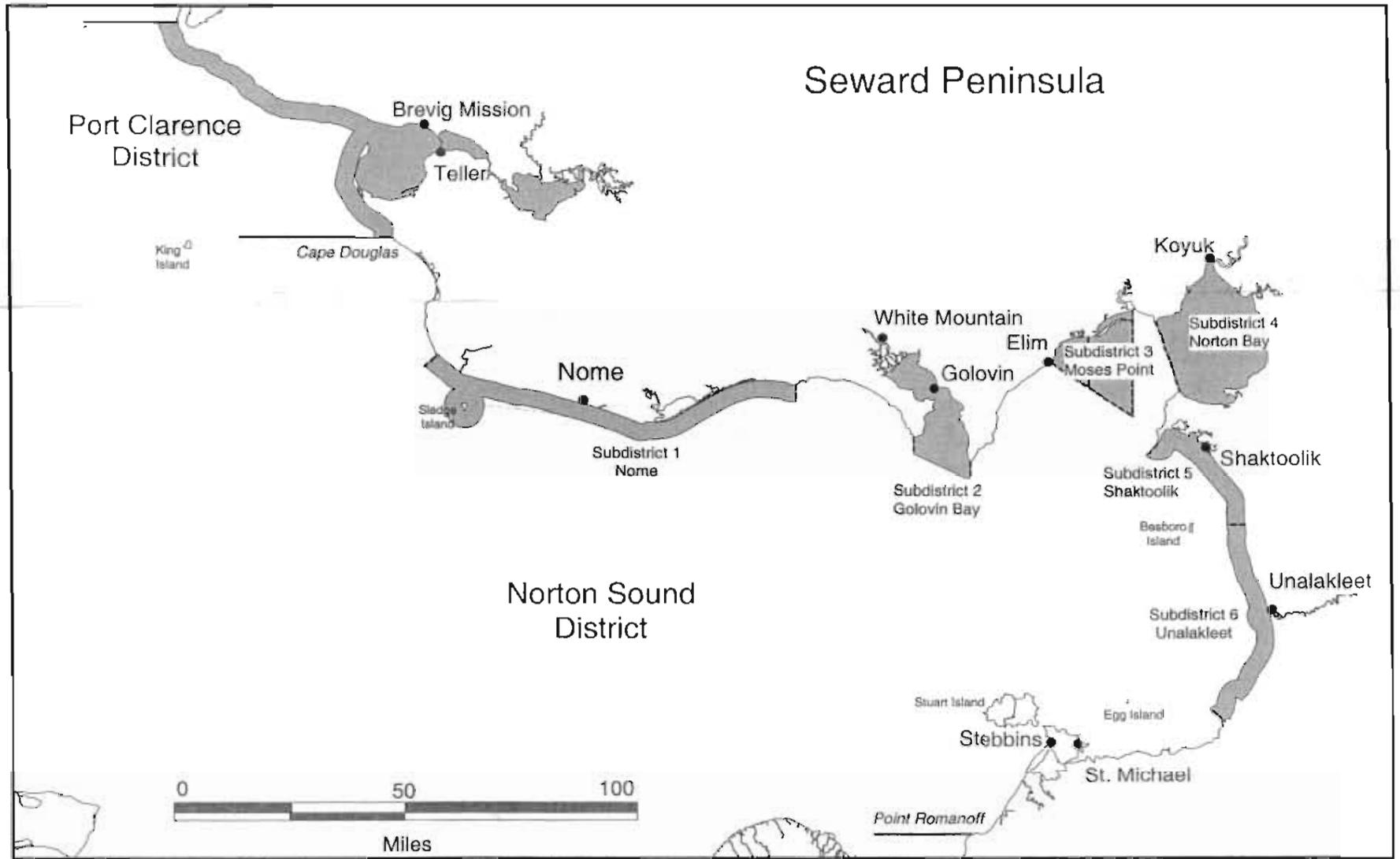


Figure 1. The commercial salmon fishing districts and subdistricts of Norton Sound and Port Clarence.

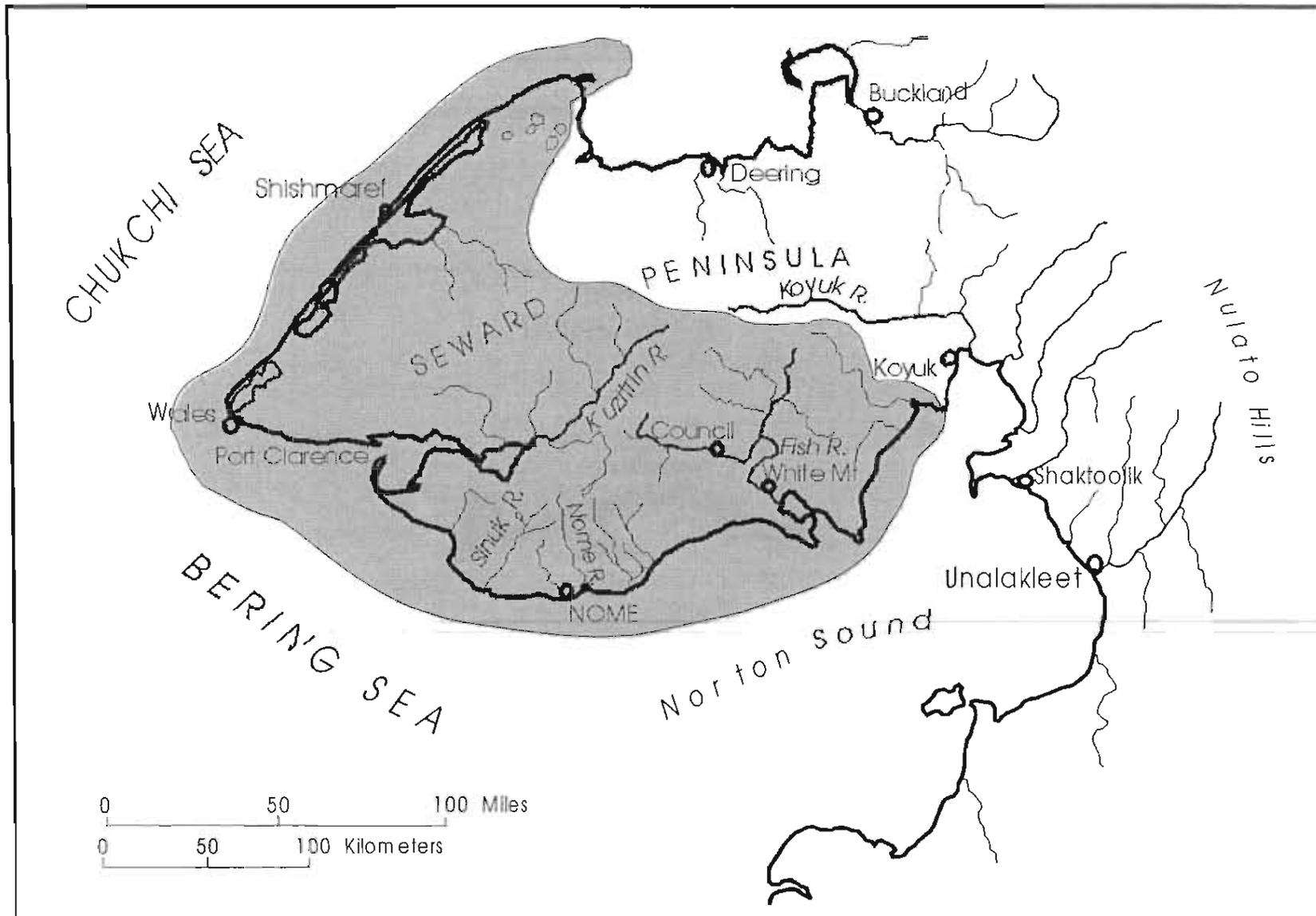


Figure 2. Map of Norton Sound with shaded area showing where a fishing pole is legal subsistence gear.

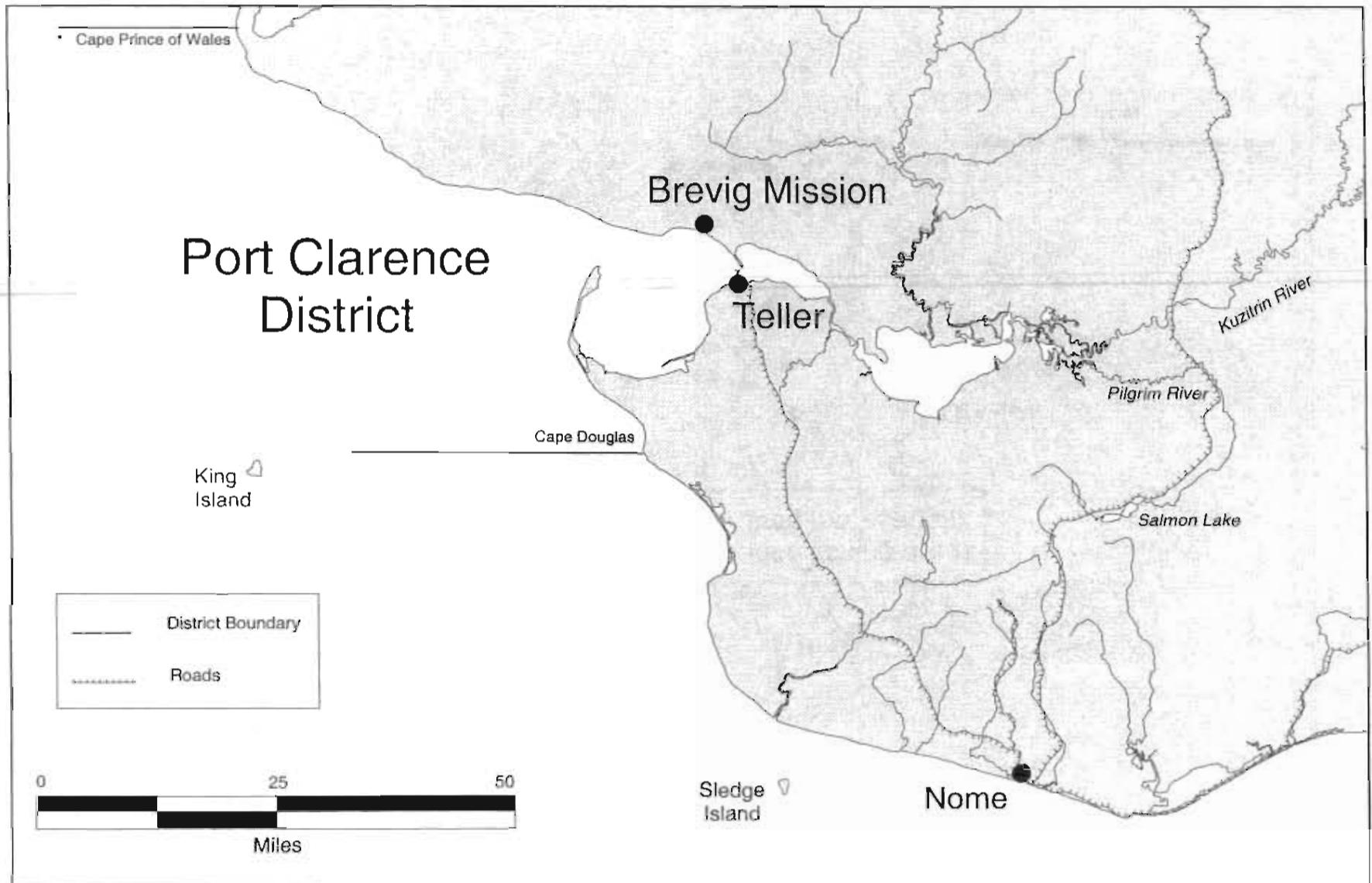


Figure 3. Port Clarence Salmon District.

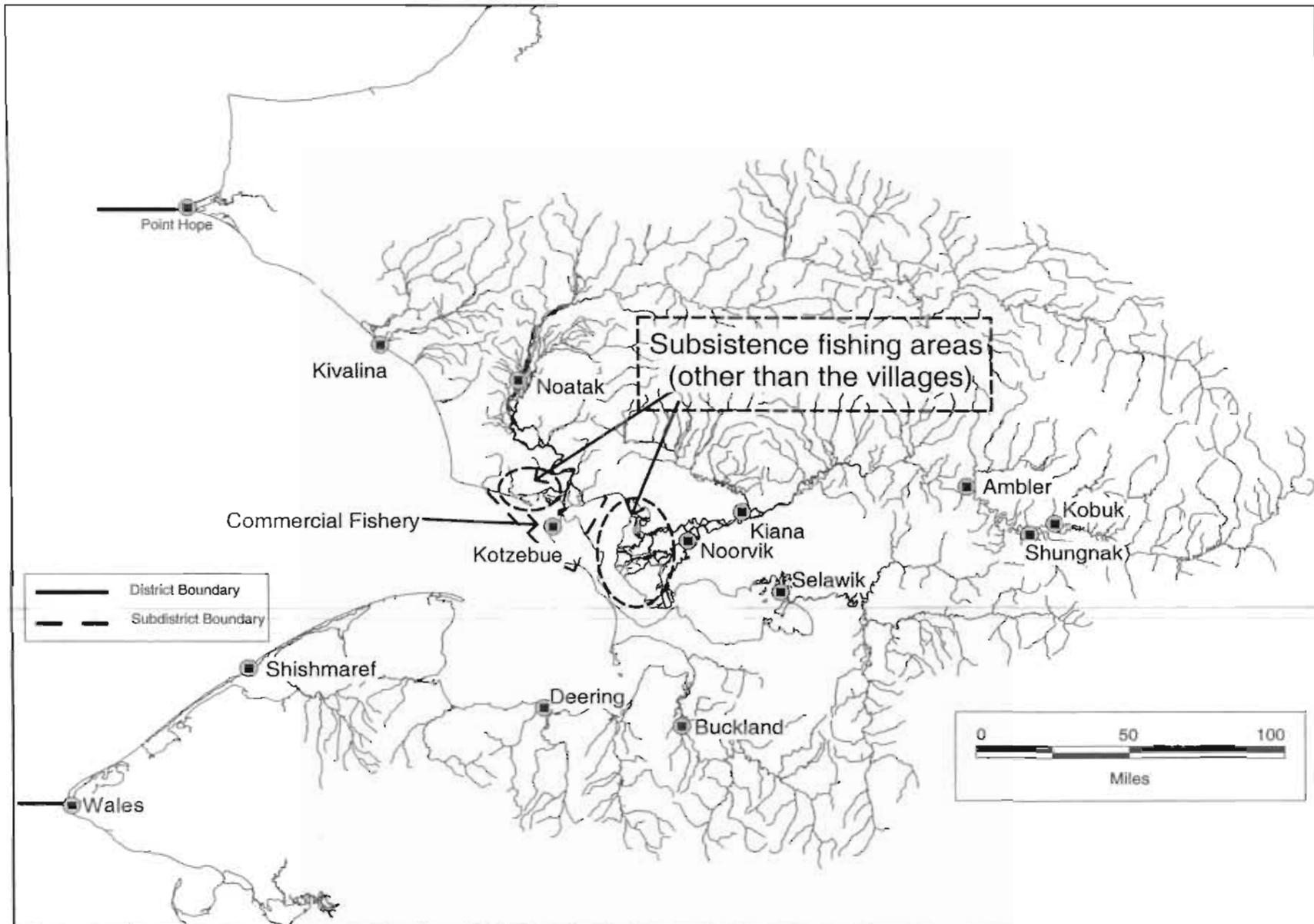


Figure 4. Kotzebue Sound salmon district, villages and subsistence fishing areas.

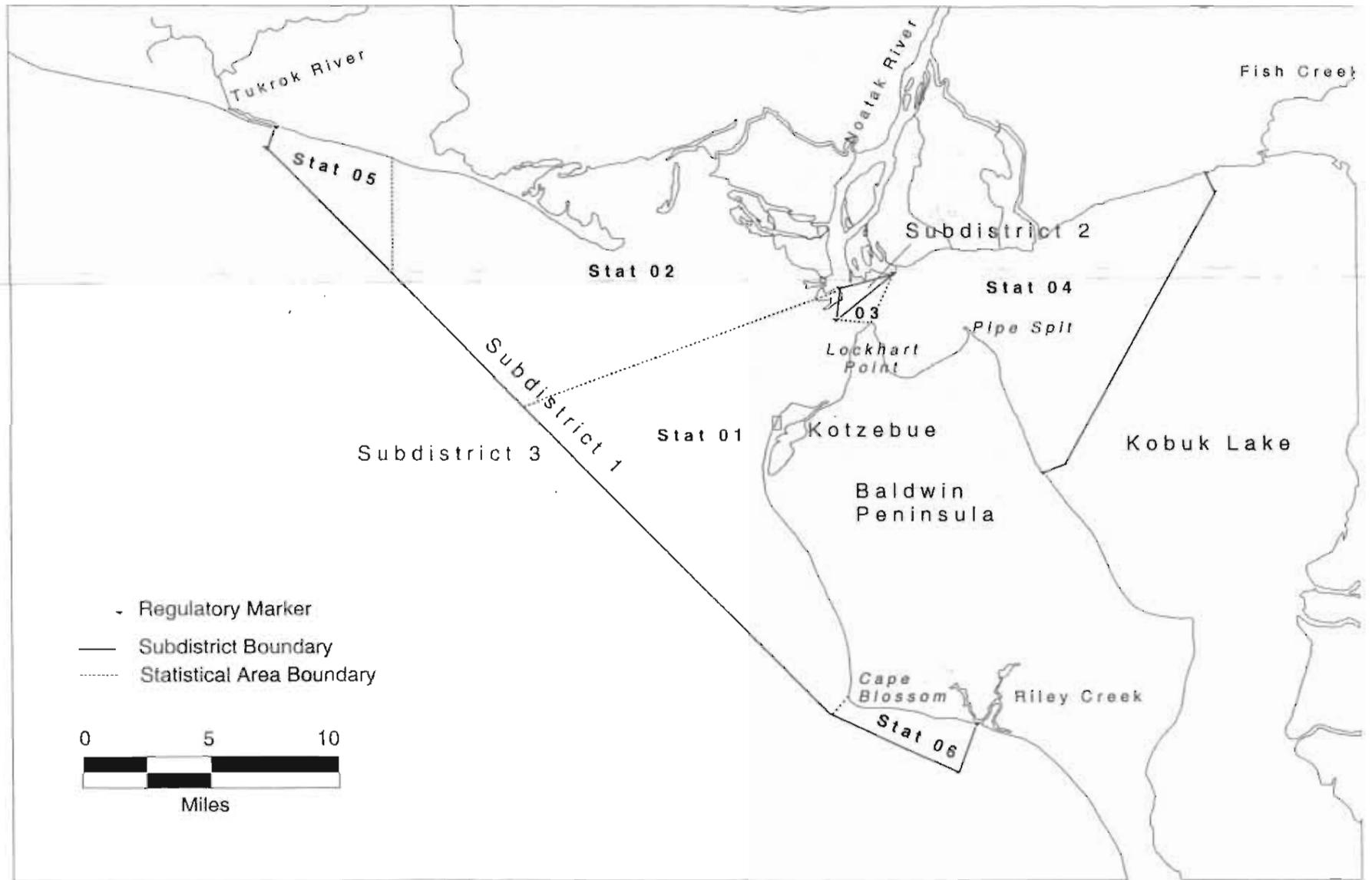


Figure 5. Kotzebue Sound salmon fishing subdistricts and statistical areas.

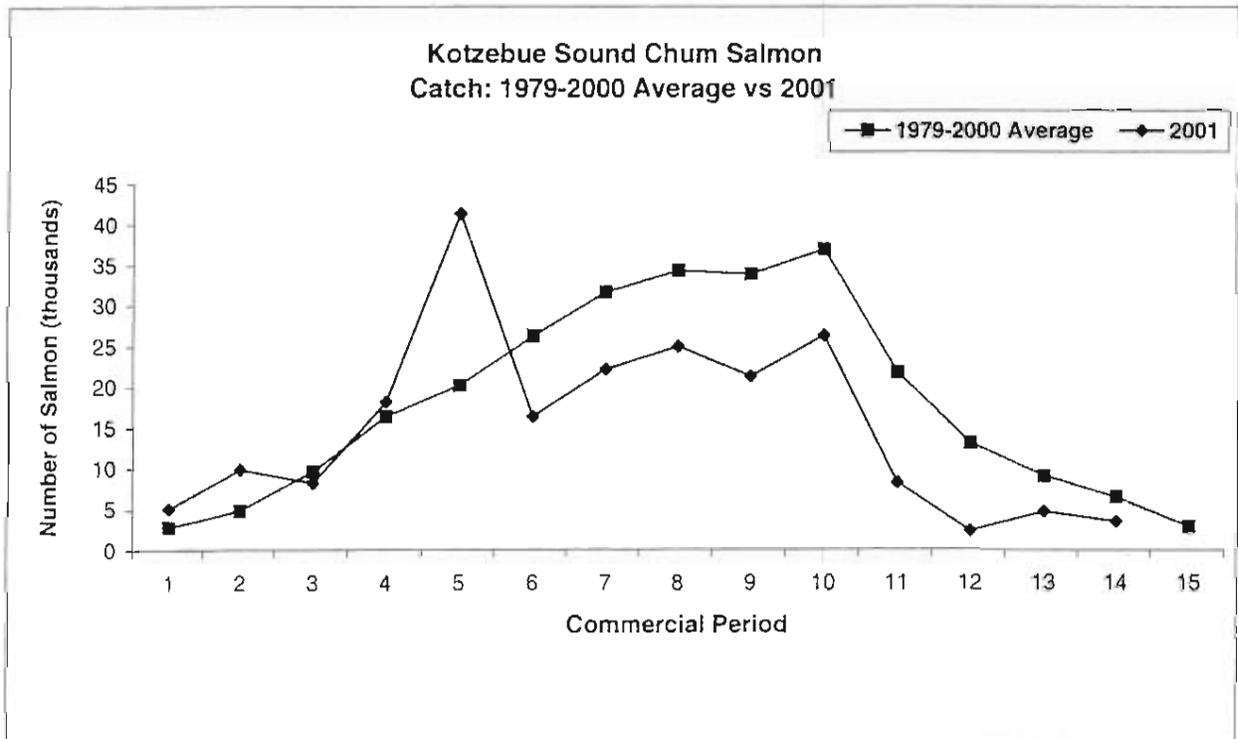
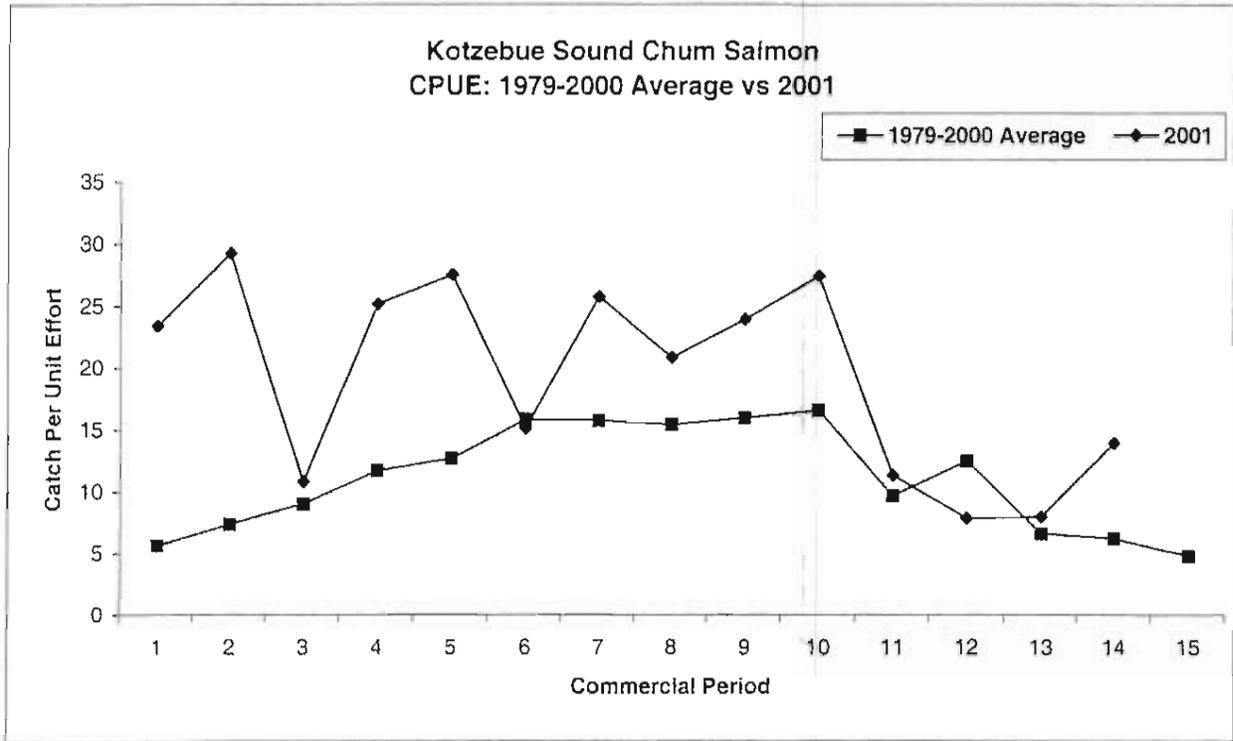


Figure 6. Kotzebue Sound CPUE and commercial chum salmon catch for 2001 vs. historical average.

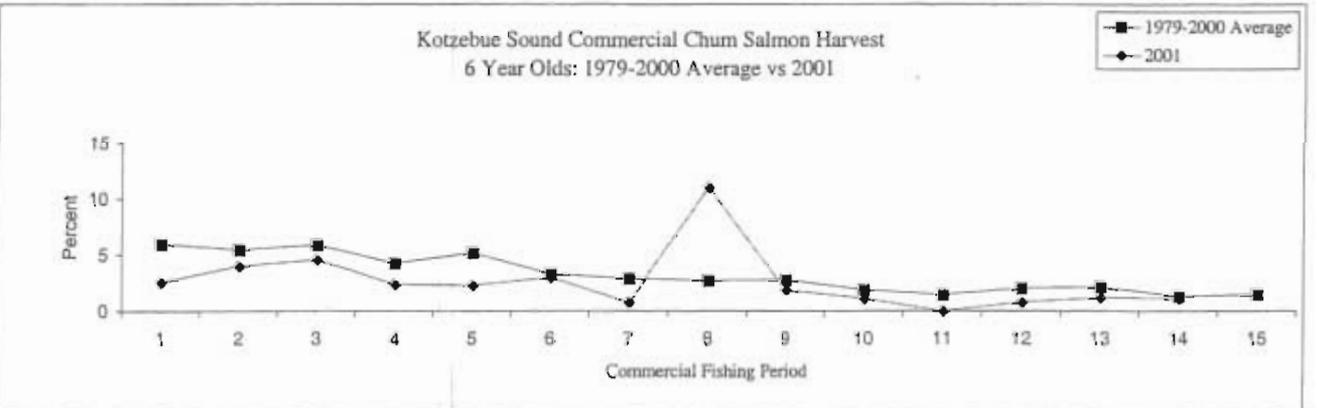
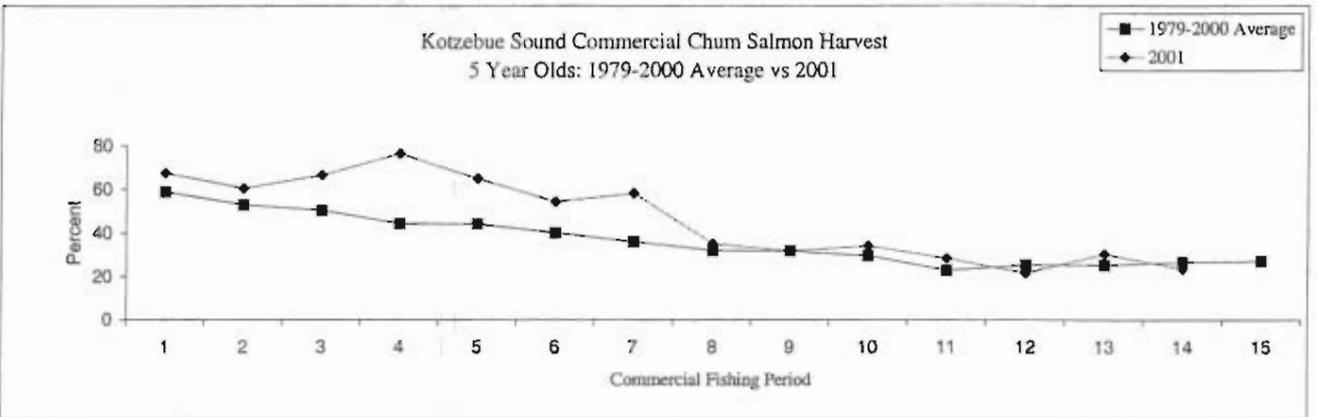
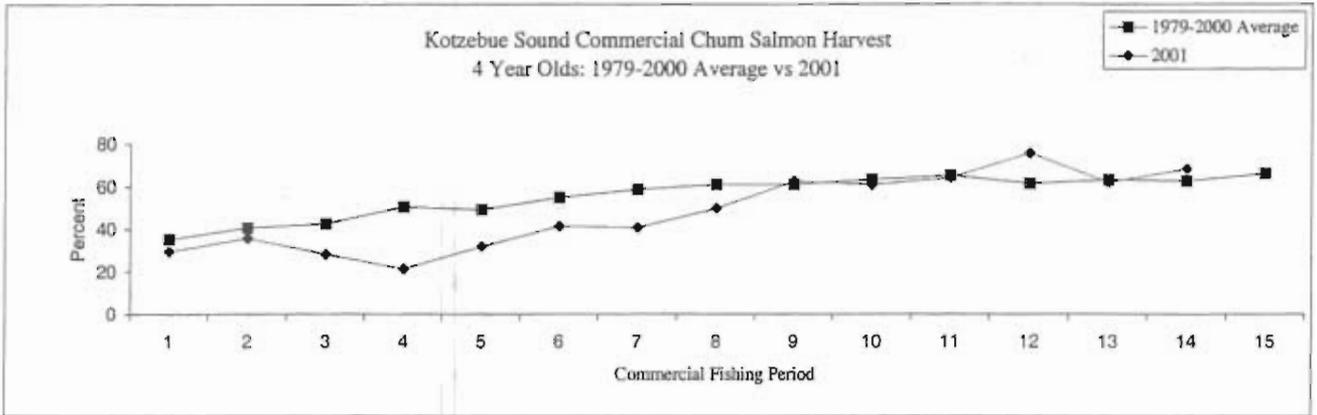
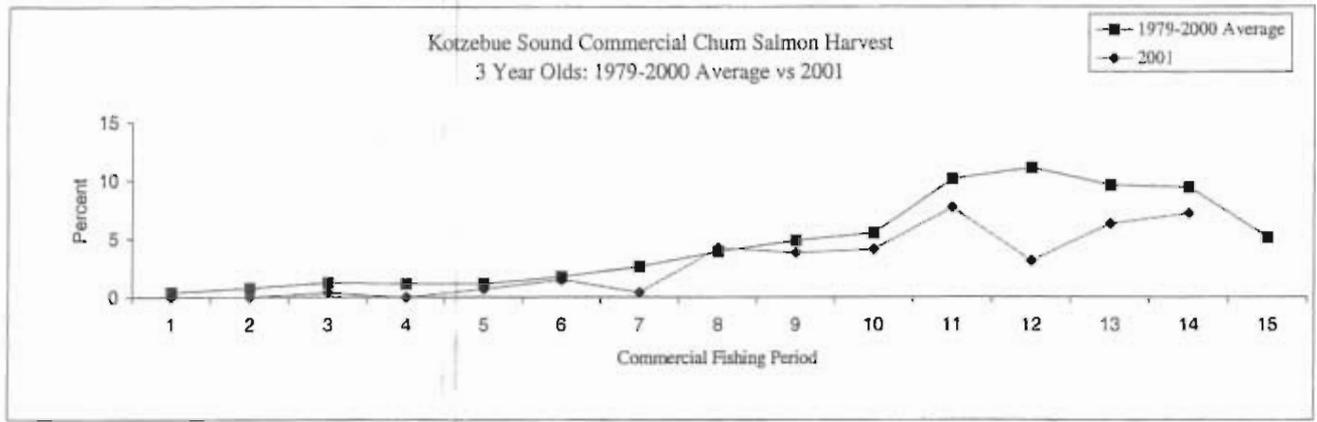


Figure 7. Age Composition of the Kotzebue Sound Commercial Chum Salmon Harvest.

Kobuk River Test Fish Cumulative CPUE

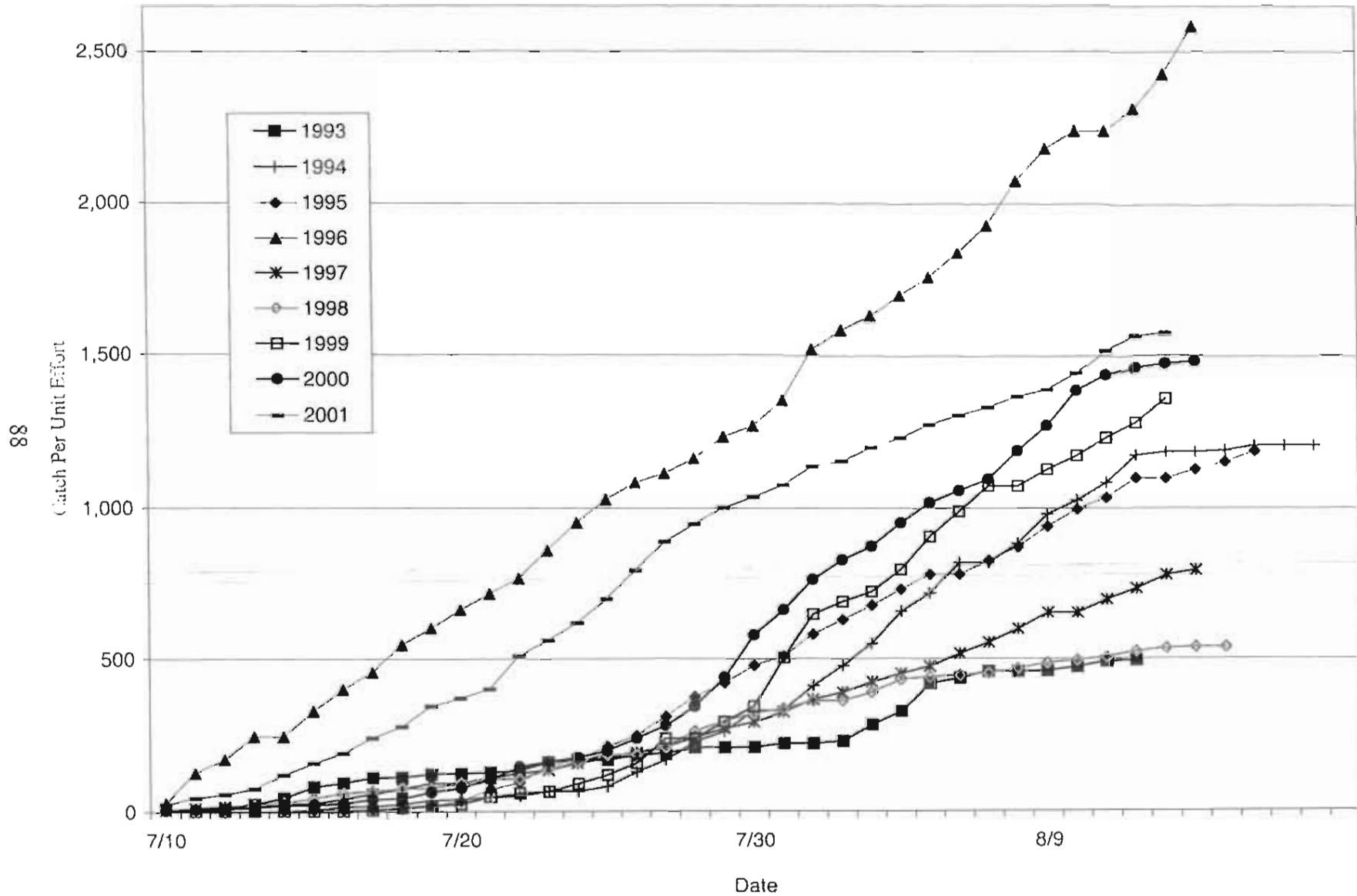


Figure 8. Kobuk River test fish cumulative Catch Per Unit Effort (CPUE), 1993-2001.

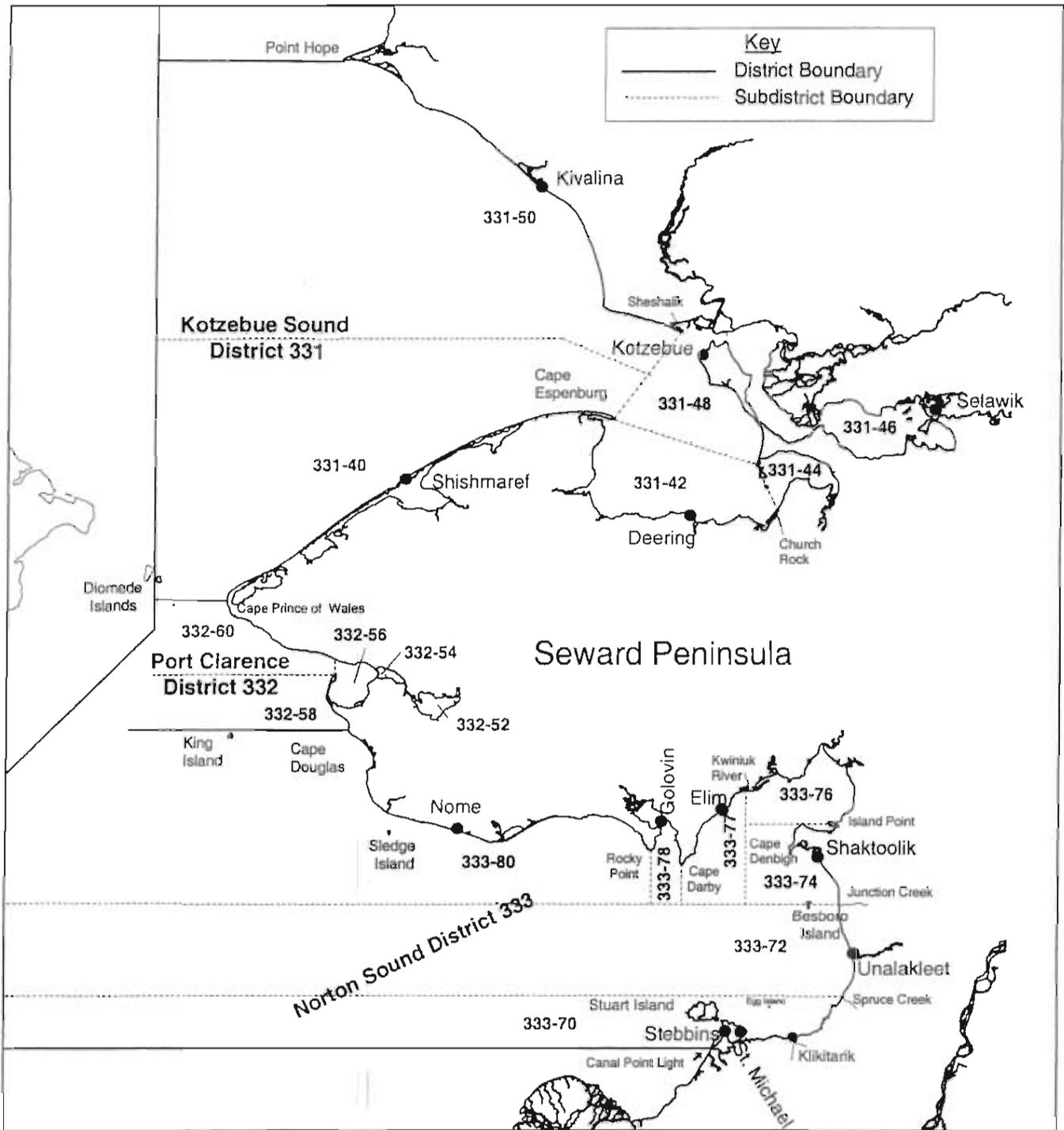


Figure 9. Statistical areas of the Norton Sound, Port Clarence and Kotzebue Sound commercial herring fishing districts.

Norton Sound District
Age Composition of Commercial Gear Combined

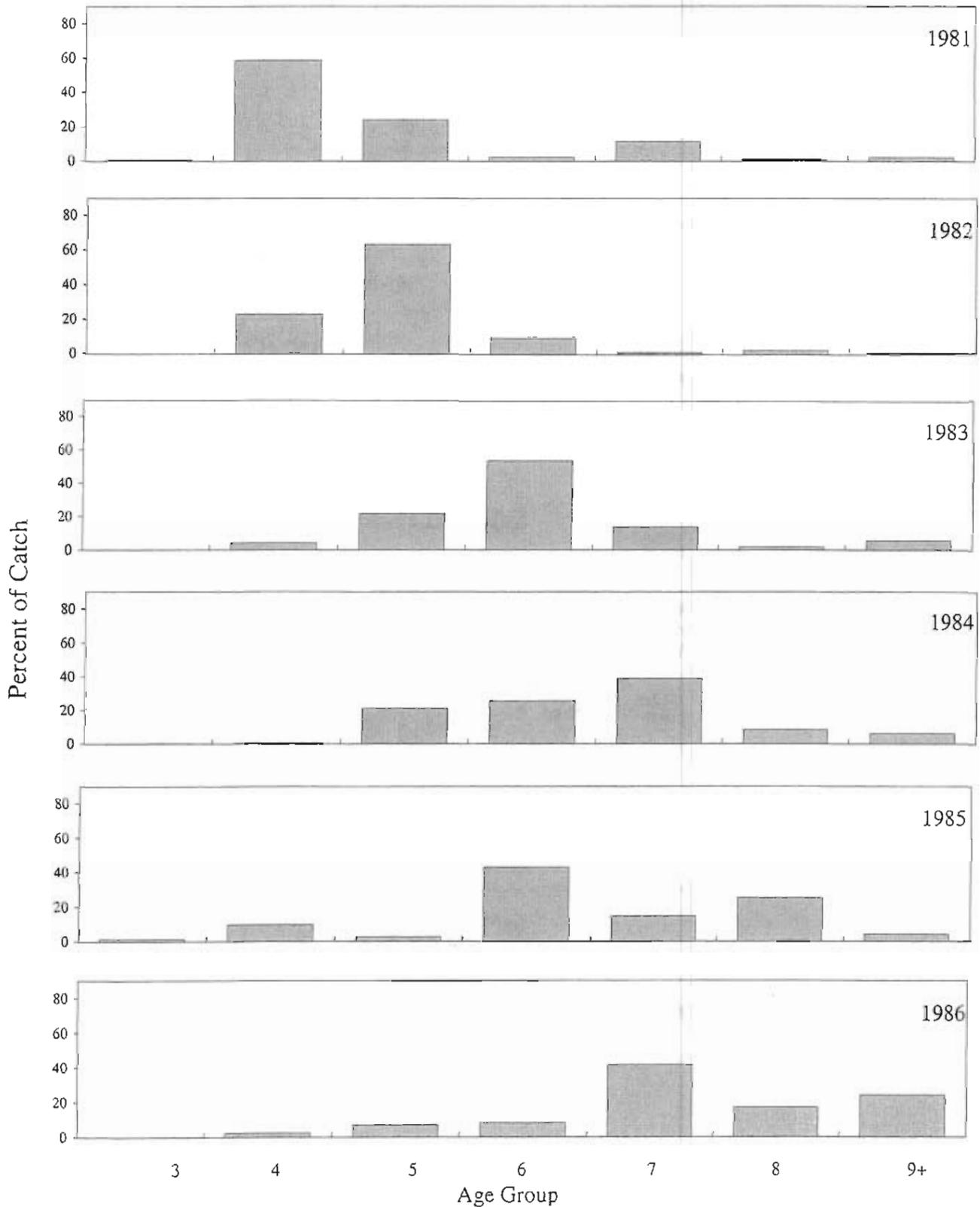


Figure 10. Norton Sound herring age class composition by percentage of commercial catch, commercial gear combined (beach seine and gillnet), 1981-2001. (page 1 of 4)

Norton Sound District
Age Composition of Commercial Gear Combined

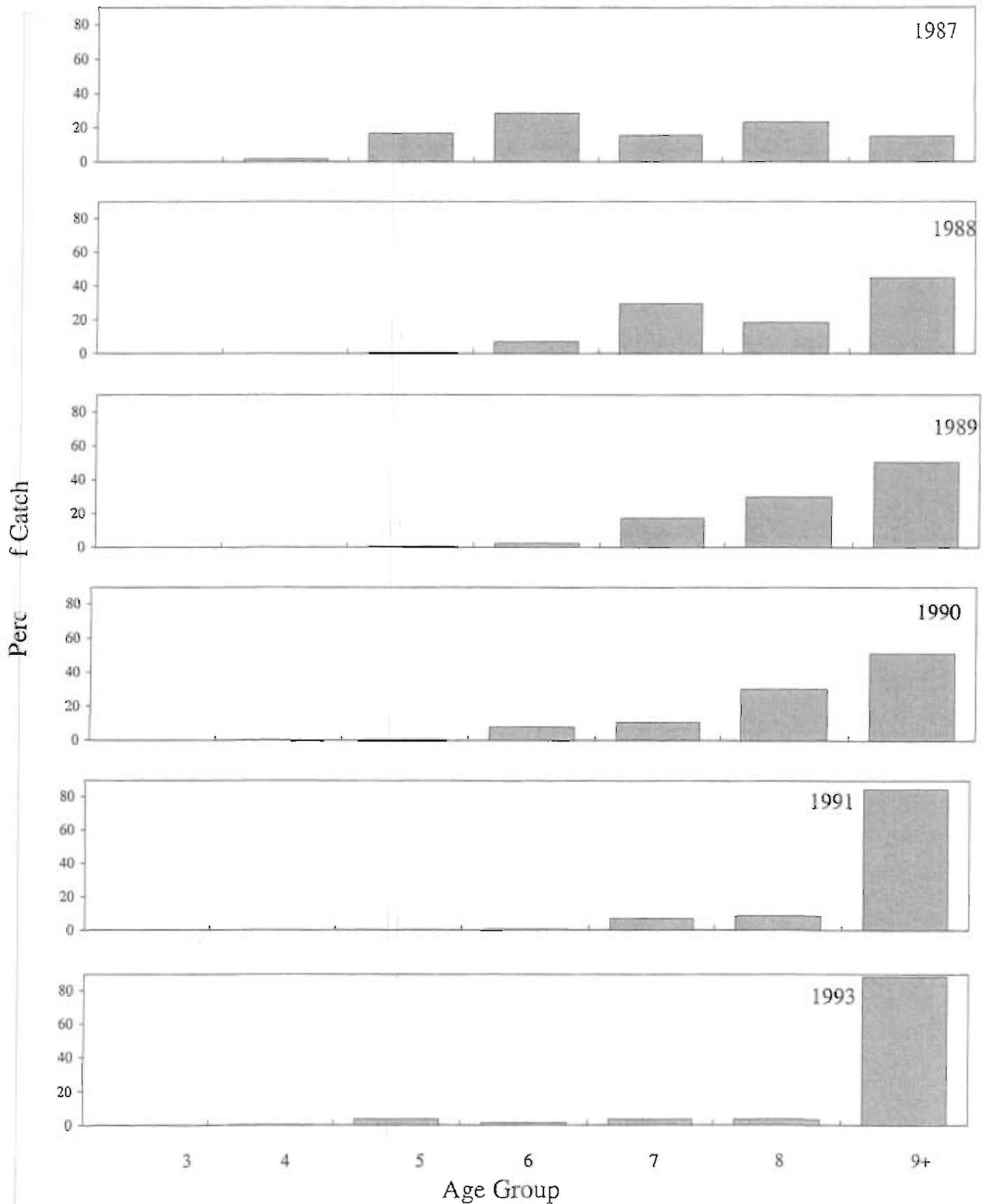


Figure 10. (page 2 of 4)
note: No commercial fishing occurred in 1992.

Norton Sound District
Age Composition of Commercial Gear Combined

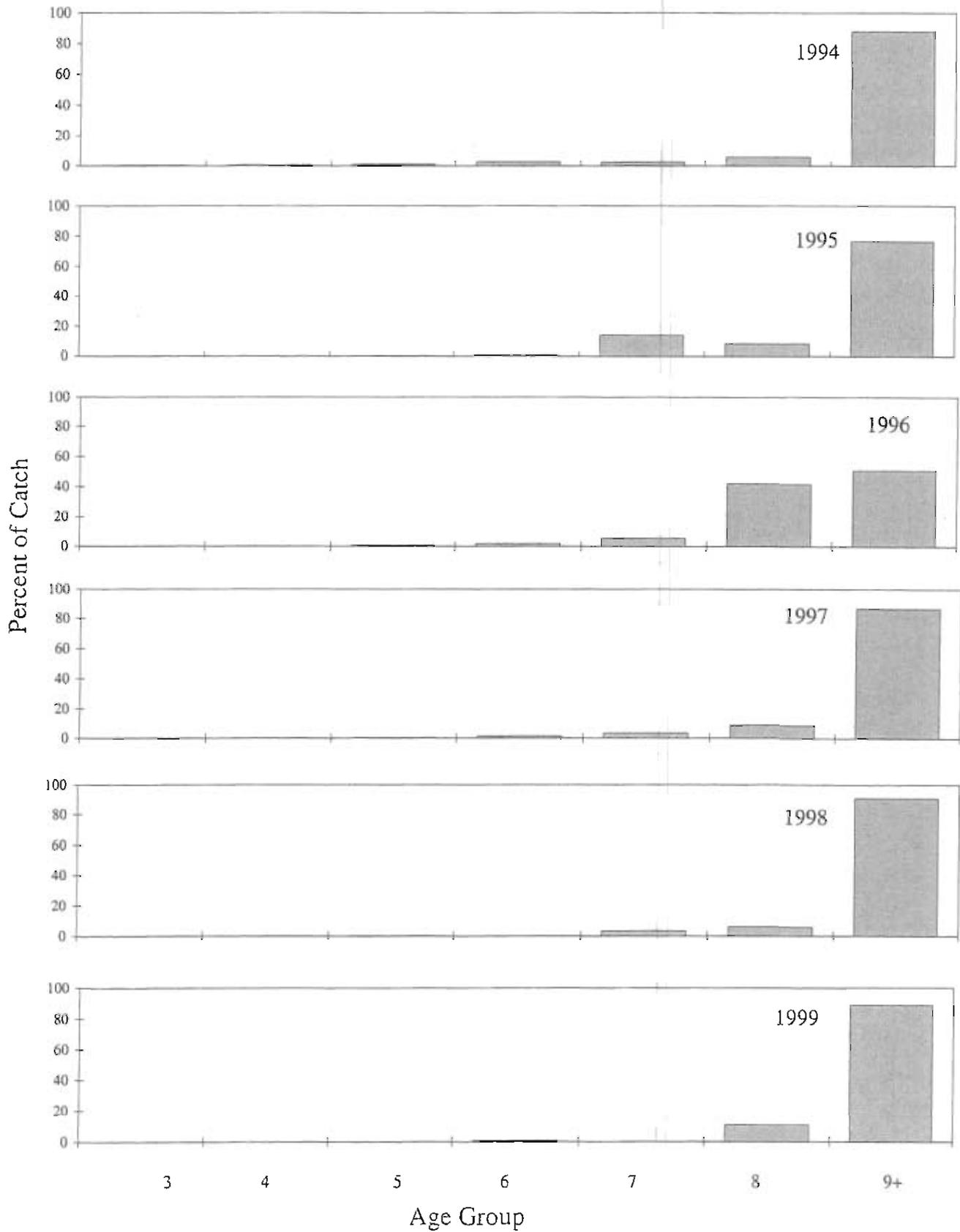


Figure 10. (page 3 of 4)

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

Norton Sound District
Age Composition of Commercial Gear Combined

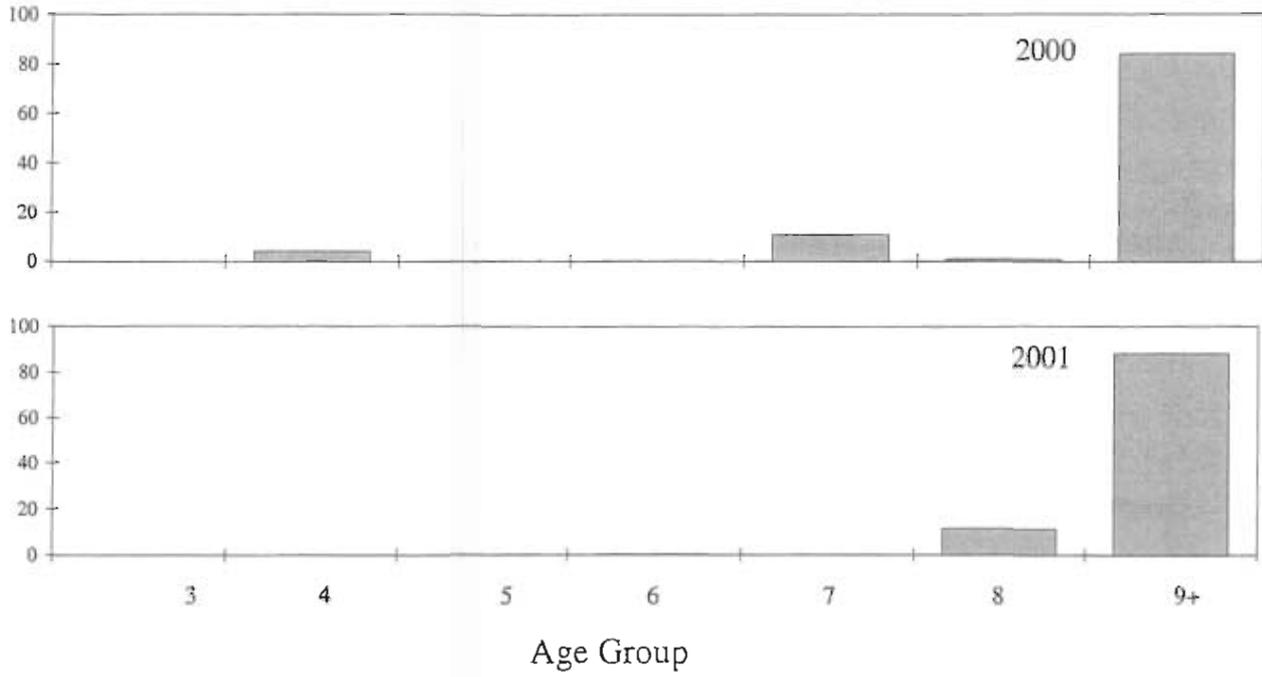


Figure 10. (page 4 of 4)

Note: No commercial catch from beach seine gear in 2001.

Norton Sound District
Age Composition of Variable Mesh Gillnets

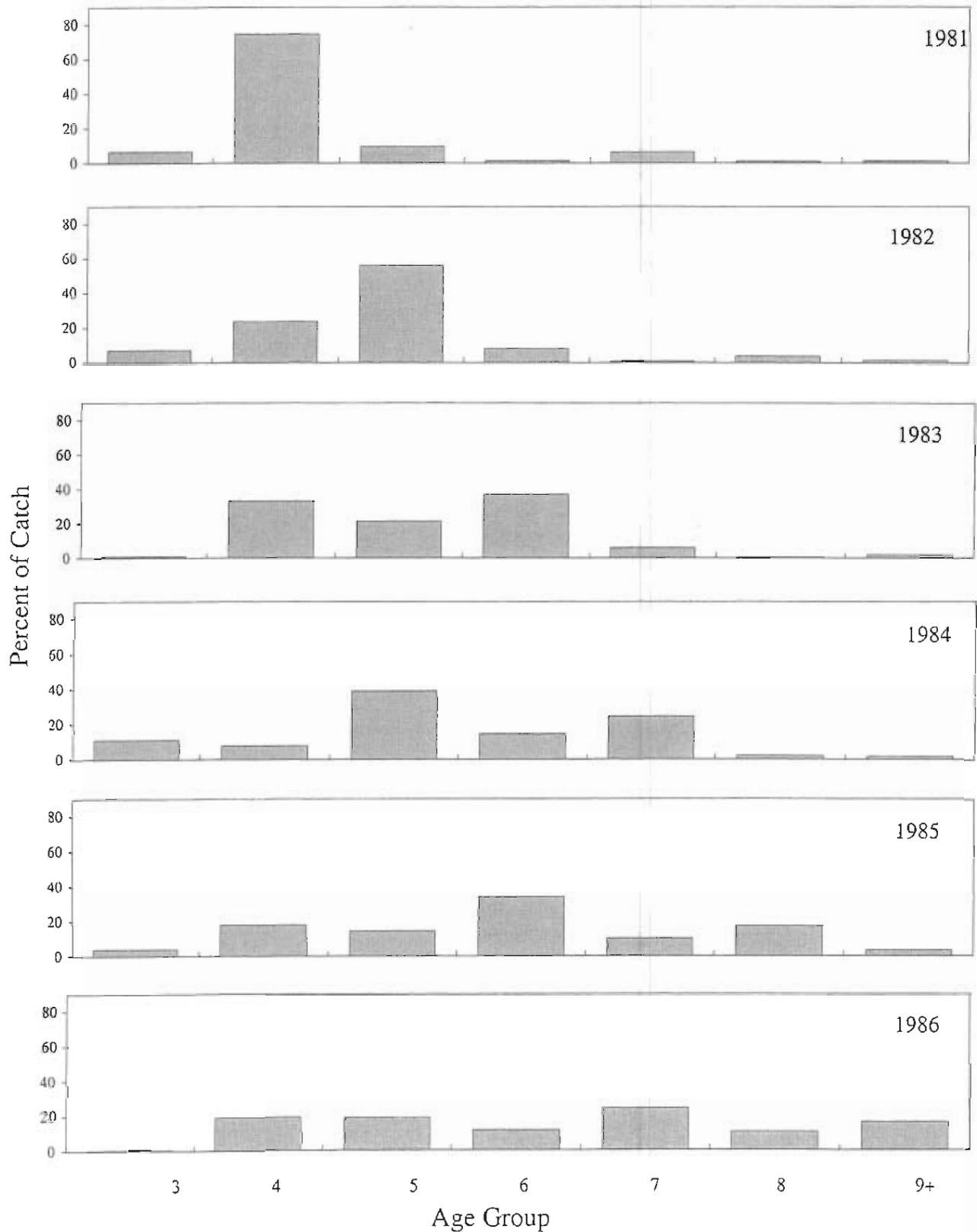


Figure 11. Norton Sound herring age class composition by percentage of total catch, variable mesh gillnets, 1981-2001. (page 1 of 4)

Norton Sound District
 Age Composition of Variable Mesh Gillnets

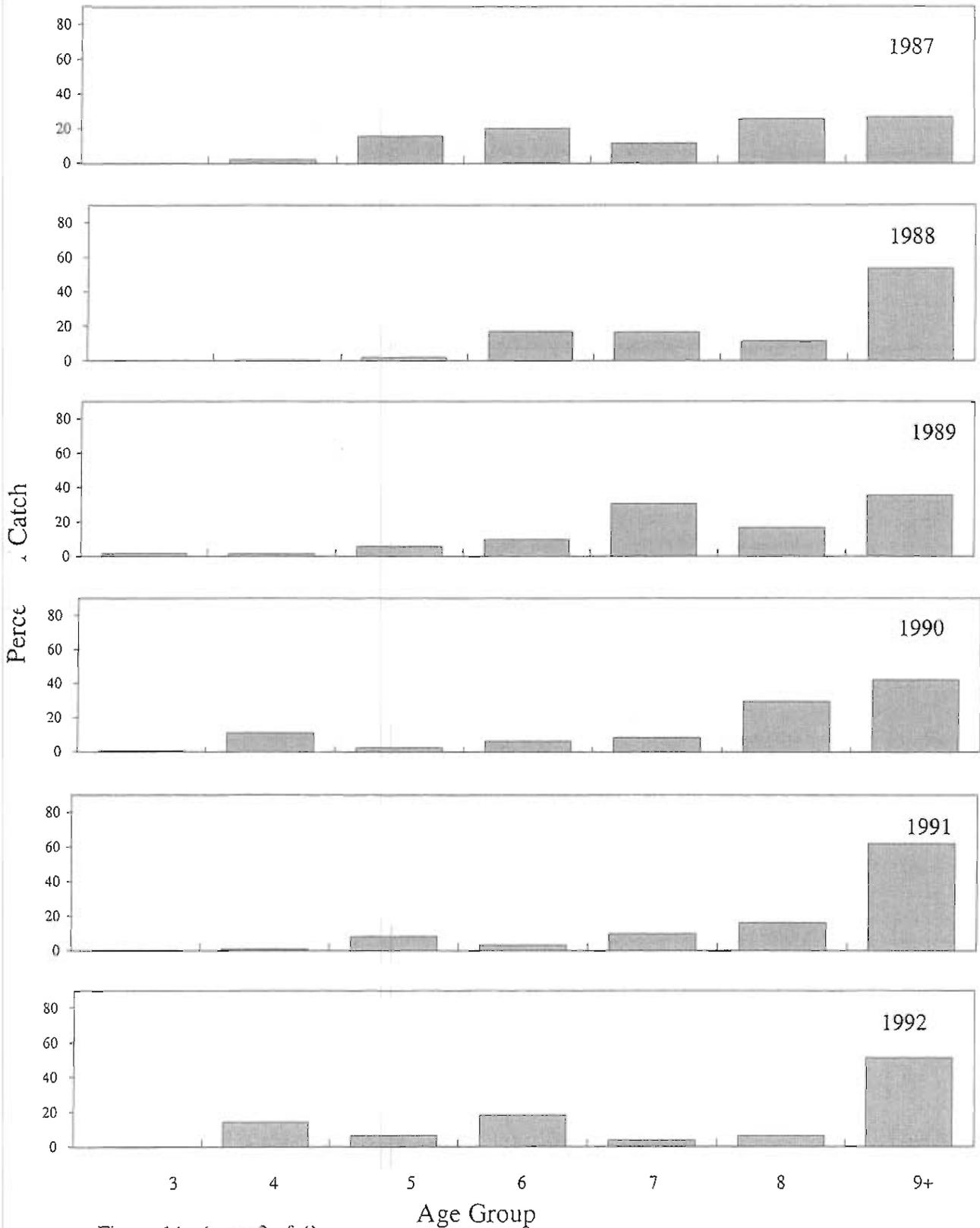


Figure 11. (page 2 of 4)

Norton Sound District
Age Composition of Variable Mesh Gillnets

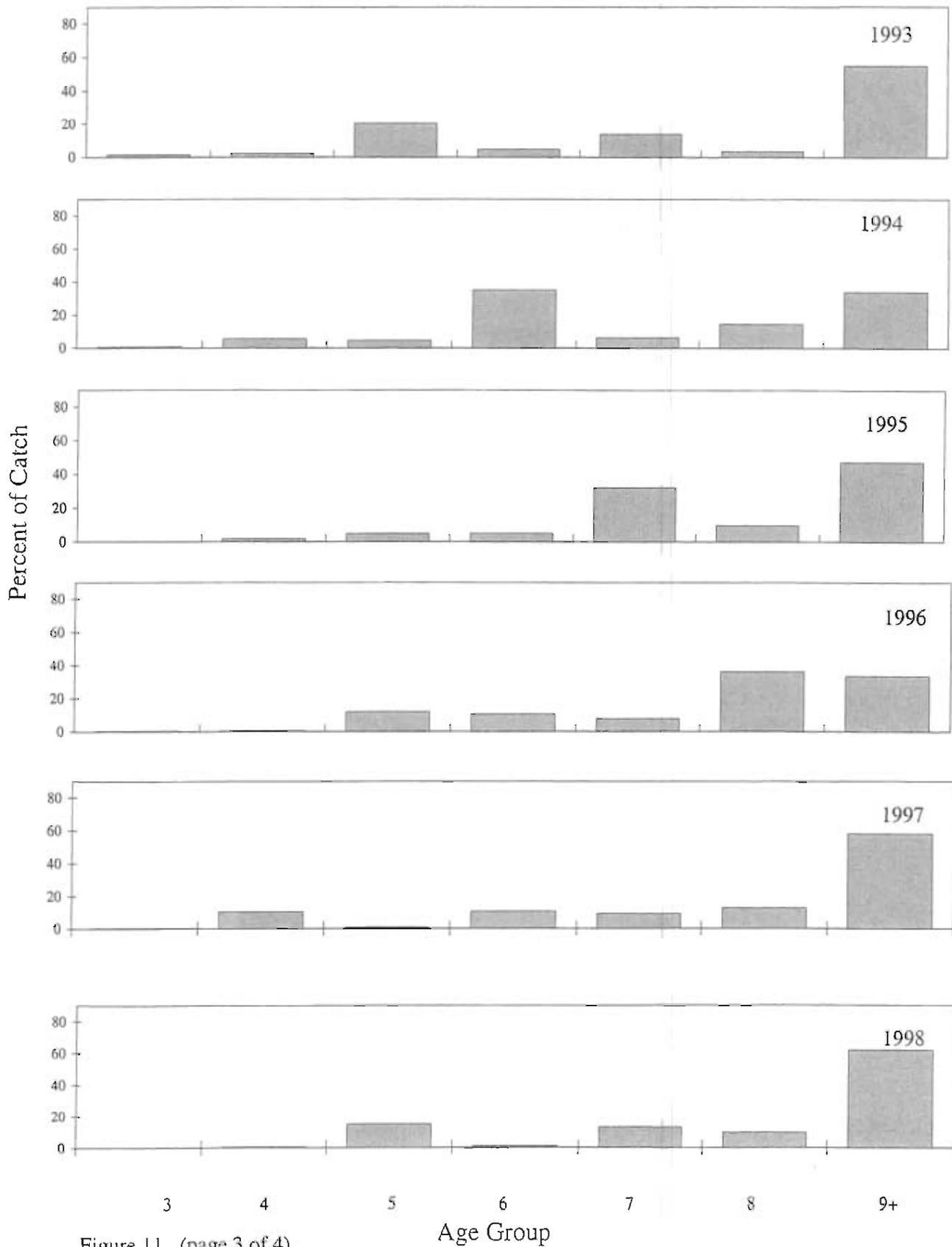


Figure 11. (page 3 of 4)

Norton Sound District
Age Composition of Variable Mesh Gillnets

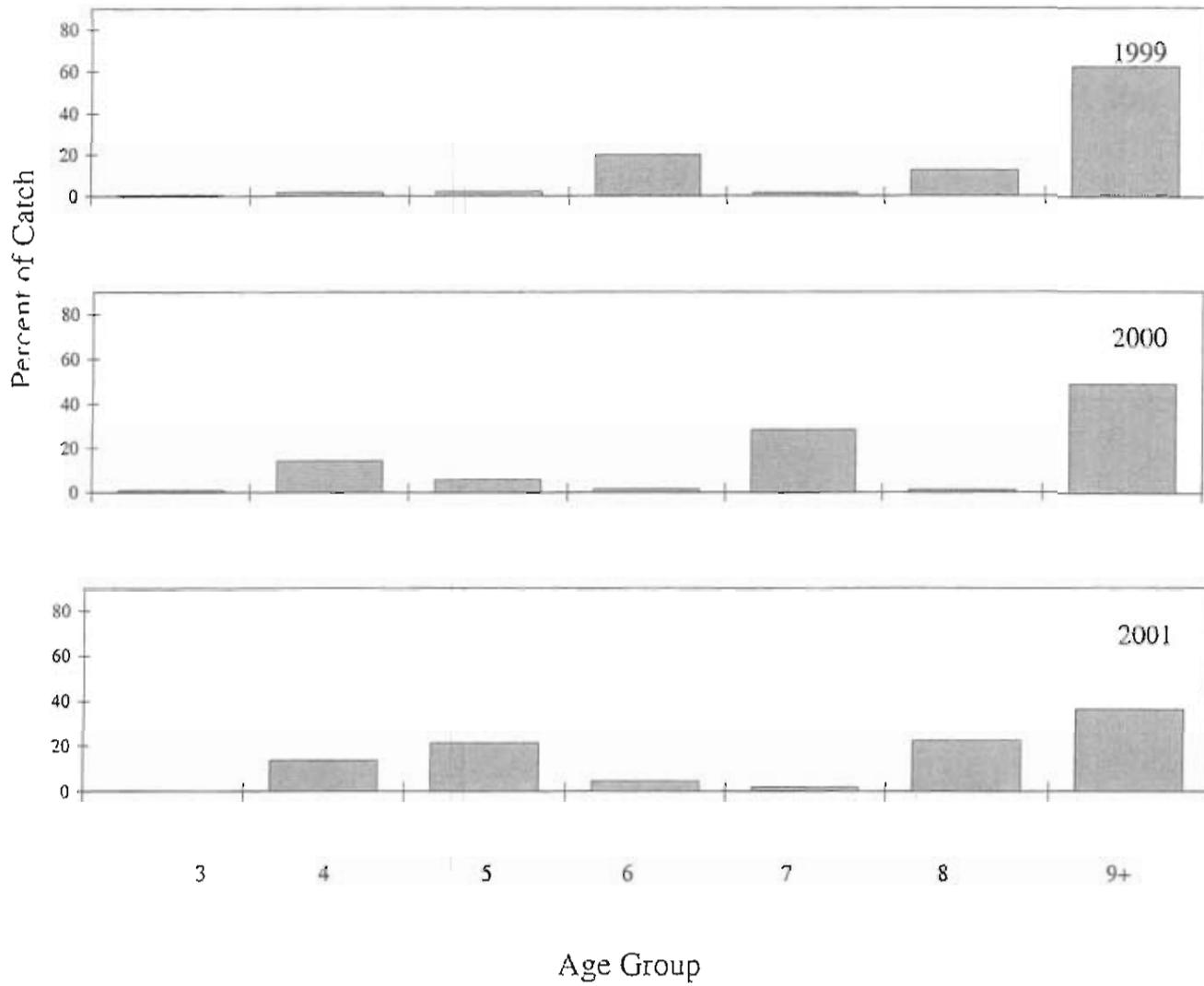


Figure 11. (page 4 of 4)

NORTON SOUND HERRING 2001 Catch and the 2002 Projection

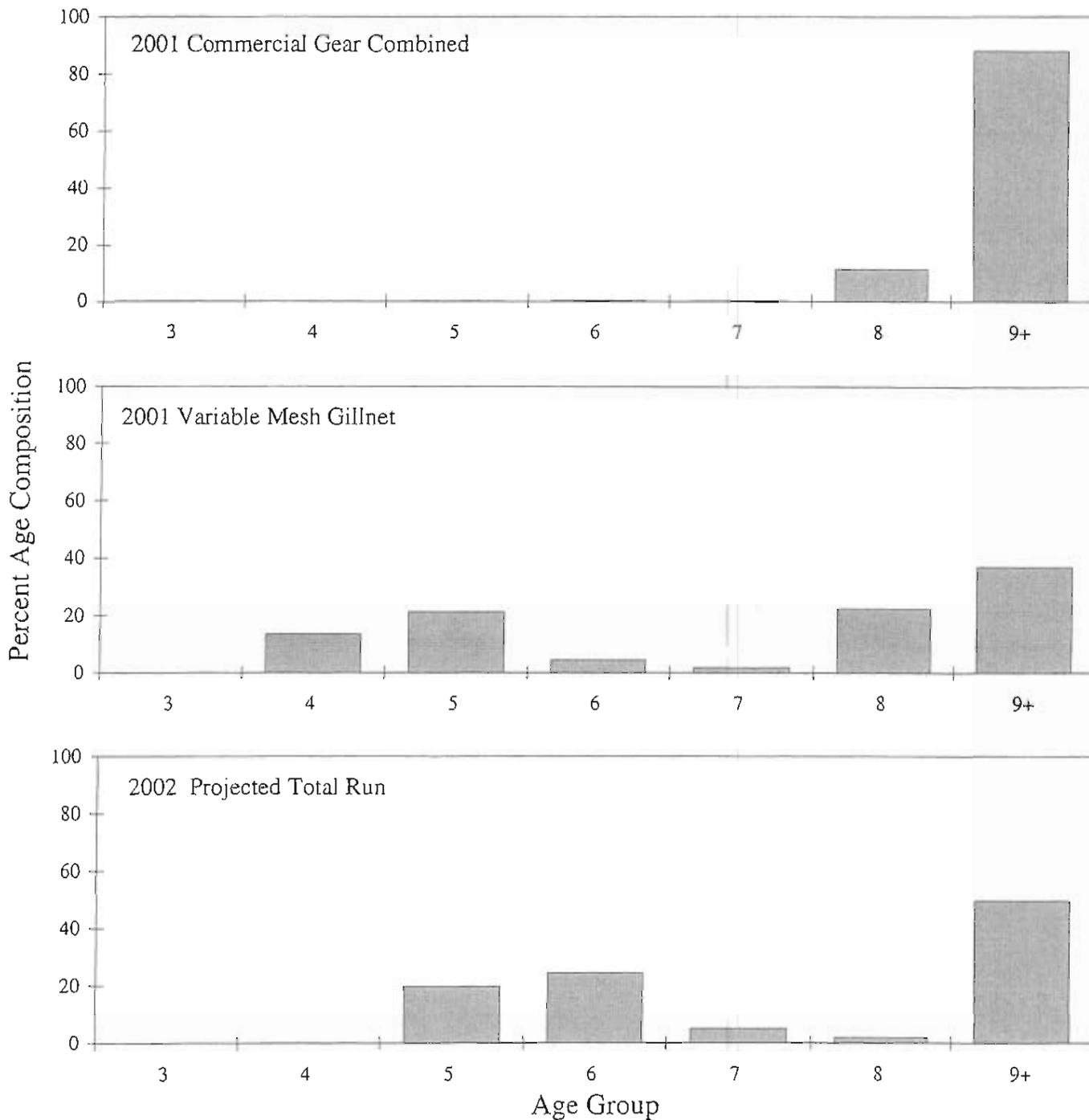


Figure 12. Norton Sound Pacific herring age composition comparison of the 2001 commercial gillnet gear, variable mesh gear, and the projected age composition of the 2002 return.

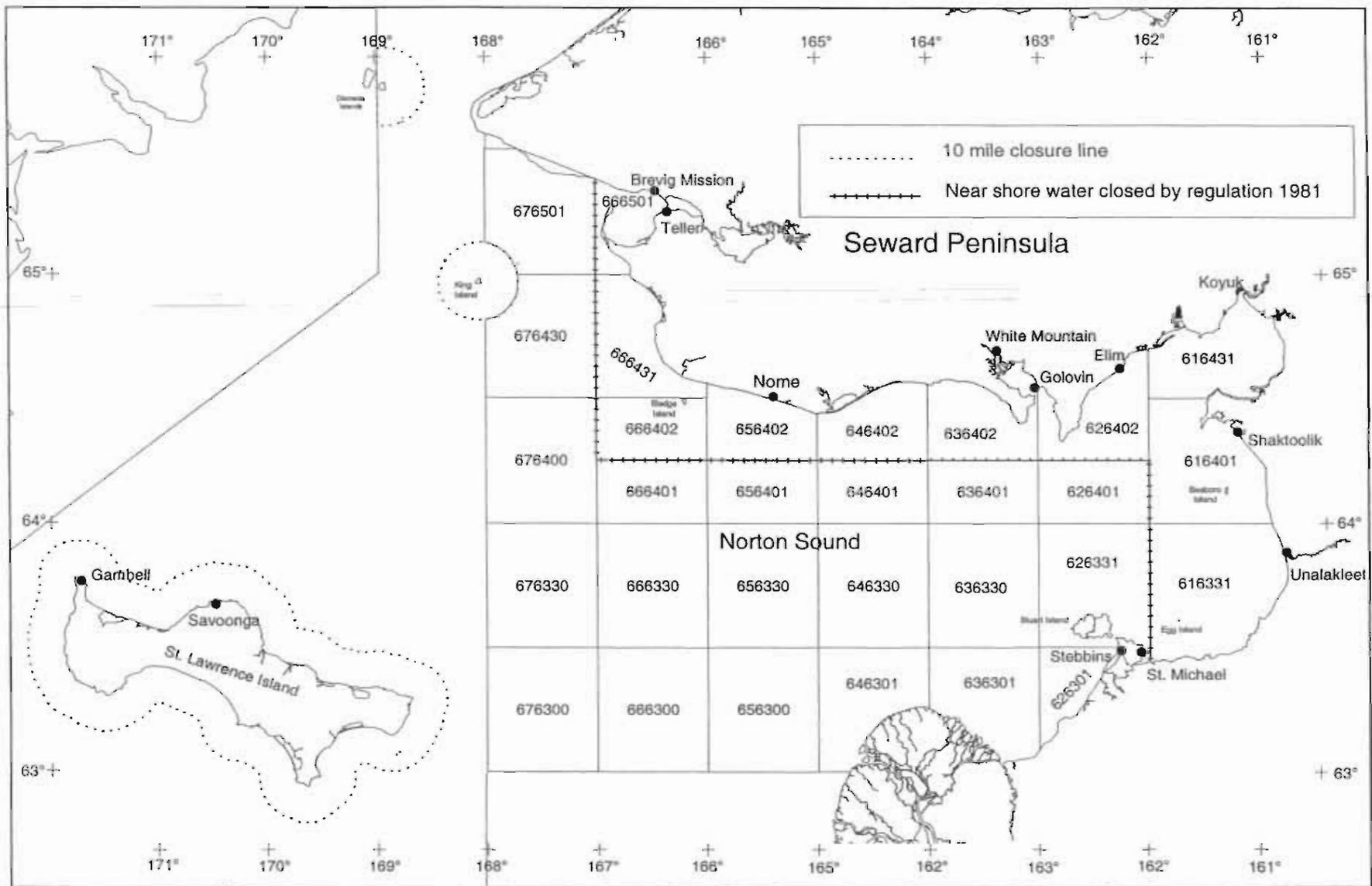


Figure 13. Statistical areas for the Norton Sound red king crab fishery.

Norton Sound Red King Crab

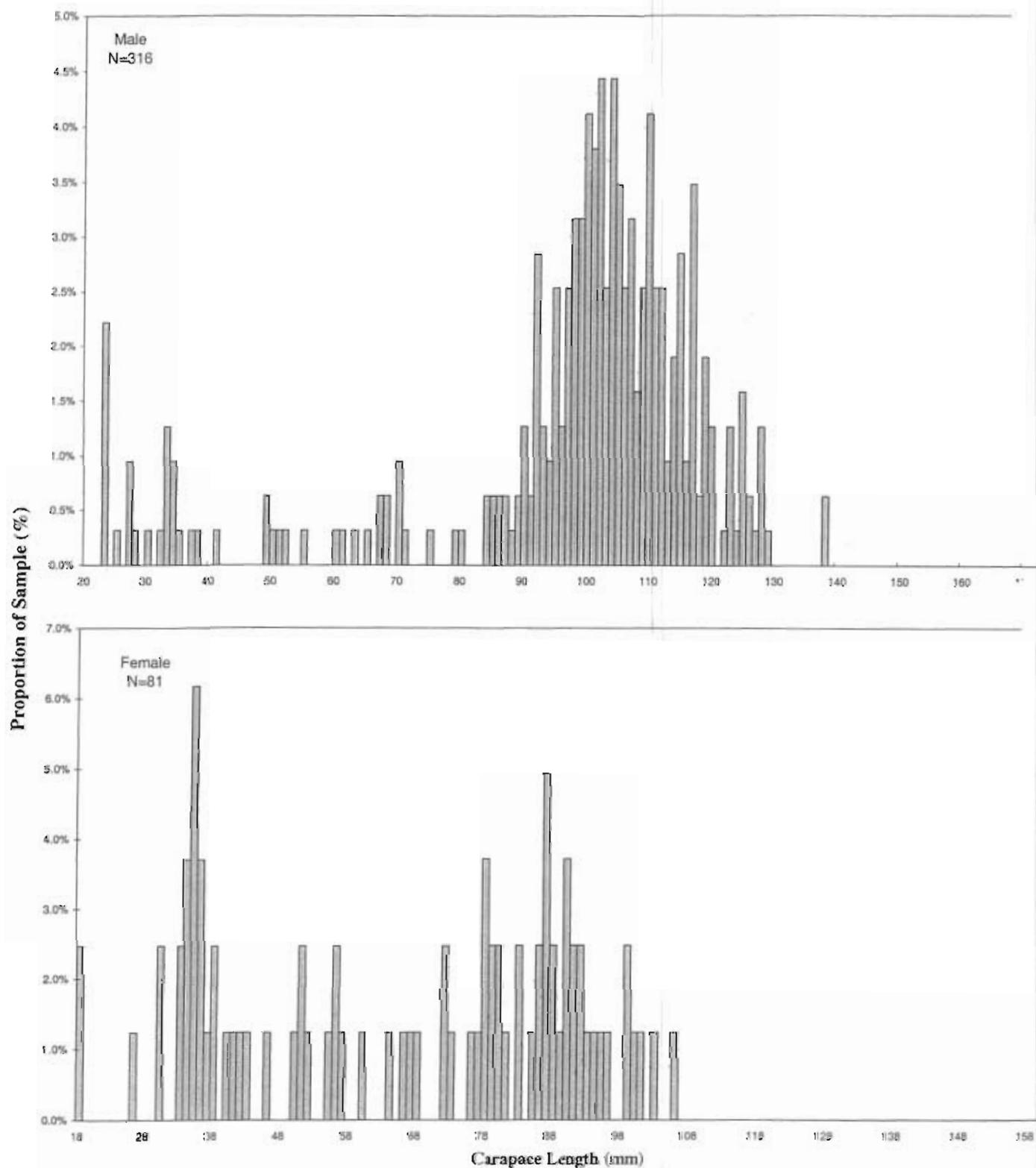


Figure 14. Norton Sound male and female red king crab size distribution from a trawl assessment survey conducted by ADF&G, 1999.

Norton Sound Red King Crab

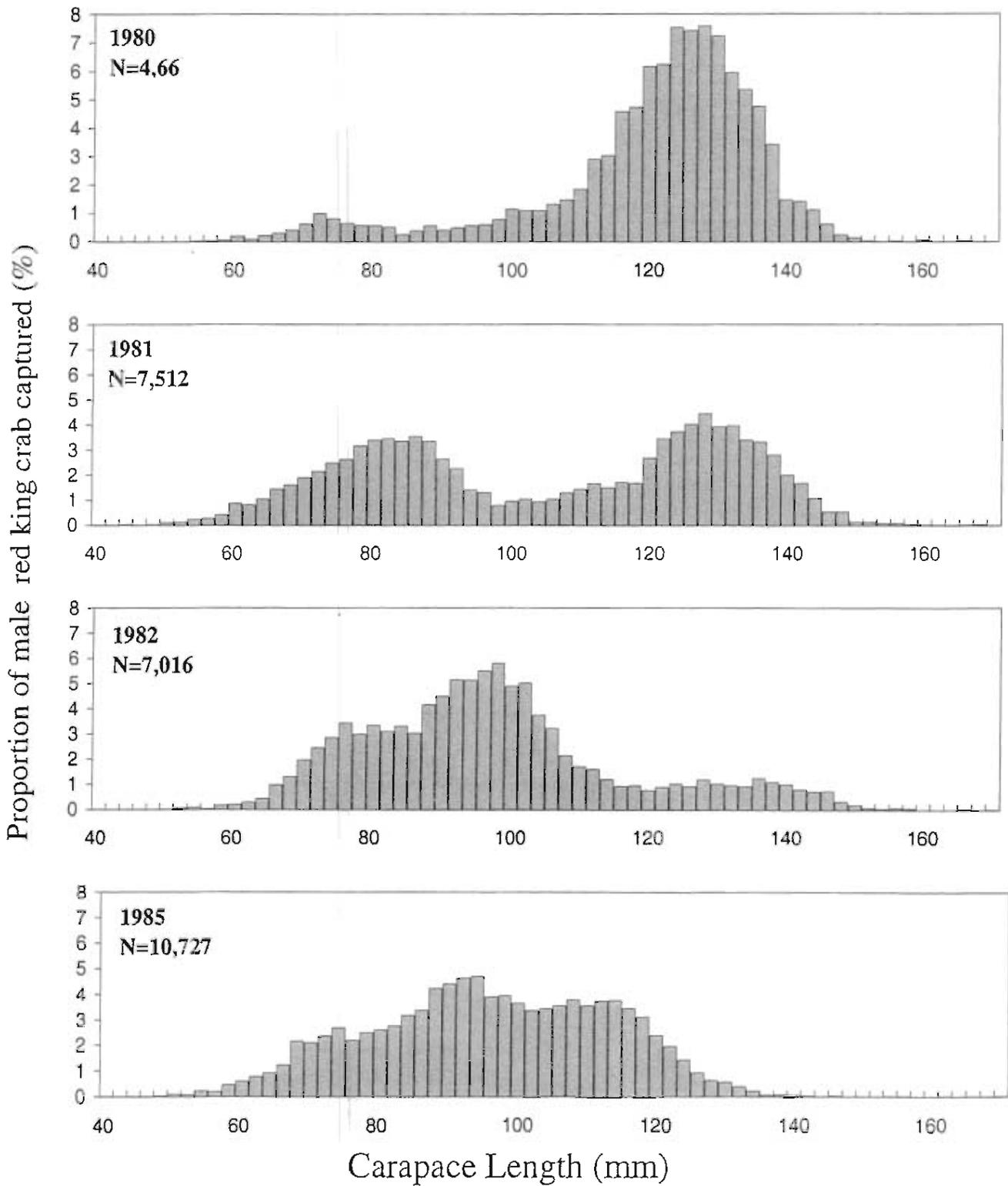


Figure 15. Norton Sound male red king crab size distribution from pot assessment surveys conducted by the Alaska Department of Fish and Game, 1980, 1981, 1982, and 1985.

Norton Sound Red King Crab

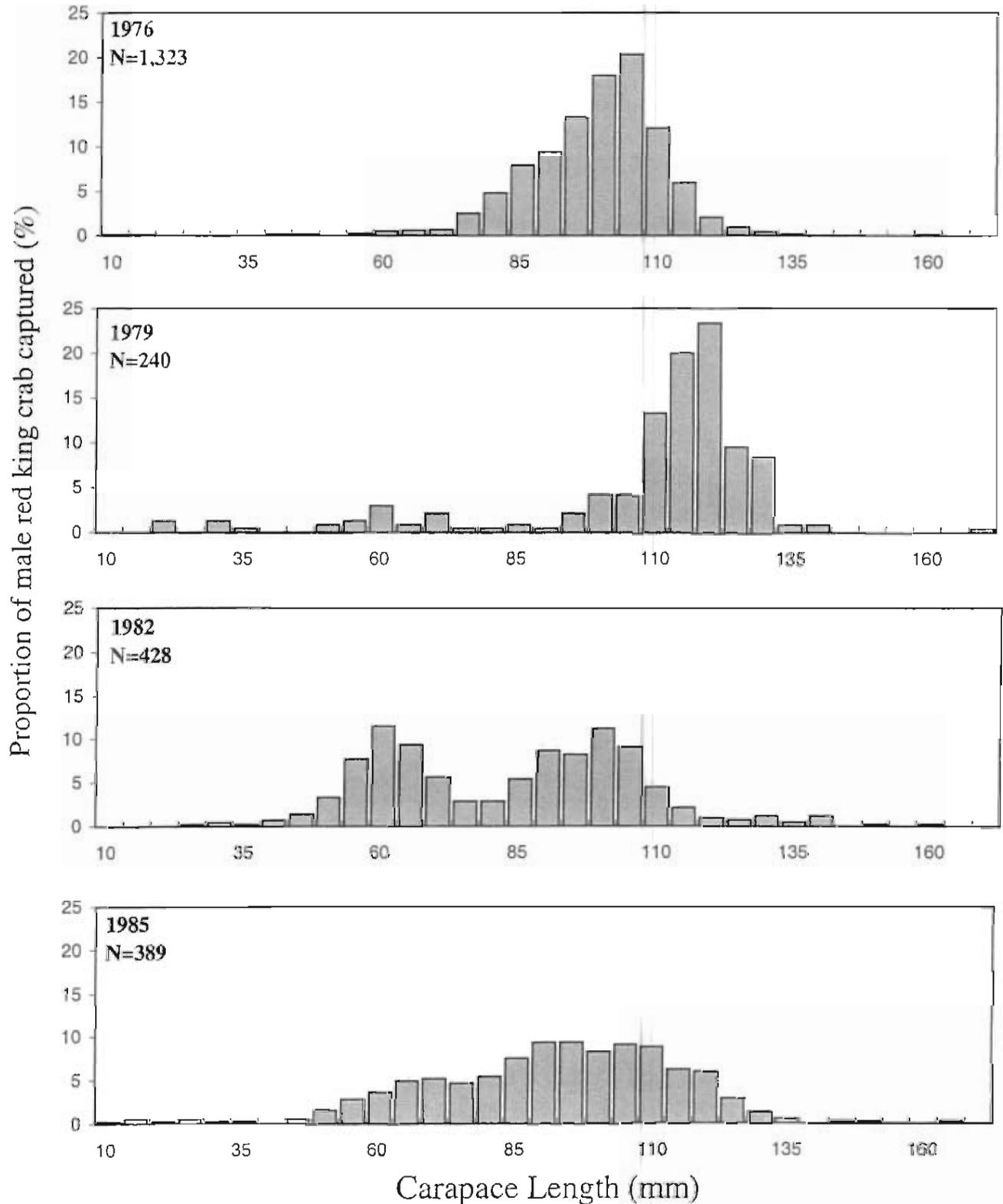


Figure 16. Norton Sound male red king crab size distribution from trawl assessment surveys conducted by the National Marine Fisheries Service, 1976, 1979, 1982, 1985, 1988, 1991, and by ADF&G in 1996, and 1999 (Page 1 of 2).

Norton Sound Red King Crab

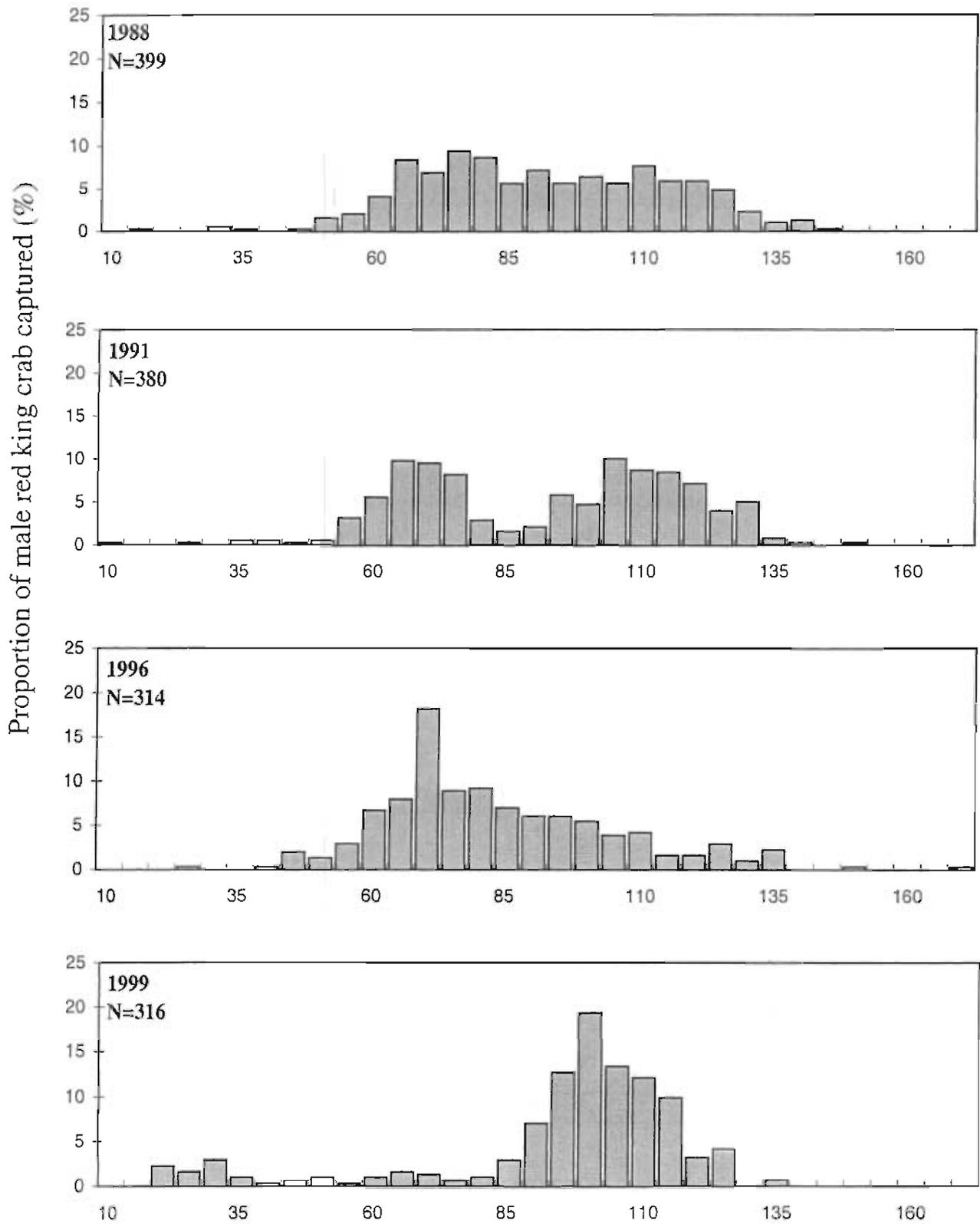


Figure 16. (Page 2 of 2)

Carapace Length (mm)

Norton Sound Red King Crab

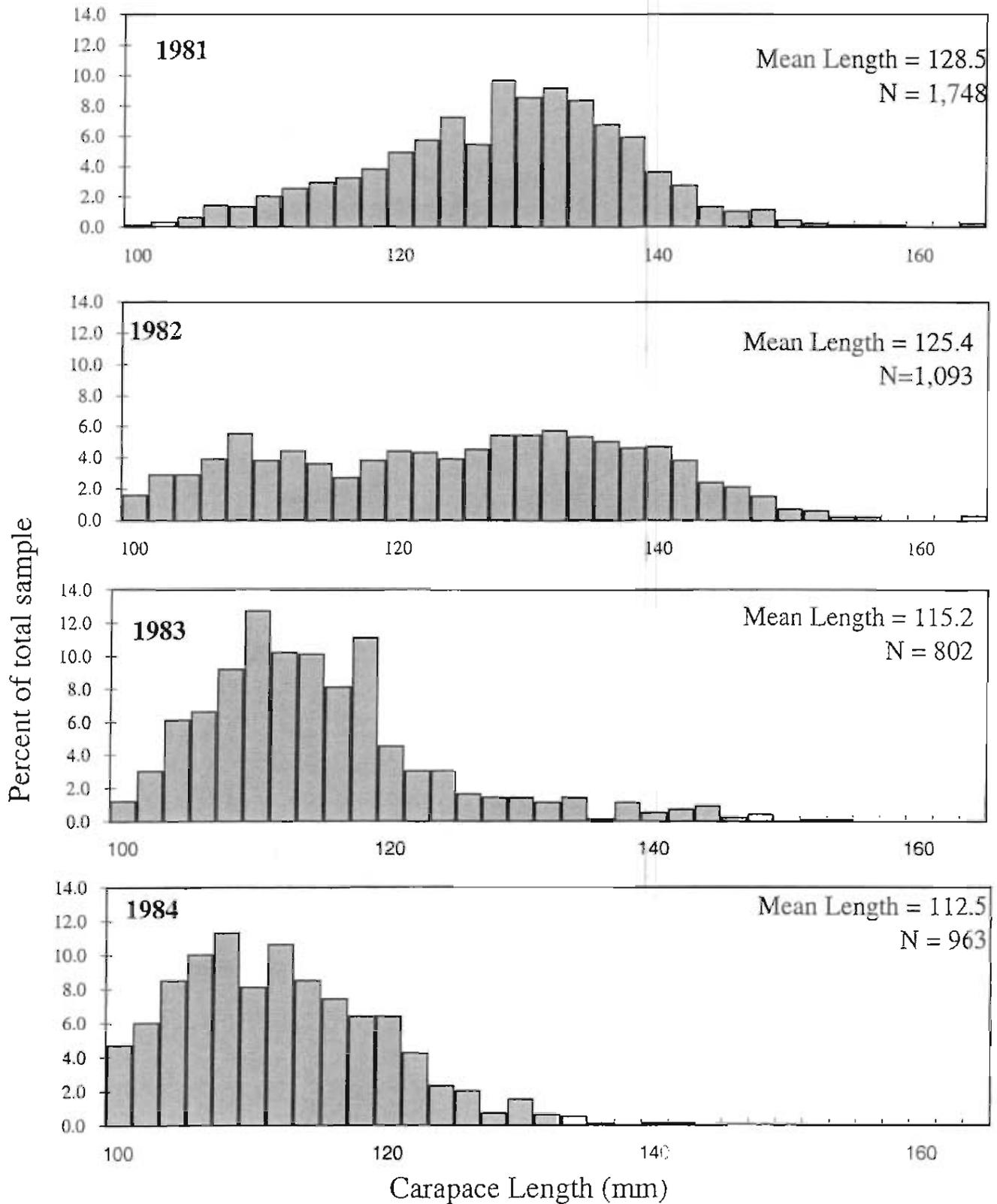


Figure 17. Length composition of Norton Sound red king crab summer commercial harvests, 1981-2001. (Page 1 of 5)

Norton Sound Red King Crab

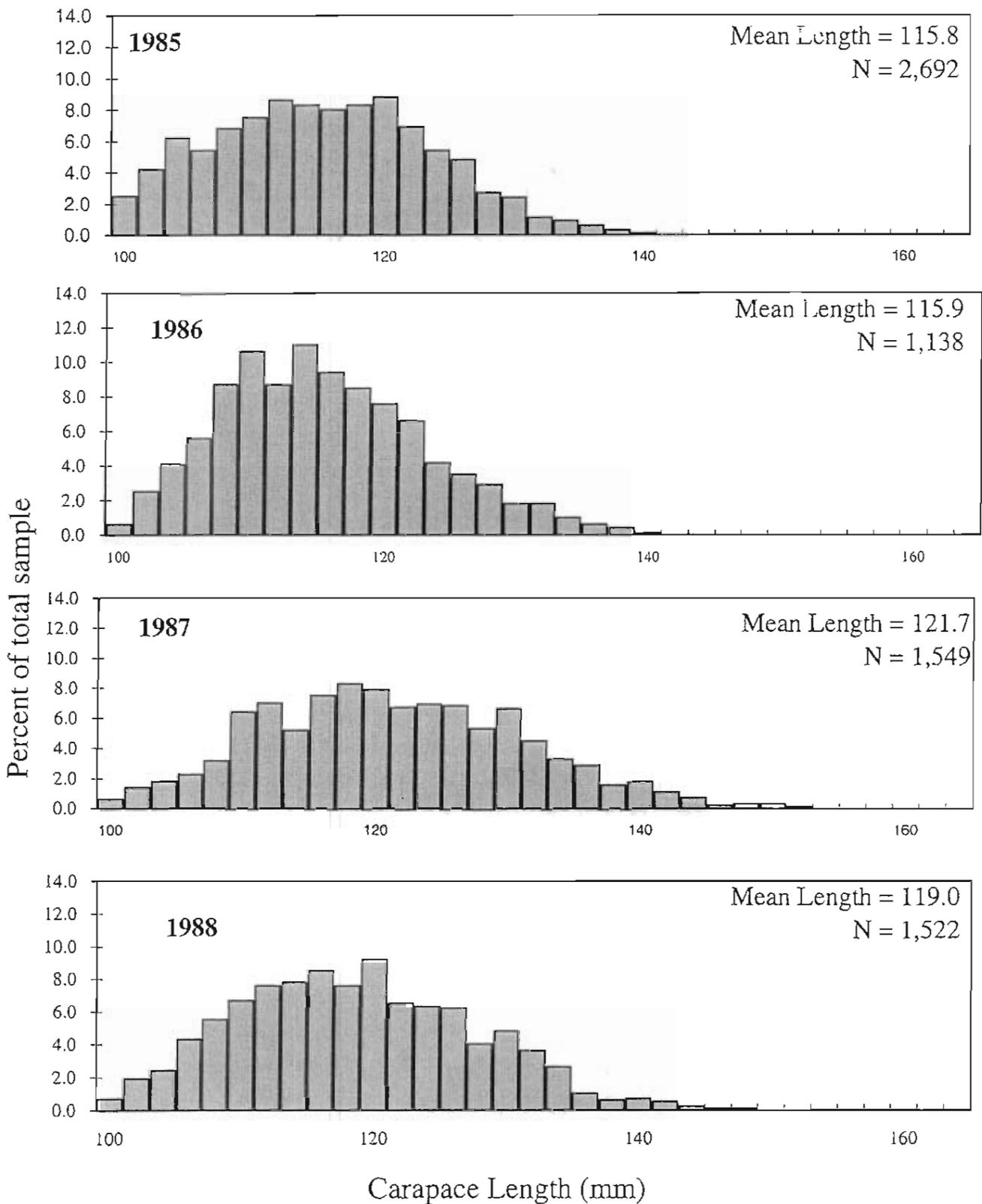


Figure 17. (page 2 of 5)

Norton Sound Red King Crab

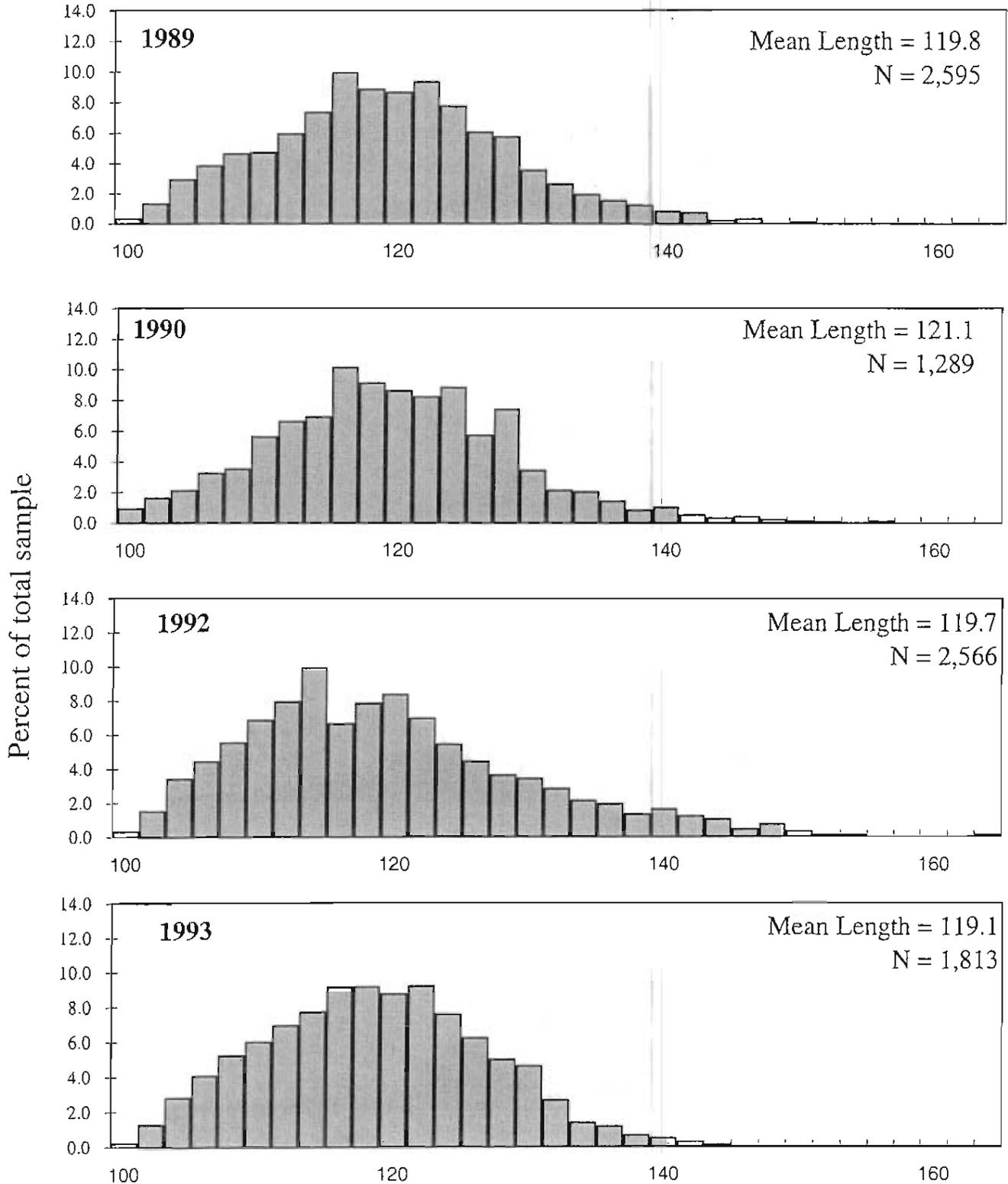


Figure 17. (page 3 of 5)

Note: There was no fishery in 1991.

Norton Sound Red King Crab

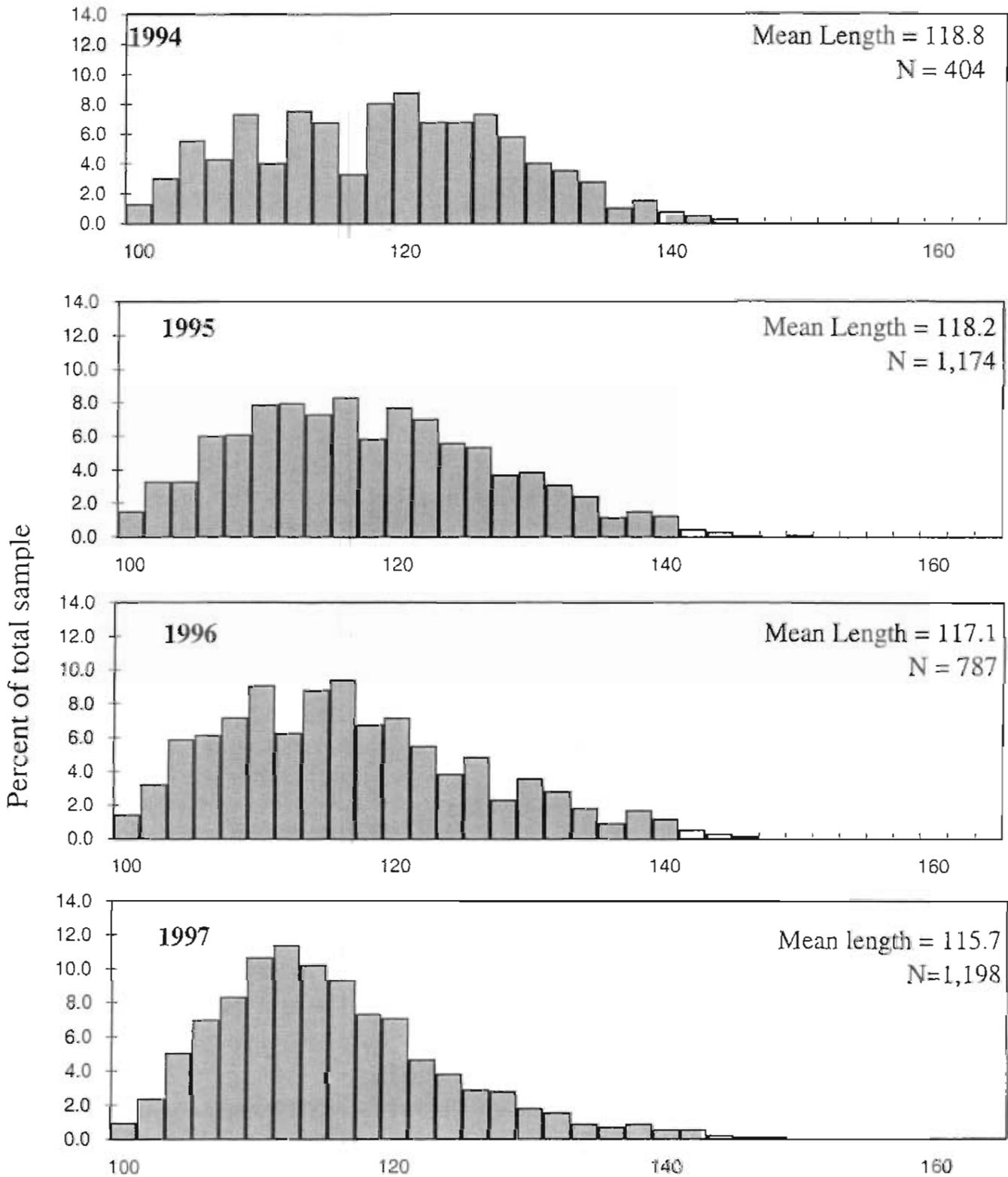


Figure 17. (page 4 of 5)

Norton Sound Red King Crab

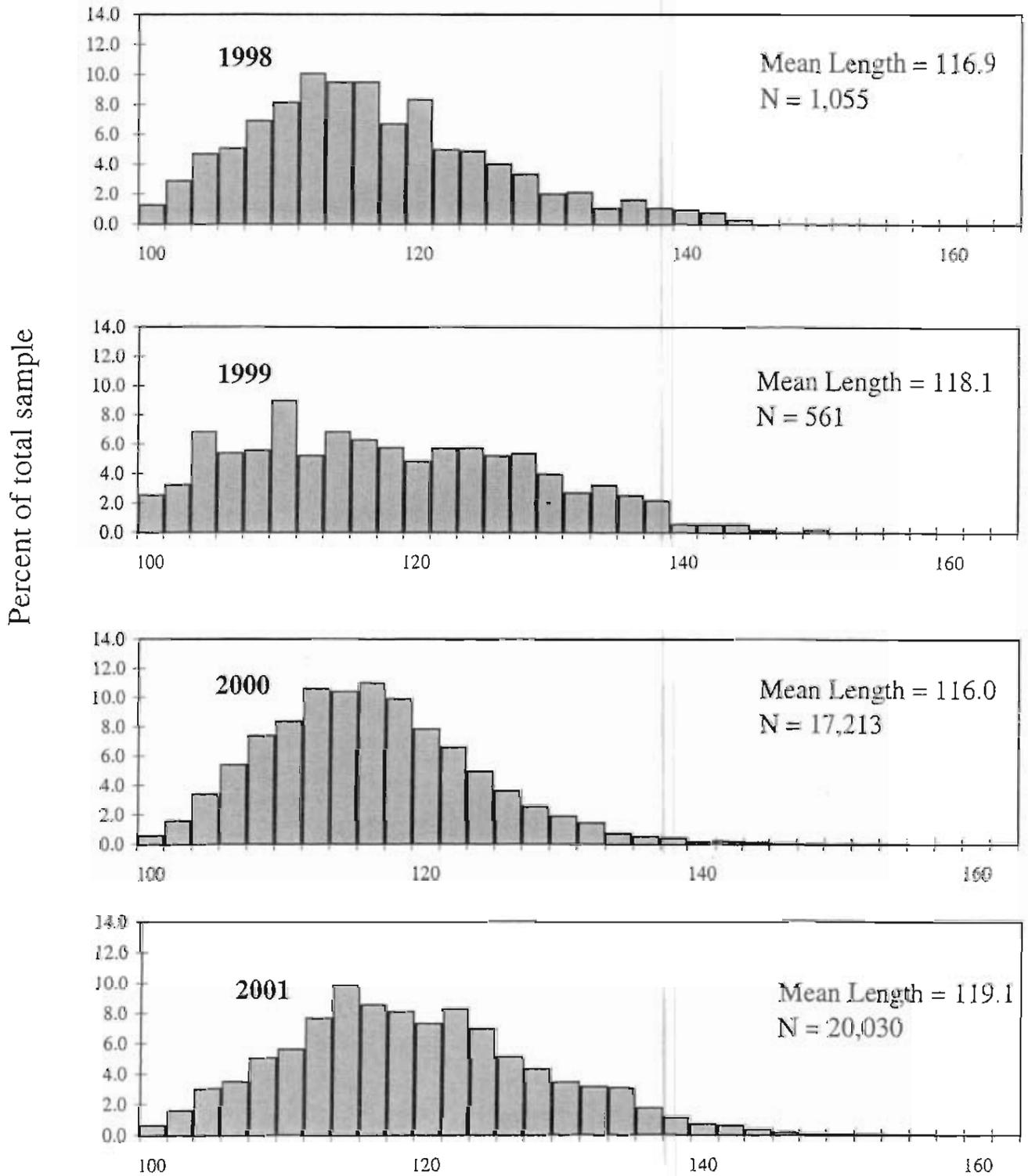


Figure 17. (page 5 of 5)

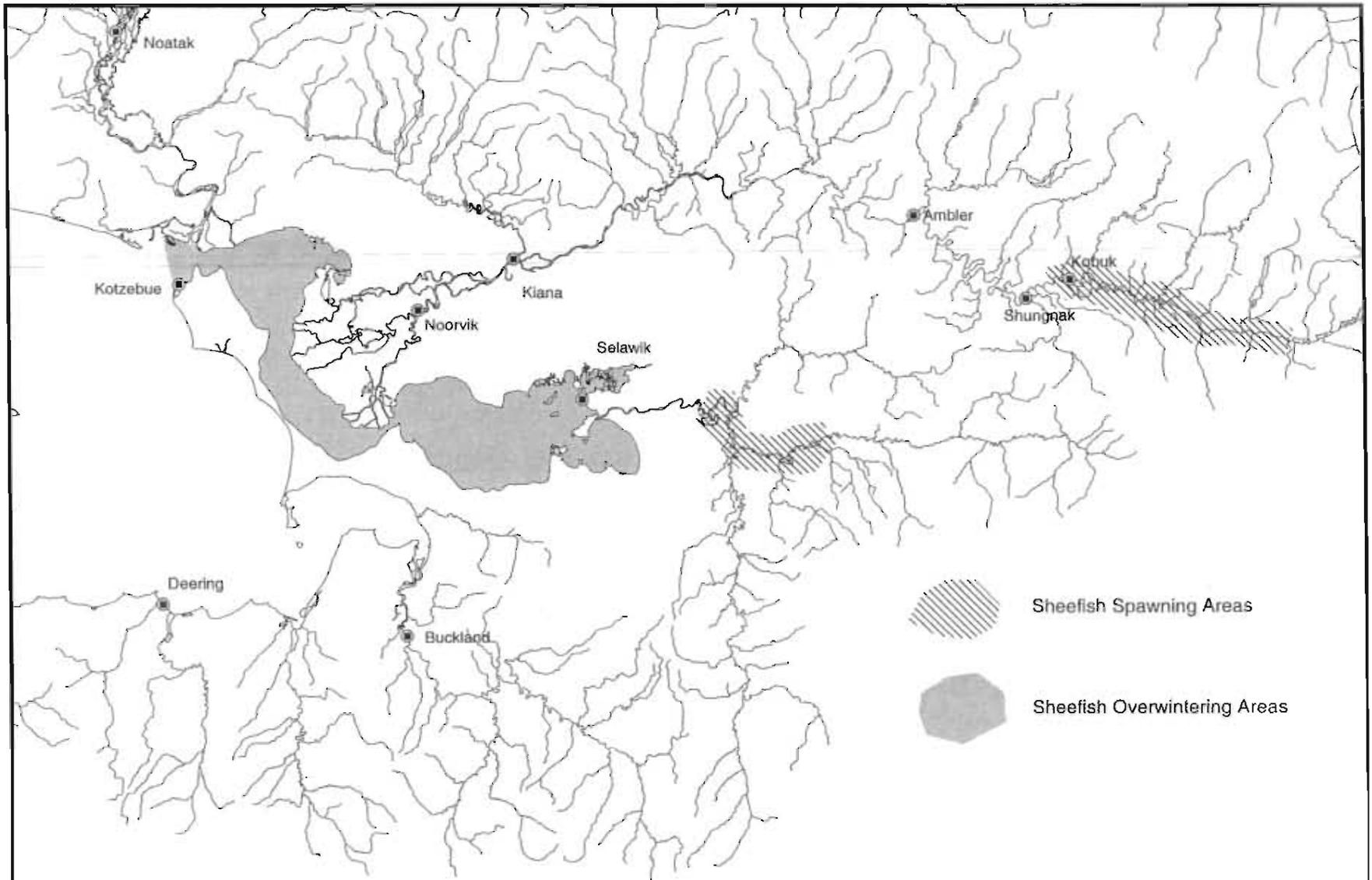


Figure 18. Kotzebue and Kobuk River Valley villages and their spatial relationship with inconnu spawning and overwintering areas.

Appendix Table A1. Number of commercial salmon permits fished, Norton Sound, 1970-2001.

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
2001	0	5	5	0	13	29	51

^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, 1964-2001.

NOME (SUBDISTRICT 1)																			
Year	Commercial						Subsistence ^a						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	8,066	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	

-Continued-

Appendix Table A2. Commercial and subsistence salmon catches by species, by year in Nome Subdistrict, Norton Sound District, 1964-2001.

NOME (SUBDISTRICT 1)																		
Year	Commercial						Subsistence ^a						Combined					
	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1986	6	-	50	-	8,160	8,216	150	107	888	8,720	8,085	17,750	156	107	738	8,720	16,245	25,966
1987	3	-	577	-	5,846	6,226	200	107	1,100	1,251	8,394	11,052	203	107	1,677	1,251	14,040	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
2001	0	0	0	0	0	0	2	92	425	113	858	1,490	2	92	425	113	858	1,490
5-year avg. ^b	0	0	2	3	1	5	14	115	763	2,720	2,233	5,846	14	115	765	2,723	2,234	5,851
10-year avg. ^c	0	1	197	20	120	338	42	127	1,153	2,906	2,535	6,762	42	127	1,350	2,926	2,655	7,100

^a Subsistence harvest are incomplete prior to 1979.^b 1996-2000^c 1991-2000

Appendix Table A3. Commercial and subsistence salmon catches by species, by year in Golovin Subdistrict, Norton Sound District, 1962-2001.

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	5,156	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	-	-	-	-	-	-	-	-	-	-	-	-
1984	31	-	2,462	88,588	54,153	145,234	-	-	-	-	-	-	-	-	-	-	-	-
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

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GOLOVIN (SUBDISTRICT 2)

Year	Commercial						Subsistence						Combined					
	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1986	81	8	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
2001	0	43	30	0	7094	7,167	89	72	880	1,665	3,291	5,997	89	115	910	1,665	10,385	13,164
5-year avg. ^a	4	0	478	24,838	1,778	27,098	127	133	1,686	9,337	2,892	14,176	131	133	2,164	34,175	4,670	41,273
10-year avg. ^b	8	2	952	13,697	2,963	17,620												

^a 1996-2000

^b 1991-2000

^c Subsistence survey not conducted.

^d Harvest estimated from Div. of Subsistence survey.

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Appendix Table A4. Commercial and subsistence salmon catches by species, by year in Moses Point Subdistrict, Norton Sound District, 1962-2001.

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	36,886	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	10,086	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 ^a	883	32	3,192	1,771	25,413	31,291

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MOSES POINT (SUBDISTRICT 3)

Year	Commercial						Subsistence						Combined					
	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1986	600	41	5,874	15,795	20,668	42,978	-	-	-	-	-	- ^c	-	-	-	-	-	-
1987	907	15	64	568	17,278	18,832	-	-	-	-	-	- ^c	-	-	-	-	-	-
1988	663	93	3,974	13,703	18,585	37,018	-	-	-	-	-	- ^c	-	-	-	-	-	-
1989	62	0	0	0	167	229	-	-	-	-	-	- ^c	-	-	-	-	-	-
1990	202	0	0	501	3,723	4,426	-	-	-	-	-	- ^c	-	-	-	-	-	-
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
2001	7	0	1,696	0	681	2,384	427	70	1,352	1,390	898	4,137 ^d	434	70	3,048	1,390	1,579	6,521
5-year avg. ^a	192	0	1,994	52,129	1,106	55,421	424	42	1,434	5,039	1,535	8,474	616	42	3,427	57,168	2,641	63,895
10-year avg. ^b	113	4	2,665	26,361	809	29,952	351	47	1,435	4,802	2,048	8,669	464	54	4,100	31,163	2,857	38,621

^a 1996-2000

^b 1991-2000

^c Subsistence survey not conducted.

^d Harvest estimated from Div. of Subsistence survey.

Appendix Table A5. Commercial and subsistence salmon catches by species, by year in Norton Bay Subdistrict, Norton Sound District, 1962-2001.

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	9,621	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	-	-	-	-	-	- ^c	-	-	-	-	-	-
1984	-	-	-	1,162	3,442	4,604	-	-	-	-	-	- ^c	-	-	-	-	-	-
1985	528	-	384	68	9,948	10,928	-	-	-	-	-	- ^c	-	-	-	-	-	-

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NORTON BAY (SUBDISTRICT 4)

Year	Commercial						Subsistence						Combined					
	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1986	139	2	1,512	40	1,994	3,687	-	-	-	-	-	- ^c	-	-	-	-	-	-
1987	544	-	145	16	3,586	4,291	-	-	-	-	-	- ^c	-	-	-	-	-	-
1988	434	2	709	1,749	7,521	10,415	-	-	-	-	-	- ^c	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-	-	-	- ^c	-	-	-	-	-	-
1990 ^d	0	0	0	0	0	0	-	-	-	-	-	- ^c	-	-	-	-	-	-
1991 ^d	0	0	0	0	0	0	-	-	-	-	-	- ^c	-	-	-	-	-	-
1992	27	0	0	0	1,787	1,814	-	-	-	-	-	- ^c	-	-	-	-	-	-
1993	267	0	0	290	1,378	1,935	-	-	-	-	-	- ^c	-	-	-	-	-	-
1994 ^d	0	0	0	0	0	0	308	1	370	6,049	4,581	11,309 ^e	308	1	370	6,049	4,581	11,309
1995 ^d	0	0	0	0	0	0	475	46	985	3,514	5,828	10,848 ^e	475	46	985	3,514	5,828	10,848
1996 ^d	0	0	0	0	0	0	295	3	676	3,929	4,161	9,064 ^e	295	3	676	3,929	4,161	9,064
1997	194	0	0	0	531	725	656	54	322	1,795	4,040	6,777 ^e	850	54	322	1,795	4,571	7,502
1998 ^d	0	0	0	0	0	0	684	0	388	2,009	6,192	9,274 ^e	684	0	388	2,009	6,192	9,274
1999 ^d	0	0	0	0	0	0	327	0	167	1,943	4,153	6,590 ^e	327	0	167	1,943	4,153	6,590
2000 ^d	0	0	0	0	0	0	397	2	267	2,255	4,714	7,635 ^e	397	2	267	2,255	4,714	7,635
2001 ^d	0	0	0	0	0	0	460	14	276	5,203	4,445	10,397 ^e	460	14	276	5,203	4,445	10,397
5-year avg. ^a	39	0	0	0	106	145	472	12	364	2,386	4,652	7,868	511	12	364	2,386	4,758	8,013
10-year avg. ^b	49	0	0	29	370	447	-	-	-	-	-	-	-	-	-	-	-	-

^a 1996-2000

^b 1991-2000

^c Subsistence survey not conducted.

^d No commercial harvest reported.

^e Harvest estimated from Div. of Subsistence survey.

Appendix Table A6. Commercial and subsistence salmon catches by species, by year in Shaktoolik Subdistrict, Norton Sound District, 1961-2001.

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	876	-	532	7,551	26,749	35,508
1975	651	2	812	1,774	49,536	52,775	18	-	14	1,994	334	1,760	669	2	826	3,168	49,870	54,535
1976	892	-	129	15,803	15,798	32,522	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

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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
1966	1,075	29	6,626	-	16,126	23,856	-	-	-	-	-	-	°	-	-	-	-	-
1967	2,214	-	6,193	-	14,088	22,495	-	-	-	-	-	-	°	-	-	-	-	-
1968	671	79	6,096	3,681	21,521	32,048	-	-	-	-	-	-	°	-	-	-	-	-
1969	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	319,352	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	2,395	0	2,181	5,160	818	183	1,555	5,092	467	8,116 ^d	1,399	183	3,954	5,092	2,648	13,276
2000	160	3	7,779	85,493	2,751	96,186	440	20	2,799	5,432	2,412	11,103 ^d	600	23	10,578	90,925	5,163	107,289
2001	90	0	2,664	0	1,819	4,573	936	143	2,090	10,172	1,553	14,895 ^d	1,026	143	4,754	10,172	3,372	19,468
5-year avg. ^a	1,088	1	6,388	125,329	4,199	137,005	900	78	2,521	6,189	1,990	11,677	1,988	78	8,908	131,518	6,189	148,682
10-year avg. ^b	1,274	15	10,226	127,300	12,153	150,968	-	-	-	-	-	-	-	-	-	-	-	-

^a 1996-2000^b 1991-2000^c Subsistence survey not conducted.^d Harvest estimated from Div. of Subsistence survey.

UNALAKLEET (SUBDISTRICT 8)

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	3,367	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	3,428	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	1,720	-	9,135	19,568	29,142	59,565
1974	2,100	-	1,778	93,332	36,170	133,380	313	-	706	7,341	588	8,948	2,413	-	2,484	100,673	36,758	142,328
1975	1,638	-	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	196,200	37,079	186,546	1,044	-	2,536	13,268	3,442	20,292	8,569	5	8,275	149,468	40,521	208,836
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	16,666	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	4,661	4	68,380	182,901	49,214	285,180
1983	7,022	13	36,098	26,198	109,220	178,551	1,668	33	6,888	13,808	4,401	26,998	8,690	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

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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
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	- ^e	-	-	-	-	-	-
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	57,100	51,730	25,020	634,434
1995	7,617	78	31,260	37,009	24,843	100,827	5,049	807	13,110	17,246	13,460	49,672 ^f	12,666	885	44,390	54,255	38,303	150,499
1996	3,644	-	52,200	113,837	7,369	177,050	5,324	608	15,963	19,782	16,481	58,157 ^f	8,968	608	68,163	133,619	23,850	235,207
1997	9,067	159	26,079	-	17,139	52,444	8,325	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	31,637	112,585	8,761	163,767
1999	1,927	0	10,264	0	5,700	17,891	2,691	537	6,140	10,067	3,692	25,127 ^f	4,618	537	18,404	10,067	9,392	43,018
2000	582	11	29,803	17,278	2,700	50,374	2,429	212	5,878	10,631	3,000	22,150 ^f	3,011	223	35,681	27,909	5,700	72,524
2001	116	1	15,102	0	1,512	16,731	3,562	376	9,520	11,710	9,165	34,434 ^f	3,778	377	24,622	11,710	10,677	51,165
5-year avg. ^a	4,327	35	28,576	46,105	7,824	86,867	4,146	382	9,281	12,891	6,675	33,375	8,473	418	37,857	58,997	14,498	120,242
10-year avg. ^b	4,754	95	40,795	79,604	19,656	144,904	-	-	-	-	-	-	-	-	-	-	-	-

^a 1996-2000^b 1991-2000^c Subsistence catches from 1966-72 includes fish taken at St. Michael.^d Subsistence surveys not conducted.^e In-depth survey by Subsistence Division.^f Harvest estimate from Div. of Subsistence survey. Includes harvest in Stebbins and St. Michael.

Appendix Table A8. Commercial and subsistence salmon catches by species, by year for all subdistricts in Norton Sound District, 1961-2001.

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	2,665	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	36,687	1,822	14	7,965	27,113	102,118	139,032
1967	1,804	-	2,379	28,879	41,756	74,818	817	-	1,222	17,516	22,724	42,279	2,621	-	3,601	46,395	64,480	117,097
1968	1,045	-	6,885	71,179	45,300	124,409	237	-	2,391	36,912	11,661	51,201	1,282	-	9,276	108,081	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	7,224	15,758	162,960	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	160,741
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	2,993	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	220,698	276,166
1976	2,243	11	6,934	87,919	96,956	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	12,267	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	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	6,903	18	105,302	264,530	201,915	599,668
1983	10,308	27	49,735	76,913	319,437	456,420	-	-	-	-	-	-	-	-	-	-	-	-
1984	8,455	6	67,875	119,381	146,442	342,159	-	-	-	-	-	-	-	-	-	-	-	-

-Continued-

Appendix Table A8. Commercial and subsistence salmon catches by species, by year for all subdistricts in Norton Sound District, 1961-2001.

ALL SUBDISTRICTS																			
Year	Commercial						Subsistence						Combined						
	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	
1965	19,491	166	21,968	3,647	134,928	180,200	-	-	-	-	-	- ^d	-	-	-	-	-	-	-
1966	6,395	233	35,600	41,260	146,912	230,400	-	-	-	-	-	- ^e	-	-	-	-	-	-	-
1967	7,080	207	24,279	2,260	102,457	136,283	-	-	-	-	-	- ^d	-	-	-	-	-	-	-
1968	4,096	1,252	37,214	74,604	107,966	225,132	-	-	-	-	-	- ^d	-	-	-	-	-	-	-
1969	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	-	-	-	-	-	- ^f	-	-	-	-	-	-	-
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	-	-	-	-	-	- ^f	-	-	-	-	-	-	-
1994 ^{a,b}	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,b}	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	1,360	70,877	120,238	85,912	295,003	
1996 ^{a,b}	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,b}	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,b}	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,b}	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,b}	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	
2001 ^{a,b}	213	44	19,492	0	11,100	30,849	5,576	767	14,543	30,253	20,210	71,349	5,789	811	34,035	30,253	31,310	102,198	
5-year avg. ^a	5,649	37	37,437	248,404	15,013	306,540	6,968	1,229	18,638	40,436	23,620	90,893	12,617	1,266	56,075	288,841	38,634	397,433	
10-year avg. ^a	6,197	117	54,953	246,991	36,008	344,267	-	-	-	-	-	-	-	-	-	-	-	-	

^a 1996-2000^b 1991-2000^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, 1964-2001.

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
2001	17.8	7.8	-	7.2

^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 - 2001.

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	\$0.23
1991	^b \$0.87	\$0.36	-	\$0.27
1992	^c \$0.66	\$0.33	\$0.16	\$0.22
1993	^d \$0.72	\$0.22	\$0.15	\$0.24
1994	\$1.02	\$0.52	\$0.15	\$0.29
1995	\$0.66	\$0.43	\$0.18	\$0.18
1996	\$0.54	\$0.28	\$0.10	\$0.08
1997	\$1.00	\$0.47	\$0.06	\$0.11
1998	\$0.74	\$0.29	\$0.14	\$0.09
1999	\$0.82	\$0.35	-	\$0.11
2000	\$1.30	\$0.30	\$0.10	\$0.15
2001	^e \$1.00	\$0.25	-	\$0.19
5 yr. Avg. 1996-2000	\$0.88	\$0.34		\$0.11

^a Price paid per pound of roe.

^b Price paid for coho and chum roe was \$3.00 per pound.

^c Price paid for coho roe was \$1.50 per pound.

^d Price paid for coho roe was \$1.76 per pound and \$0.40 per pound for sockeye.

^e Price paid sockeye was \$0.37 per pound.

Appendix Table A11. Dollar estimates of Norton Sound District commercial salmon fishery, 1961 - 2001.

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	\$546,010.00	^a	\$11,386.00
1978	\$907,330.00	^a	\$12,002.00
1979	\$878,792.00	^a	\$11,780.00
1980	\$572,125.00	^a	\$11,640.00 ^c
1981	\$761,658.00	^a	\$11,940.00
1982	\$1,069,723.00	^a	\$7,155.00 ^{c d}
1983	\$946,232.00	^a	\$10,700.00 ^c
1984	\$738,064.00	^a	\$9,690.00 ^c
1985	\$818,477.00	^a	\$5,820.00 ^e
1986	\$546,452.00	^a	\$5,970.00 ^e
1987	\$517,894.00	^a	\$5,940.00 ^{e g}
1988	\$760,641.00	^a	\$10,050.00 ^{e f}
1989	\$319,489.00	^a	\$10,300.00 ^e
1990	\$474,064.00	^a	\$10,350.00 ^e
1991	\$413,479.00	^a	\$10,250.00 ^e
1992	\$463,616.00	^a	\$10,200.00 ^e
1993	\$368,723.00	^a	\$8,835.00 ^e
1994	\$863,060.00	^a	\$10,000.00 ^e
1995	\$356,164.00	^a	\$5,250.00 ^e
1996	\$292,264.00	^a	\$4,300.00 ^e
1997	\$326,618.00	^a	\$5,100.00 ^e
1998	\$351,410.00	^a	\$4,100.00 ^e
1999	\$82,638.00	^a	\$3,000.00 ^a
2000	\$143,621.00	^a	\$3,950.00 ^e
2001	\$56,921.00	^a	\$3,060.00 ^a

^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.

5-yr ave \$239,310.20

10-yr ave \$366,159.30

Appendix Table A12. Round weight of commercially caught salmon by species, Norton Sound District, 1961 - 2001.

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
2001	3,803	152,293	0	79,558	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, 1961-2001.

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
2001	213	44	19,492	0	11,100	30,849
Previous 5-Yr Avg ^a	5,649	37	37,437		15,013	306,540
Previous 10-Yr Avg ^b	6,197	117	54,953	47,848	36,008	344,267

^a 1996-2000^b 1991-2000; odd years only for pink salmon

Appendix Table A14. Comparative salmon escapement indexes of Norton Sound streams, 1961-2001.

(Page 1 of 4)

Year ^a	Simok 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												375	1,994		
1977	-	5,207	1,302			5	3,046	1,726				1,275	10		
1978	-	8,756	22,435			2	5,242	34,900				7,110			
1979												283	291		
1980	3	2,022	199,000		1,002	5			179,095	920				29,190	
1981	-	5,579	350			15	1,195	12,565			1	12,031	2,710		
1982	-	638	148,800				700	327,570			1	5,097	25,001		
1983	48	2,150	10,770		96	2	198	9,170		365	2	1,195	200		
1984	7 ^k	493 ^h	284,400 ^k		192		2,084 ^h	178,870		839	1	3,150 ^g	20,200 ^g		
1985	4	1,910	8,860		33	7	1,967	2,250		242	1	3,215	260		
1986	4	1,960	28,690			2	1,150	13,580			2	3,075	300		
1987	5	4,540	30		230	3	1,646	1,400 ^k		419	0	115	0		
1988	3	2,070	4,652 ^l		563	3	973	2,490 ^l		1,280 ^k	3	765	10		
1989	-	1,025	26,850		75	2	72	1,365		375					
1990	-	95	29,040		161		541	13,085		617					
1991	3	5,420	14,680		701	9	3,520	4,690		611	2	1,564	570		
1992	-	470	292,400		422	3	813	255,700		691		606	180		
1993	7	1,570	5,120		104	8	1,520	8,941		276 ^d		1,590			
1994	10	1,146	492,000		307	2	350	265,450		631 ^d	1	4,960	290		
1995	-	3,110	1,250		290		1,855	182		517		6,455	350		68
1996	5	1,813	74,100		367		799	34,520		723		5,390			
1997	-	2,975	1,200		57	4	956	65		544	1	627			96
1998	-	630	372,850		322	3	335	179,680		515	1	2,828	7180		
1999	-	1,697	180		217		375	345		620		55			
2000	-	10	12,608		912	24	4,051	41,850		1,135 ^d		819	640		11
2001	-	3,746	115		750	7	2,859	3,138		2,418		3,612	4		213

^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.

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	-	-	245	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	4,361 ²	1,924,935 ²	-	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 ¹	-	-	163	1,040	7,400 ¹	-	-
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 ¹	684,780	-	-	133	3,505 ¹	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 ⁴	-	-	-	-	805	-	-	-	-	414
2001	50	11,635	8	-	1,509	8	3,220	1,744	-	1,055	33	3,533	1,038	-	155

^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.¹ Helicopter survey.² Boat survey.³ Foot survey.⁴ Includes counts from Casadepaga and Ophir Creeks.⁵ Includes counts from Ophir Creek.⁶ Numerous pink salmon made enumerating of chum salmon difficult; pink count may include some chum.

Year	Ninkluk River					Kwinik River					Tubutulik River				
	Chinook	Chum	Pink	Pink & Chum ^b	Coho	Chinook ^d	Chum ^d	Pink ^d	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							
1967		20,546				13	24,444	3,508							
1968				87,085		27	18,813	126,764			1			22,475	
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 ^e		10,500	22,600			65	30,686	62,461					8,070	21,100	
1973		14,365	14,790			57	28,617	38,420							
1974	1	8,720	8,915			62	35,899	40,816			131	5,383	15,665		
1975		10,089	16,258			44	14,344	57,317			136	9,560	17,940		
1976		4,130	7,190			12	6,977	29,471			7	17,141	38,003		
1977	19	10,456	4,150			84	22,757	46,234				1,095	6,095	2,600	
1978	2	14,365	208,300			74	14,408	72,270				8,540	4,685		
1979 ^g	8	10,127	30,147			107	12,355	167,492			2	5,865	1,364		
1980		8,915	75,770			177	19,374	320,389				812	1,624		
1981		7,249				136	34,561	566,534			405	21,616	663,937		
1982	20	2,557	227,540			138	44,036	469,674							
1983	54	8,886	50			267	56,907	254,538			49	2,044	53,605		
1984 ^f	6			57,208	3,072	736	54,043	663,533		983	135	16,345	40,790		
1985	25	11,140			332	712	9,912	18,237		673	139	56,210	93,600		
1986	2	2,442	0			653	24,704	241,446		421	472	13,645	8,940		
1987	10	4,145	0		257	314	16,134	5,567		819	453	5,975	35,680		
1988	18	6,501	8,160		1,095	321	13,301	187,991		444	474	9,605	580		
1989					182	282	13,689	27,488			561	4,660	114,450		
1990		6,200			170	744	13,735	416,512		746					
1991	24	10,660	37,410		1,783	587	18,802	53,499		809	397	4,350	186,400		
1992		7,770	803,200		812	479	12,077	1,464,717		532	661	7,085	26,870		
1993	15	19,910	2,840		2,104	565	15,823	43,065		1,238	260	2,595	138,600		
1994	7	16,470	1,294,100		274	627	33,010	2,306,481		2,841	1,061	8,740	18,650		1,395
1995	48	25,358	200		2,136	468	42,161	17,509		1,625	No survey due to poor conditions				
1996	25	9,732	153,150		2,047	567	27,256	907,894		1,410	377	16,158	4,020		930
1997	131	16,550			983	972	20,118	9,536		610	439	10,790	226,750		
1998	51	2,556	205,110		593	296	24,248	655,933		610	1,946	3,105	16,890		
1999		640			619	114	8,342	607		223	894	10,180	112,480		
2000	53	26,724	945,354		10,064	144	12,251	750,173		541					0
2001	30	30,662	41,625		3,468	252	16,598	8,423		9,533	77	863			

^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.

North River					
Year	Chinook	Chum	Pink	Pink & Chum ^b	Coho
1961					
1962	162	-	-	16,087	-
1963 ^a	287	-	-	73,274	-
1964	23	-	-	5,981	-
1965	153	-	-	16,600	-
1966					
1967					
1968					
1969					
1970 ^c	1	20,655	12,400	-	-
1971 ^a	256	-	-	1,047	-
1972 ^d	561	2,332	54,934	-	-
1973 ^d	298	4,332	26,542	-	-
1974 ^d	220	861	154,285	-	-
1975 ^e	60	5,237	17,885	-	-
1976 ^e	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 ^j	-	340
1989 ^c	-	-	-	-	-
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 ^c
1996	106	220 ^l	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
2001	1,337	6,515	24,737	-	12,383

^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 - 2001.

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	^e						
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
2001	^e 160	84	3,692	1,299	1,183	1,910	8,167

^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 -2001.

Year	Salmon Lake	Grand Central River	Total
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
2001	9,400	155	9,555

^a No survey made.

^b Boat survey.

^c Poor survey.

^d Early count

Appendix Table C.1. Kotzebue District Chum Salmon Catch Statistics 1962-2000 and 2001.

Year	Total Catch	Total Days ^a	Boat Days ^b	Catch/Boat Day	Number Fishermen ^c	Season Catch per Fisherman
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	1,031	92	3,160
1996 ^h	82,110	6.0	76	1,080	55	1,493
1997	142,720	16.5	330	432	68	2,099
1998	55,907	13.0	187	300	45	1,242
1999	138,605	13.5	212	654	60	2,310
2000	159,802	14.0	283	565	64	2,497
Average	214,288	22.1	1,585	207	129	1,606
2001 ⁱ	211,672	15.3	307	689	66	3,207

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 Sikusuilaq 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.

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

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

Appendix Table C2. Kotzebue District chum salmon type of processing and weights, 1962-2001.

Year	Chum Salmon		Other ^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		
2001		1,847,361	64		

^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, 1962-2001.^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	\$200,000
1972	\$260,000
1973	\$925,000
1974 ^b	\$1,822,784
1975 ^c	\$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
2000	\$246,789
Average	\$669,625
2001	\$322,650

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 Sikusuilaq Springs Hatchery terminal fishery.

Appendix Table C4. Kotzebue District mean prices paid per pound to salmon fishermen by species, 1962-2001.

Year ^a	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
2001	8.7	\$0.17	\$1.00			

^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, 1914-2001.

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	27	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 ^b	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 ⁿ	375	97	189,681
1995	290,720	5	290,725	102,880	593	173	393,615
1996	82,110 ^m	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
2001	211,672	6	211,678	49,232	408	121	260,910
1979-2001				1994-2001			
Average	243,509	189	243,698	Average	69,410	484	147

^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 Sikusuluaq 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, 1962-2001.

Year	Village				Kobuk			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	^b	^b	^b	^b	^b	^b	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 ^a
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 ^a	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	^b	^b	^b	^b	^b	^b	13,723
1989	^b	^b	^b	3,894	^b	3,894	1,595	^b	^b	^b	^b	^b	^b	5,489
1990	4,353	^b	^b	^b	^b	4,353	3,915	^b	^b	^b	^b	^b	^b	8,268
1991	6,855	^b	^b	4,248	^b	11,103	3,637	^b	^b	^b	^b	^b	^b	14,740
1992	8,370	^b	^b	3,890	^b	12,260	2,043	^b	^b	^b	^b	^b	^b	14,303
1993	8,430	^b	^b	3,730	^b	12,160	3,270	^b	^b	^b	^b	^b	^b	15,430
1994	8,157	1,891	2,860	7,982	5,722	26,612	6,126	^b	3,488	^b	^b	^b	^b	36,226
1995	15,485	5,985	8,558	5,880	2,959	38,867	6,359	50,708	^b	^b	^b	^b	6,947	102,881
1996	13,611	5,935	9,062	8,649	1,819	39,076	10,091	50,573	^b	^b	^b	^b	^b	99,740
1997	14,323	3,064	2,713	5,513	629	26,242	5,309	26,355	^b	^b	^b	^b	^b	57,906
1998	9,845	3,414	2,432	4,676	1,031	21,398	2,614	24,968	^b	^b	^b	^b	^b	48,980
1999	17,843	3,788	590	3,868	1,869	27,958	1,616	64,768	^b	^b	^b	^b	^b	94,342
2000	10,391	2,876	5,009	2,944	318	21,538	7,293	37,144	^b	^b	^b	^b	^b	65,975
2001	16,540	5,500	^b	4,310	2,843	29,193	2,326	17,713	^b	^b	^b	^b	^b	49,232

^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, 1962-2001.

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
2001	23	24	152	62	^a	94	109	^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, 1962-2001 . (p. 1 of 5)

Stream ^{a,n}	1962	1963	1964	1965	1966	1967	1968	1969	1970
Noatak Drainage									
Noatak River below Kelly River	168,000 ^d	1,970 ^{h,j}	89,798	6,152 ^{h,j}	101,640	29,120 ^b	39,394	33,945	
Eli River	9,080 ^d	35			120		5,502 ^f	68 ^f	138,145
Kelly River & Lake	1,818 ^d	600		3,155	570	225	375	150	
Noatak River System Total	178,898	2,605	89,798	9,307	102,330	29,345	45,271	34,163	
Kobuk Drainage									
Kobuk to Pah River		400		1,750	266		530		
Pah River to just below Selby River		1,530		500			50		1,753
Selby River mouth & Slough		1,045		500	630	1,625	70		20
Selby R. mouth to Beaver C.		1,095				75	170		4,820
Beaver Creek mouth					460	795	1,550		2,385
Above Beaver Creek		465			118				4,930
Upper Kobuk River Total	9,224^d	4,535	7,985^h	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 ^h
Kobuk River System Total	38,835^c	8,940	28,032	11,480	8,164	8,112^c	13,306	16,934	2,000^h

(continued)

Appendix Table C8. (p. 2 of 5)

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

(continued)

Appendix Table C8. (p. 3 of 5)

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

(continued)

Appendix Table C8. (p. 4 of 5)

Stream ^{a,b}	1989 ^c	1990 ^b	1991	1992 ^b	1993	1994 ^d	1995	1996	1997
Noatak Drainage									
Noatak River below Kelly River		23,345 ^b	82,750	34,335	25,415		147,260	306,900	
Eli River		3,000	2,940	701	4,795		7,860	30,040	
Kelly River & Lake		325 ^f	654	726	9		8,384	1,427	2,792
Noatak River System Total		26,670	86,344	35,762	30,219		163,504	338,367	
Kobuk Drainage									
Kobuk to Pah River		4,610	9,840	1,030	3,896		12,190	20,700	2,248 ^b
Pah River to just below Selby River		305	2,780	3,820	1,535		4,537	4,600	404 ^b
Selby River mouth & slough		420	1,040	1,500	1,800		1,250	4,100	662 ^b
Selby River		7,505	1,460	868	824		3,364	14,950	853 ^b
Selby R. mouth to Beaver C.			5,250	3,845	929		10,898	15,480	2,582 ^b
Beaver Creek mouth		2,515							914 ^b
Above Beaver Creek			4,155	740	3,174		3,486	14,940	850 ^b
Upper Kobuk River Total		15,355	24,525	11,803	12,158		35,725	74,770	8,513 ^b
Squirrel River		5,500	4,606	2,765	4,463		10,605	10,740	4,779 ^b
Salmon River		6,335	5,845	1,345	13,880		13,988	23,790	1,181 ^b
Tutuksuk River		2,275	744	1,162	1,196		3,901	21,805	163 ^b
Kobuk River System Total		29,465	35,720	17,075	31,697		64,219	131,105	

(continued)

Stream ^{a,b}	1998	1999	2000 ^k	2001	Aerial Escapement Goals
Noatak Drainage					
Noatak River below Kelly River	^b				
Eli River	^b				
Kelly River & Lake	2,631				
Noatak River System Total	^a	84,085			84,000
Kobuk Drainage					
Kobuk to Pah River	^b			2,790	
Pah River to just below Selby River	^b			1,380	
Selby River mouth & slough	^b			1,780	
Selby River	730				
Selby R. mouth to Beaver C.	^b			7,470	
Beaver Creek mouth	^b				
Above Beaver Creek	^b				
Upper Kobuk River Total	^b	27,340		13,420	10,000
Squirrel River	^b	13,513			11,500
Salmon River	^b	4,989			7,000
Tutuksuk River	^b	2,906			2,000
Kobuk River System Total		48,748			30,500

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

^b Poor survey conditions or incomplete, early or late survey.

^c Survey by foot or boat.

^d These fish are unidentified salmon, mostly chums.

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

^f Unresolvable discrepancies in historical data put this figure in question.

^g Unclear where these fish were observed.

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

ⁱ Surveyed well before peak of migration.

^j Unacceptable conditions.

^k No surveys flown in 2000.

Appendix Table D1. Norton Sound herring and spawn-on-kelp harvests
(in tons) by U.S. commercial fishermen, 1909-2001.

Year	Spw Herring	Food or Bait Herring	Total	Spawn on Kelp
1909-1916 ^a	-	-	-	-
1916-1928	-	1,881	1,881	-
1929	-	166	166	-
1930	-	441	441	-
1931	-	86	86	-
1932	-	529	529	-
1933	-	31	31	-
1934	-	4	4	-
1935	-	15	15	-
1936	-	-	-	-
1937	-	6	6	-
1938	-	10	10	-
1939	-	6	6	-
1940	-	14	14	-
1941	-	3	3	-
1942-1963	-	-	-	-
1964	20	-	-	-
1965	-	-	-	-
1966	12	-	-	-
1967	-	-	-	-
1968	-	-	-	-
1969	2	-	-	-
1970	8	-	-	-
1971	20	-	-	-
1972	17	-	-	-
1973	35	-	-	-
1974	2	-	-	-
1975	-	-	-	-
1976	9	-	-	-
1977	11	-	-	trace
1978	15	-	-	4
1979	1,292	-	-	13
1980	2,451	1	2,452	24
1981	4,371	-	-	47 ^b
1982	3,864	69	3,933	38
1983	4,181	401	4,582	29 ^c
1984	3,298	274	3,572	19 ^d
1985	3,420	128	3,548	- ^e
1986	4,926	268	5,194	-
1987	3,779	303	4,082	-
1988	4,256	416	4,672	-
1989	4,494	247	4,741	-
1990	5,253	1,026	6,279	-
1991	5,465	207	5,672	-
1992 ^f	-	-	-	-
1993	4,713	321	5,034	-
1994	958	2	960	-
1995	6,647	116	6,763	-
1996 ^g	6,061	109	6,270	-
1997 ^h	3,709	262	3,976	-
1998	2,623	8	2,631	9 ⁱ
1999	2,693 ^j	53	2,746	4
2000	4,487 ^k	-	4,487	2
2001	2,245	-	2,245	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 *Macrocystis* kelp.

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

^f No commercial fishery took place in 1992.

^g Total includes an estimate 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 2,300 lbs of wild kelp and 36,883 pounds of *Macrocystis* kelp.

^j Includes an estimate 5 st of wastage.

^k Includes an estimate 15 st of wastage.

Appendix Table D2.

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

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

Appendix Table D3. Commercial herring fishery summary information, Norton Sound District, 1979-2001.

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

^a No fishery due to late sea ice breakup.

^b Date of peak aerial survey biomass estimate, typically one or two days prior to peak catch.

Appendix Table D4. Norton Sound commercial herring harvest (tons) by subdistrict, by year, 1979 - 2001.

Year ^a	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 ^b
1997	2,046	62	1,864	0	0	0	0.5 ⁱ	3,976 ^h
1998	1,543	0	1,081	0	0	0	0	2,624
1999	285	323	2,050	0	0	0	8	2,746 ^k
2000 ^l	2,623	81	1,767	0	0	0	0	4,471
2001 ^l	898	0	1,347	0	0	0	0	2,245

^a Includes herring taken for sac roe and bait.

^b Does not include an estimated 90 st of wastage.

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

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

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

^f No commercial fishery in 1992.

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

^h Does not include an estimated 50 st of wastage.

ⁱ Does not include an estimated 5 st of wastage.

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

^k 75.8 tons added to sac roe total due to dewatering by buyers. 3 tons added to bait total due to dewatering by buyer.

Does not include an estimated 5 st of wastage.

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

Appendix Table E1. Historical commercial summer harvest of red king crab from Norton Sound Section, Eastern Bering Sea, by statistical areas, 1977-2001(catch in pounds). (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

-Continued-

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Appendix Table E1. (page 2 of 2)

Statistical Area	153												
	1990	1991 ^a	1992	1993	1994	1995	1996 ^b	1997	1998	1999	2000	2001	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	61,620	193,765
626402													38,995
636330							4,560	3,838	2,449			2,253	13,100
636401			1,159	1,373	8,087	24,329	70,677	59,206	10,771	14,201	126,994	91,343	543,449
636402					1,754	3,466							5,220
646301						4,628	13,888						18,516
646330						1,493	2,894	314		3,021		1,868	19,518
646401				1,963	37,222	105,045	22,834	1,052	3,194	221		4,287	350,641
646402				730	143,511	66,821							292,779
656300													176,873
656330			4,814	265		19,745	15,446	4,661	4,078	1,300		20,869	1,099,325
656401	171		53,119	105,341	29,566	32,289	9,985	4,035	1,127	2,739	94,813	55,158	1,863,117
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	7,030	1,542,316
666401	162,263		10,632	746	396		3,001	1,816		930	60,762	43,771	2,660,350
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	297,654	288,199	13,017,673

^a No commercial fishery occurred in 1991.

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

Appendix Table E2. Percentage of recruit and postrecruit male red king crab from summer commercial fishery catch samples Norton Sound Section, Bering Sea, 1977-2001.

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

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

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

^c No Summer Commercial Fishery in 1991.

Appendix Table E3. Historical summer commercial red king crab fishery economic performance, Norton Sound Section, Eastern Bering Sea, 1977 - 2001.

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

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^a Deadloss included in total.

^b Millions of pounds.

^c No summer commercial fishery.

^d Information not available.

^e Fishing actually began 8/12.

^f Fishing actually began 7/8.

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

^h First delivery was made 7/10.

ⁱ First delivery was made 7/16.

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

^k Open access fishery closed 8/29/00. CDQ fishery ran from 9/1/00 - 9/29/01

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

Appendix Table E4. Winter commercial and subsistence red king crab harvests, Norton Sound, Eastern Bering Sea, 1978 - 2001.

Year ^a	Commercial			Subsistence									
	Fishers	# Crab Harvested	Winter ^b	Permits Issued	Permits Returned	Permits Fished	Total Crab Caught ^c	Total Crab Harvested ^d	Average/ permit fished				
1978	37	9,625	1977-78	290	206	149	°	12,506	84				
1979	1	221	1978-79	48	43	38	°	224	6				
1980	1	22	1979-80	22	14	9	°	213	24				
1981	0	0	1980-81	51	39	23	°	360	16				
1982	1	17	1981-82	101	76	54	°	1,288	24				
1983	5	549	1982-83	172	106	85	°	10,432	123				
1984	8	856	1983-84	222	183	143	15,923	11,220	78				
1985	9	1,168	1984-85	203	166	132	10,757	8,377	63				
1986	5	2,168	1985-86	136	133	107	10,751	7,052	66				
1987	7	1,040	1986-87	138	134	98	7,406	5,772	59				
1988	10	425	1987-88	71	58	40	3,573	2,724	68				
1989	5	403	1988-89	139	115	94	7,945	6,126	65				
1990	13	3,626	1989-90	136	118	107	16,635	12,152	114				
1991	11	3,800	1990-91	119	104	79	9,295	7,366	93				
1992	13	7,478	1991-92	158	105	105	15,051	11,736	112				
1993	8	1,788	1992-93	88	79	37	1,193	1,097	30				
1994	25	5,753	1993-94	118	95	71	4,894	4,113	58				
1995	42	7,538	1994-95	167	71	57	5,918	4,059	71				
1996	9	1,778	1995-96	84	44	35	2,936	1,679	48				
1997	2	83	1996-97	38	22	13	1,617	745	57				
1998	5	984	1997-98	94	73	64	20,327	8,622	135				
1999	5	2,714	1998-99	95	80	71	10,651	7,533	106				
2000	10	3,045	1999-2000	98	64	52	9,816	5,723	107				
2001	3	1,098	2000-2001	50	27	12	366	256	21				
Avg 1978-2000	10	2,395	Avg 1977-2000	121	93	72	9099	5,701	70				

^a Prior to 1985 the winter commercial fishery occurred from January 1 - April 30; As of March 1985, fishing may occur from November 15 - May 15.

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

^c The number of crab actually caught; some may have been returned.

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

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

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

^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, 1983-2001.^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
2001	23	16	39 ^d	14	48	61

^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- 2001.

Year ^b	No. of Fishers	No. of Fish	Pounds ^a		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 ^e						
1995	1	226	2,240	9.9	\$0.50	\$1,120
1996	2	308	3,002	9.7	\$0.44	\$1,321
1997 ^r						
1998	1	254	2,400	9.4	\$0.43	\$1,032
1999 ^c						
2000 ^e						
2001	1	19	200	10.5	\$1.00	\$200

^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, 1966-2001.

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

^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, 1966-2001.

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

^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 14. Kotzebue District incidentally caught and sold Dolly Varden during the commercial salmon fishery, 1966-2001.

Year	Number of Fish Sold	Estimated Total Catch ^a	Pounds Sold	Average Weight ^d	Average Price ^f
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	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	138	^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
2001	0	^h	0		

^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.

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

^b 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, 1959-2001.

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 ^b	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			11,220
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 ^g			3,315
2001 ^g			2,702

^a From Shario, 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 1968-2001.

Year ^a	Noatak River Spawner Survey ^b	Overwintering	
		Wulik River ^c	Kivalina River ^c
1968		90,236	27,640
1969		297,257	
1976		68,300	12,600
1977 ^d			
1978 ^d			
1979		55,030	15,744
1980		113,553	39,692
1981	7,922	101,826	45,355
1982	8,275	65,581	10,932
1983	2,924 ^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	^f
2001	^f	92,614	^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 Nimiuktuk did not allow a count.

Appendix Table F7. Subsistence whitefish catch and effort in the Kotzebue District, 1970-2001.

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

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

^b Data unavailable.

^c Subsistence harvest information from Kiana and Shungnak villages only.

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

^e Subsistence harvest information from Noorvik and Shungnak villages only.

^f Number of households contacted. Subsistence harvest information from Arnbler, 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.

<u>Common Name</u>	<u>Scientific Name</u>
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 pallasi</i>
Rock flounder	<i>Lepidosetta bilineata</i>
Rock greenling (terpug)	<i>Hexagrammus lagocephalus</i>
Round whitefish	<i>Prosopium cylindraceum</i>
Sculpins	<i>Cottidae</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>Gasteroosteus aculeatus</i>
Ninespine stickleback	<i>Pungitius pungitius</i>
Tubenose 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 associated cooperative studies
Conducted within the Norton Sound, Port Clarence, and Kotzebue
Districts, 2001.

HERRING

Herring Test Fishing

- a)Location: Norton Sound ocean waters; ADF&G camps located at Cape Denbigh and Klikitarik; a third test fish crew operated out of Unalakleet with additional funding from Norton Sound Economic Development Corporation (NSEDC).

- 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. ADF&G project.

- 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 operated by Kawerak Incorporated, Bering Sea Fishermen's Association (BSFA), Norton Sound Initiative (NSI) 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. ADF&G project with additional funding from NSI and NSEDC.

- 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.

Appendix G2. (continued)

Niukluk River Salmon Counting Tower

- a)Location: About five miles upstream from the mouth of the Niukluk River in Norton Sound. ADF&G project with additional funding from NSI and NSEDC.
- 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.

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 operated by Kawerak Incorporated and funded by Kawerak Incorporated, BSFA, NSI and NSEDC. 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. ADF&G project with additional funding from NSI and NSEDC.
- 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 operated by Kawerak Incorporated and funded by Kawerak Incorporated, BSFA, NSI and NSEDC. Determine daily and seasonal timing and magnitude of the salmon escapements.

Appendix G2. (continued)

Glacial Lake Salmon Counting Weir

- a)Location: A 986 acre lake at the headwaters of the Sinuk River which drains into the Bering Sea.
- b)Description: Bureau of Land Management (BLM) project. 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 weir trap, beach seining or carcass sampling.

Northwest Salmon Biological / Rehabilitation Projects

1). Hobson Creek Instream Incubation Project. ADF&G project with additional funding from NSI and NSEDC.

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

2). 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: ADF&G project with additional funding from NSEDC and BLM. 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.

Kobuk River Test Fish Project

- a)Location: Lower Kobuk River near Kiana. ADF&G project.
- 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: ADF&G project with assistance from Kawerak Incorporated. 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: ADF&G project. 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, 2001.

Company	Address	Type of Processing	District
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
Norton Sound Seafood	Box 323 Unalakleet, AK	Frozen/Fresh Salmon Herring Roe on Kelp King Crab	Norton Sound
Great Pacific Fisheries	Anchorage, AK	Fresh Salmon	Kotzebue
Norquest Seafoods	5245 Shilshole Ave NW Seattle, WA 98107	Frozen Herring	Norton Sound
Trident Seafoods	5303 Shilshole Ave NW Seattle, WA.	Frozen Herring	Norton Sound

**NORTON SOUND AND SEWARD PENINSULA AREA
2001 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? _____

 P.O. Box (if new) _____

*1. Did your household catch salmon for subsistence use this year (including with a rod-and-reel)?
 No _____ Yes _____
 *2. Does your household usually subsistence fish for salmon? No _____ Yes _____

FISHING HOUSEHOLDS ("Yes" to #1)

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

CHUM _____ 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
2001 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?

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

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

NOATAK RIVER AREA
2001 SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY

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

Community: _____
Survey Date: _____
Interviewer: _____

Household Head Name: _____
*Household Size _____
If new household, where were you living last year? _____

(If new household) P.O. Box: _____

- *1. Did your household catch salmon for subsistence use or with a rod-and-reel this year? No _____ Yes _____
- *2. Does your household usually subsistence fish for salmon? No _____ Yes _____

FISHING HOUSEHOLDS ("Yes" to #1)

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

CHUM _____ 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)

NOATAK RIVER AREA

2001 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?

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

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

KOBUK RIVER AREA
2001 SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY

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

Community: _____
 Survey Date: _____
 Interviewer: _____

Household Head Name: _____
 *Household Size _____
 If new household, where were you living last year? _____

 (If new household) P.O. Box: _____

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

No _____ Yes _____

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

No _____ Yes _____

FISHING HOUSEHOLDS ("Yes" to #1)

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

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
 ("DOGS") ("KINGS") ("HUMPES") ("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") ("HUMPES") ("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") ("HUMPES") ("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)

KOBUK RIVER AREA

2001 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&C 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?

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

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

Appendix G7. Emergency Orders issued during 2001.

Emergency Order Number	Effective Date	Action Taken	Comments
3 -S-Z-1-01	June 15, 2001	<p>This emergency order closes the Nome Subdistrict to all Tier I subsistence salmon fishing effective June 15 until further notice. In addition, this emergency order establishes regular weekly Tier II marine water fishing periods which begin at 6:00 p.m. Tuesday and run until 6:00 p.m. Friday. Marine waters from Cape Nome to Topkok Head will open on Tuesday June 26. Department staff anticipates a harvestable surplus of approximately 2,000 chum salmon. The Board of Fisheries has mandated that a harvestable surplus of less than 3,430 be managed as a Tier II fishery. Only Tier II permit holders will be allowed to subsistence fish for salmon in the Nome Subdistrict.</p>	<p>For the past decade the chum salmon fisheries of the Nome Subdistrict have been weak. Although limited rebuilding has occurred the chum salmon returns are far weaker than those prior to 1987. Once again, the waters of the Nome Subdistrict are being closed to provide chum salmon spawning stock. Chum salmon are beginning to arrive in local waters at this time. The chum salmon stock of the Nome Subdistrict is judged insufficient to support the full subsistence need of the residents of the Nome Subdistrict. Tier II fishing rules will allow those residents determined to be the longest users and the most dependent users of the salmon to meet their harvest needs. The other salmon species present in the Nome Subdistrict during July are not present in sufficient numbers to provide for subsistence needs without also harvesting chum salmon. Chinook and sockeye salmon are very limited in number and although desirable as food, have always been caught incidentally to the chum salmon. Odd year pink salmon returns during the last ten years have been depressed to the point of barely providing adequate spawning stock while supporting virtually no harvest. The Tier I closure of these other salmon species is necessary for both conservation and to allow the orderly management of the Tier II fishery. Subsistence fishing for Tier II permit holders will begin 6:00 p.m. June 26 and will run until 6:00 p.m. June 29 in the marine waters from Topkok Head to Cape Nome. As the salmon run develops, harvestable surpluses are anticipated in several local streams. Tier II openings will be announced in those streams beginning shortly after the Fourth of July in order to provide for ideal drying conditions. Tier II permit holders will be limited to 100 chum salmon each. The permit holders will find that in no individual location will they be allowed to take all 100 salmon. They will be required to spread their harvest over two or more locations so that fishing impacts will be spread over a broader area.</p>
3-S-Z-2-01	July 3, 2001	<p>This emergency order opens Norton Sound Subdistrict 2 to commercial salmon fishing for one 48-hour period. The fishing period will run from 6:00 p.m. Sunday, July 1, 2001 until 6:00 p.m. Tuesday, July 3, 2001 with gillnets restricted to six-inch or smaller mesh size.</p>	<p>Based on the management plan, approved by the Board of Fisheries at the January 2001 meeting, the department will use an escapement based management strategy in the Golovin subdistrict. Historically, commercial fishing effort has been low in the Golovin Subdistrict, and the management plan allows for a maximum harvest of 15,000 chum salmon in the commercial fishery prior to July 15th. The 15,000 chum salmon harvest level is set at one-third the historical harvest average and based on fishing effort should allow for a relatively high quality harvest before the run is adequately assessed in mid-July. The escapement objective in the Golovin Subdistrict is for a combined aerial survey index of the Fish, Niukluk, and Boston Rivers of 23,200 to 46,400 chum salmon. The Niukluk River counting tower has provided escapement counts since 1995 and escapement counts into the Niukluk River drainage has exceeded the low end of the escapement aerial survey index objective each year. The gillnets are restricted to six inch or smaller mesh size to concentrate the harvest on chum salmon and for the conservation of chinook salmon. Commercial fishermen are reminded that any unsold salmon caught in commercial gear and kept must be reported on their fish tickets.</p>

Appendix G7. Emergency Orders issued during 2001.

Emergency Order Number	Effective Date	Action Taken	Comments
3-S-Z-3-01	July 5, 2001	This emergency order opens Norton Sound Subdistricts 5 and 6 to commercial salmon fishing for one 24-hour period. The fishing period will run from 6:00 p.m. Thursday, July 5, until 6:00 p.m. Friday, July 6, with unrestricted mesh size gillnets.	Based on subsistence catch data and the department's test net in the Unalakleet River, chinook salmon have been present in the nearshore waters of eastern Norton Sound for approximately three weeks with increasing numbers entering the Unalakleet River this past week. The chinook run has been later than usual and historically late runs have not been strong runs. The department is concerned that the chinook salmon return is weak. A similar situation is occurring throughout much of western Alaska as chinook salmon runs have been weak. Subsistence fishing reports have been mixed with some saying it is worse than usual and some saying it is better than usual. At this time some subsistence fishers have reported satisfying their needs for chinook salmon while others seem to be harvesting more than usual. Based on catches in the department test net, the chinook return appears below average in run strength. Test fish catches indicate that the chum salmon run is weaker than the 2000 chum run, but stronger than the poor chum runs of the late 1990s. Under normal run timing approximately two-thirds of the chinook salmon and approximately one-quarter of the chum salmon have passed into the Unalakleet River. This opening is intended to test the abundance of salmon in the waters of eastern Norton Sound. Therefore, this period will be limited to reduced fishing time as a conservation measure. The department will consider escapement, subsistence use, and commercial fishing results before scheduling additional periods. Commercial fishermen are reminded that any unsold salmon caught in commercial gear and kept must be reported on their fish tickets.
3-S-Z-4-01	July 5, 2001	This emergency order opens Norton Sound Subdistrict 2 to commercial salmon fishing for one 48-hour period. The fishing period will be open from 6:00 p.m. Thursday, July 5, 2001 until 6:00 p.m. Saturday, July 7, 2001 with gillnets restricted to six-inch or smaller mesh size.	Based on the management plan, approved by the Board of Fisheries at the January 2001 meeting, the department will use an escapement based management strategy in the Golovin subdistrict. Historically, commercial fishing effort has been low in the Golovin Subdistrict, and the management plan allows for a maximum harvest of 15,000 chum salmon in the commercial fishery prior to July 15th. The 15,000 chum salmon harvest level is set at one-third the historical harvest average and based on fishing effort should allow for a relatively high quality harvest before the run is adequately assessed in mid-July. The escapement objective in the Golovin Subdistrict is for a combined aerial survey index of the Fish, Niukluk, and Boston Rivers of 23,200 to 46,400 chum salmon. The Niukluk River counting tower has provided escapement counts since 1995 and escapement counts into the Niukluk River drainage has exceeded the low end of the escapement aerial survey index objective each year. At this time the Niukluk River is not operational because of high water. In the adjacent subdistrict the chum escapement is at 70% of the goal which is historically about twice the average escapement by this date. With strong escapement nearby and the history of the rivers of the Golovin Subdistrict consistently meeting escapement the department believes that escapement and subsistence needs are being met at this time. The first 48-hour period had a harvest of approximately 1,300 chum salmon. Fishing effort was low as only 3 permit holders fishing. Weather deteriorated the second day of the period and some nets did not fish the entire period. As fishing effort is low, two periods a week should not exceed the harvest goal or result in escapement not being met in the Golovin Subdistrict. The gillnet mesh restriction to six inch or smaller is to concentrate the harvest on chum salmon and to provide for conservation of chinook salmon. Commercial fishermen are reminded that any unsold salmon caught in commercial gear and kept must be reported on their fish tickets.

Appendix G7. Emergency Orders issued during 2001.

Emergency Order Number	Effective Date	Action Taken	Comments
3-S-Z-5-01	July 9, 2001	This emergency order opens Norton Sound Subdistricts 5 and 6 to commercial salmon fishing for one 24-hour period. The fishing period will run from 6:00 p.m. Monday, July 9, until 6:00 p.m. Tuesday, July 10, with unrestricted mesh size gillnets.	Catches for king salmon were average in both districts for king salmon for this date. The chum catch was average in Shaktoolik and below average in the Unalakleet Subdistrict. The difference may be because of the fisher's option to fish king gear or chum gear and there are indications that more fishers were using chum gear in the Shaktoolik Subdistrict. The test net is tracking slightly below the 10-year average for king catches. For chum salmon the test net is tracking at the 10-year average. The North River tower recently became operational, and has only four days of data. Daily counts are within the normal range based on historical passage. An aerial survey of the Unalakleet River was unsuccessful because of turbid water. The survey on the North River revealed few king or chum salmon above the tower site. As fishing was delayed this year because of the late run and the first commercial period yielded average results, it is possible that the king run is weak. For chum salmon the test net is at the historical 35% point of the run and catches have been tracking at the 10-year average. However, several years in the late 1990s had poor chum escapements and test net catches of chum were poor which results in the 10-year average being lower than desirable. The department still has concerns for that the king salmon run is weak, but historically, by July 9 the commercial fishery is past the 95% point of the harvest. For chum salmon the commercial fishery is near the midpoint date of the historical harvest. This opening is intended to test the abundance of chum salmon in the waters of eastern Norton Sound. Fishers will have the choice to fish king gear or chum gear. Likely most will fish chum gear, but the unrestricted mesh size allows those fishers who want to target king salmon to be able to do so. As this is the end of the king run, few kings are expected to be harvested. But, because of concerns for both the chinook and chum runs this period will have reduced fishing time as a conservative measure.
3-S-Z-6-01	July 9, 2001	This emergency order opens Norton Sound Subdistrict 2 to commercial salmon fishing for two 48-hour periods. The first fishing period will be from 6:00 p.m. Monday July 9, 2001 until 6:00 p.m. Wednesday, July 11, 2001. The second period will be from 6:00 p.m. Thursday July 12, 2001 until 6:00 p.m. Saturday, July 14, 2001.	Historically, commercial fishing effort has been low in the Golovin Subdistrict, and the management plan allows for a maximum harvest of 15,000 chum salmon in the commercial fishery prior to July 15th. The 15,000 chum salmon harvest level is set at one-third the historical harvest average and based on fishing effort should allow for a relatively high quality harvest before the run is adequately assessed in mid-July. The escapement objective in the Golovin Subdistrict is for a combined aerial survey index of the Fish, Niukluk, and Boston Rivers of 23,200 to 46,400 chum salmon. The Niukluk River counting tower has provided escapement counts since 1995 and escapement counts into the Niukluk River drainage has exceeded the low end of the escapement aerial survey index objective each year. At this time the Niukluk River is not operational because of high water. In the adjacent subdistrict the chum escapement is at 75% of the goal which is historically about 1.5 times the average escapement by this date. With strong escapement nearby and the history of the rivers of the Golovin Subdistrict consistently meeting escapement the department believes that escapement and subsistence needs are being met at this time. The cumulative harvest after two fishing periods is 4,800 chum salmon. Fishing effort has been low with only 4 permit holders fishing. As fishing effort is low, two periods a week should not exceed the harvest goal or result in escapement not being met in the Golovin Subdistrict. The gillnet mesh restriction to 1/2 inch or smaller is to concentrate the harvest on chum salmon and to provide for conservation of chinook salmon. Commercial fishermen are reminded that any unsold caught in commercial gear and kept must be reported on their fish tickets.

Appendix (17). Emergency Orders issued during 2001.

Emergency Order Number	Effective Date	Action Taken	Comments
3-S-Z-7-01	July 9, 2001	This emergency order opens Norton Sound Subdistrict 3 to commercial salmon fishing for two 24-hour periods. The first fishing period will be from 6:00 p.m. Monday July 9, 2001 until 6:00 p.m. Tuesday, July 10, 2001. The second period will be from 6:00 p.m. Thursday July 12, 2001 until 6:00 p.m. Friday, July 13, 2001.	The chum salmon escapement at the Kwiniuk River tower is now at the 75% of the lower end goal of the escapement range. Using historical run timing models, early, average, and late all show that the low end of the escapement goal range will be reached. Fishing effort is expected to be low as a commercial fishing period is also occurring simultaneously in the Golovin Subdistrict and each Golovin Subdistrict commercial fishing period is for 48 hours. In addition many residents of Elim are working on numerous construction projects occurring in Elim and this will likely reduced the number of permits holders willing to take a day off of work to fish. As the low end of the escapement goal is likely to be met and effort will be low the two commercial fishing periods will provide some economic opportunity to those residents who would like to commercial fish without jeopardizing the escapement or subsistence.
3-S-Z-8-01	July 14, 2001	This emergency order opens the fresh waters west of the Safety Sound bridge and the Eldorado and Flambeau Rivers to Tier II subsistence fishing for 48 hours from 6:00 p.m. Saturday, July 14, 2001 until 6:00 p.m. Monday, July 16, 2001. Only Tier II permit holders will be allowed to subsistence fish for salmon in the in the waters west of the Safety Sound bridge and the Eldorado and Flambeau Rivers.	For the past decade the chum salmon fisheries of the Nome Subdistrict have been weak. Although limited rebuilding has occurred the chum salmon returns are far weaker than those prior to 1987. Once again, the waters of the Nome Subdistrict are being closed to provide chum salmon spawning stock. Chum salmon are beginning to arrive in local waters at this time. The chum salmon stock of the Nome Subdistrict is judged insufficient to support the full subsistence need of the residents of the Nome Subdistrict. Tier II fishing rules will allow those residents determined to be the longest users and the most dependent users of the salmon to meet their harvest needs. The other salmon species present in the Nome Subdistrict during July are not present in sufficient numbers to provide for subsistence needs without also harvesting chum salmon. Chinook and sockeye salmon are very limited in number and although desirable as food, have always been caught incidentally to the chum salmon. Odd year pink salmon returns during the last ten years have been depressed to the point of barely providing adequate spawning stock while supporting virtually no harvest. Subsistence fishing for Tier II permit holders have had limited opportunity to harvest salmon in the marine waters this year. Weather conditions have been poor during some of the marine water openings. The scapement at the Eldorado River tower is at 5,000 chum salmon as of July 13, and the escapement goal range is 6,000 to 9,000 chum salmon. Projections of the chum run indicate that the run will at least meet the low end of the escapement goal, and the chum run is expected to be above the midpoint of the escapement goal range. Historically by this time over half of the chum run is by the counting tower. The Eldorado River and the Flambeau River meet and drain into Safety Sound. The Eldorado River tower is used as an index for the Flambeau River in addition to aerial surveys on both rivers. If aerial surveys are not practical because of poor weather then the tower counts at Eldorado are used as an index for the Flambeau River. If the Eldorado River is making its escapement goal then the Flambeau River will be considered to be making its escapement goal and vice versa. An early season survey, before counting began on the Eldorado River tower, observed approximately 1,100 chum salmon in the Eldorado River and 300 chum salmon in the Flambeau River.

Appendix G7. Emergency Orders issued during 2001.

Emergency Order Number	Effective Date	Action Taken	Comments
3 -S-Z-9-01	July 19, 2001	This emergency order opens the fresh waters west of the Safety Sound bridge and the Eldorado and Flambeau Rivers to Tier I subsistence fishing for 72 hours from 6:00 p.m. Thursday, July 19, 2001 until 6:00 p.m. Sunday, July 22, 2001.	Subsistence fishing for Tier II permit holders had opportunities to harvest salmon in the marine waters this year for three days a week since late June. Weather conditions have been poor during some of the marine water openings, but those who have fished have reported sufficient catches of chum salmon. There was a 48-hour Tier II opening on the Eldorado and Flambeau Rivers last week which further allowed opportunity for Tier II subsistence fishers. Those who participated reported catching their limit of chum salmon. The escapement at the Eldorado River tower is over 7,000 chum salmon as of July 17, and the escapement goal range is 6,000 to 9,000 chum salmon. Projections of the chum run indicate that the run will at least be above the midpoint and may surpass the high end of the escapement goal range. Historically by this time over 70% of the chum run is by the counting tower. The Eldorado River and the Flambeau River meet and drain into Safety Sound. The Eldorado River tower is used as an index for the Flambeau River in addition to aerial surveys on both rivers. If aerial surveys are not practical because of poor weather then the tower counts at Eldorado are used as an index for the Flambeau River. If the Eldorado River is making its escapement goal then the Flambeau River will be considered to be making its escapement goal and vice versa. An early season survey, before counting began on the Eldorado River tower, observed approximately 1,100 chum salmon in the Eldorado River and 300 chum salmon in the Flambeau River. This fishing period is scheduled to take advantage of the surplus of chum salmon available while they are still accessible to all subsistence fishers. Tier II permit holders can participate in this fishery as Tier I permit holders. There is also an exclusive Tier II chum salmon fishery occurring on a nearby river to provide further opportunity for the Tier II permit holders. The Tier I fishery will be a 72-hour fishing period west of the Safety Sound bridge and include the waters of the Eldorado and Flambeau Rivers. Set nets and beach seines will be permitted.
3 -S-Z-10-01	July 19, 2001	This emergency order opens the fresh waters of the Safety Sound, Bonanza Channel and the Bonanza River to Tier II subsistence fishing for 72 hours from 6:00 p.m. Thursday, July 19, 2001 until 6:00 p.m. Sunday, July 22, 2001.	Subsistence fishing for Tier II permit holders had opportunities to harvest salmon in the marine waters this year for three days a week since late June. Weather conditions have been poor during some of the marine water openings, but those who have fished have reported sufficient catches of chum salmon. The escapement at the Eldorado River tower is over 7,000 chum salmon as of July 17, and the escapement goal range is 6,000 to 9,000 chum salmon. Projections of the chum run indicate that the run will at least be above the midpoint and may surpass the high end of the escapement goal range. Historically by this time over 70% of the chum run is by the counting tower. The Eldorado River drains into Safety Sound and the Bonanza River drains into the Bonanza Channel which is connected to Safety Sound. Escapement of the Bonanza River has not been determined because poor flying conditions have prevented an accurate escapement estimate. In cases where there is not an escapement project on a river the Board of Fisheries has directed the department to use nearby escapement projects as an index. As the chum salmon escapement goal range has been met on the nearby Eldorado River the department believes the escapement goal range of 4,100 to 6,200 chum salmon is likely met on the Bonanza River. The department will survey the Bonanza River as soon as weather permits to verify the escapement goal range has been reached. This fishing period is scheduled to take advantage of the assumed surplus of chum salmon while they are accessible to Tier II subsistence fishers. Set nets and beach seines are permitted.

Appendix G7. Emergency Orders issued during 2001.

Emergency Order Number	Effective Date	Action Taken	Comments
3 -S-Z-11-01	July 22, 2001	This emergency order opens the fresh waters of the Sinuk River to Tier II subsistence salmon fishing for 72 hours from 6:00 p.m. Sunday, July 22, 2001 until 6:00 p.m. Wednesday, July 25, 2001.	Subsistence fishing for Tier II permit holders had opportunities to harvest salmon in the marine waters this year for three days a week since late June. Weather conditions have been poor during some of the marine water openings, but those who have fished have reported sufficient catches of chum salmon. There has also been Tier II fishing opportunities in fresh waters east of Cape Nome. To date most rivers west of Cape Nome have failed to meet escapement. Escapement projects on the Nome and Snake Rivers indicate that the low end of the escapement goal will not likely be met. Escapement of the Sinuk River had not been determined because poor flying conditions had prevented an accurate escapement estimate. In cases where there is not an escapement project on a river the Board of Fisheries has directed the department to use nearby escapement projects as an index. As the chum salmon escapement goal range had not been met on the nearby Nome and Snake Rivers the department believed the escapement goal range of 4,000 to 6,200 chum salmon was not likely met on the Sinuk River. The Board of Fisheries has set the escapement range at 4,000 to 6,200 chum salmon in the Sinuk River. The surveys of the Sinuk River on July 20 and July 21 indicate that the escapement goal range has likely been met. Therefore, there will be a 72-hour Tier II chum salmon beach seine and set gillnet fishing period in the Sinuk River from 6:00 p.m. Sunday, July 22, 2001 until 6:00 p.m. Wednesday, July 25, 2001. This fishing period is scheduled to take advantage of the assumed surplus of chum salmon while they are still accessible to Tier II subsistence fishers.
3 -S-Z-12-01	July 23, 2001	This emergency order opens the fresh waters west of the Safety Sound bridge and the Eldorado and Flambeau Rivers to Tier I subsistence fishing for 96 hours from 6:00 p.m. Monday, July 23, 2001 until 6:00 p.m. Wednesday, July 25, 2001 and from 6:00 p.m. Thursday, July 26, 2001 until 6:00 p.m. Saturday, July 28, 2001.	The escapement at the Eldorado River tower is over 7,000 chum salmon as of July 17, and the escapement goal range is 6,000 to 9,000 chum salmon. Projections of the chum run indicate that the run will at least be above the midpoint and may surpass the high end of the escapement goal range. Historically by this time over 80% of the chum run is by the counting tower. The Eldorado River and the Flambeau River meet and drain into Safety Sound. The Eldorado River tower is used as an index for the Flambeau River in addition to aerial surveys on both rivers. If aerial surveys are not practical because of poor weather then the tower counts at Eldorado are used as an index for the Flambeau River. If the Eldorado River is making its escapement goal then the Flambeau River will be considered to be making its escapement goal and vice versa. On July 20, with excellent conditions, an aerial survey of the Flambeau River observed 3,612 chum salmon and an aerial survey of the Eldorado River observed 4,450 chum salmon. The escapement goal range on the Flambeau River is 4,100 to 6,300 chum salmon. The escapement goal range for the Flambeau River is for total chum salmon on the grounds and is not an aerial survey index. An the aerial survey index does not provide a total count of all salmon in the river, but usually observes approximately 50 to 75% of the salmon there under excellent viewing conditions. The aerial survey index on the Flambeau River was 3,612 chum salmon and the escapement goal range is assumed to have been achieved. This fishing period is scheduled to take advantage of the surplus of chum salmon available while they are still accessible to all subsistence fishers. Tier II permit holders can participate in this fishery as Tier I permit holders. There is also an exclusive Tier II chum salmon fishery occurring in the marine waters outside of the Eldorado and Flambeau Rivers and other nearby rivers. Set nets and beach seines will be permitted.

Appendix G7. Emergency Orders issued during 2001.

Emergency Order Number	Effective Date	Action Taken	Comments
3 -S-Z-13-01	July 24, 2001	This emergency order opens the Nome Subdistrict in the marine waters from Cape Nome to Topkok Head to Tier II subsistence salmon fishing from 6:00 p.m. Tuesday, July 24, 2001 until 6:00 p.m. Saturday, July 28, 2001. Only Tier II permit holders will be allowed to subsistence fish for salmon in the marine waters from Cape Nome to Topkok Head.	Tier II openings have occurred in several streams since mid-July. Tier II permit holders are limited to 100 chum salmon each. The maximum limit that permit holders may take from one area is 50 chum salmon. If the permit holders wish to take 100 chum salmon they are required to spread their harvest over two or more locations so that fishing impacts will be spread over a broader area. Department staff will began issuing Tier II permits June 21 at the Nome Fish and Game Offices. Initially 20 Tier II permits were be issued. A person from each household awarded a permit was issued a permit form and was given an explanation of the fishing limits and rules. By mid-July few Tier II permit holders had participated in the fishery. Many Tier II permit holders said that they were waiting for fresh waters to open closer to Nome. As an opening in rivers closer to Nome was unlikely based on the escapement to date many Tier II permits were not being fished. As the harvestable surplus was projected to be greater than 2,000 chum salmon in the Eldorado River, 10 more Tier II permits were issued beginning on July 18. In addition, the nearby Flambeau River was believed to be meeting escapement and a Tier I period was allowed in the Eldorado and Flambeau Rivers. Later aerial surveys confirmed that the Flambeau River was also within the escapement goal range. To date half of the rivers east of Cape Nome in the Nome Subdistrict have met escapement. As the chum salmon run is now in the last quartile, fishing in marine waters by Tier II permit holders will allow those most dependent on the resource to harvest some chum salmon. The harvest in the marine waters is not expected to affect escapement noticeably.

Appendix G7. Emergency Orders issued during 2001.

Emergency Order Number	Effective Date	Action Taken	Comments
3 -S-Z-14-01	July 26, 2001	This emergency order opens the fresh waters of the Sinuk River to Tier I subsistence fishing for 48 hours from 6:00 p.m. Thursday, July 26, 2001 until 6:00 p.m. Saturday, July 28, 2001.	Subsistence fishing for Tier II permit holders had opportunities to harvest salmon in the marine waters this year for three days a week since late June. Weather conditions have been poor during some of the marine water openings, but those who have fished have reported sufficient catches of chum salmon. There have also been Tier II fishing opportunities in fresh waters east of Cape Nome and there was a 72-hour Tier II opening on the Sinuk River. To date most rivers west of Cape Nome have failed to meet escapement. Escapement projects on the Nome and Snake Rivers indicate that the low end of the escapement goal will not likely be met. Escapement of the Sinuk River had not been determined because poor flying conditions had prevented an accurate escapement estimate. In cases where there is not an escapement project on a river the Board of Fisheries has directed the department to use nearby escapement projects as an index. As the chum salmon escapement goal range had not been met on the nearby Nome and Snake Rivers the department believed the escapement goal range of 4,000 to 6,200 chum salmon was not likely met on the Sinuk River. An aerial survey of the Sinuk River on July 20 observed 1,620 sockeye salmon in Glacial Lake (a lake that drains into the Sinuk River) and 3,746 salmon, the majority of which were believed to be chum salmon, in the Sinuk River. Another survey the following day using a helicopter allowed more accurate speciation observed 1,340 sockeye salmon in Glacial Lake and 2,890 chum salmon and 115 pink salmon in the Sinuk River. The fewer salmon observed with the helicopter was attributed to poorer weather conditions. The Board of Fisheries has set the escapement range at 4,000 to 6,200 chum salmon in the Sinuk River. Aerial surveys do not observe all the salmon in the drainage, but surveys are used as an index of abundance. The surveys of the Sinuk River on July 20 and July 21 indicate that the escapement goal range has likely been met. Therefore, there will be a 48-hour Tier I chum salmon beach seine and set gillnet fishing period in the Sinuk River from 6:00 p.m. Thursday, July 26, 2001 until 6:00 p.m. Thursday, July 28, 2001. This fishing period is scheduled to take advantage of the surplus of chum salmon available while they are still accessible to all subsistence fishers. Tier II permit holders can participate in this fishery as Tier I permit holders. There is also an exclusive Tier II chum salmon fishery occurring in the marine waters from Cape Nome to Topkok Head and other nearby rivers. Set nets and beach seines will be permitted.
3 -S-Z-15-01	July 27, 2001	This emergency order opens Norton Sound Subdistricts 5 and 6 to commercial salmon fishing for one 24-hour period. The fishing period will run from 6:00 p.m. Friday, July 27, 2001 until 6:00 p.m. Saturday, July 28, 2001, with gillnets restricted to 6 inches or smaller mesh size.	Based on North River Tower counts and the department test net in the Unalakleet River, coho salmon are starting to appear in the near shore waters of eastern Norton Sound with increasing numbers entering the Unalakleet River this past week. Tower counts and test net catches of coho salmon indicate that the run is not as strong as the year 2000 coho run but similar to runs of 1997 through 1999. This opening is intended to test the abundance of coho salmon in the waters of eastern Norton Sound. Therefore, this period will be limited to reduce fishing time as a conservation measure and to follow the precedence of test openings in prior years. Gillnet mesh size will be restricted to 6-inch or smaller mesh size. The department will consider escapement, subsistence use, and commercial fishing results before scheduling additional periods.

Appendix G7. Emergency Orders issued during 2001.

Emergency Order Number	Effective Date	Action Taken	Comments
3 -S-Z-16-01	July 30, 2001	This emergency order opens the Nome Subdistrict in the marine waters from Cape Nome to Topkok Head to Tier II subsistence salmon fishing from 6:00 p.m. Monday, July 30, 2001 until 6:00 p.m. Saturday, August 4, 2001. Only Tier II permit holders will be allowed to subsistence fish for salmon in the marine waters from Cape Nome to Topkok Head.	For the past decade the chum salmon fisheries of the Nome Subdistrict have been weak. Although limited rebuilding has occurred the chum salmon returns are far weaker than those prior to 1987. Once again, the waters of the Nome Subdistrict are being closed to provide chum salmon spawning stock. The chum salmon stock of the Nome Subdistrict is judged insufficient to support the full subsistence need of the residents of the Nome Subdistrict. Tier II fishing rules will allow those residents determined to be the longest users and the most dependent users of the salmon to meet their harvest needs. The other salmon species present in the Nome Subdistrict during July are not present in sufficient numbers to provide for subsistence needs without also harvesting chum salmon. Chinook and sockeye salmon are very limited in number and although desirable as food, have always been caught incidentally to the chum salmon. Odd year pink salmon returns during the last ten years have been depressed to the point of barely providing adequate spawning stock while supporting virtually no harvest. The Tier I closure of these other salmon species is necessary for both conservation and to allow the orderly management of the Tier II fishery. Tier II openings have occurred in several streams since mid-July. Tier II permit holders are limited to 100 chum salmon each. The maximum limit that permit holders may take from one area is 50 chum salmon. If the permit holders wish to take 100 chum salmon they are required to spread their harvest over two or more locations so that fishing impacts will be spread over a broader area.
3 -S-Z-17-01	July 30, 2001	This emergency order opens the fresh waters of the Eldorado, Flambeau and Sinuk Rivers to Tier I subsistence fishing for two 48-hour fishing periods. Subsistence fishing will be permitted from 6:00 p.m. Monday, July 30, 2001 until 6:00 p.m. Wednesday, August 1, 2001, and from 6:00 p.m. Thursday, August 2, 2001 until 6:00 p.m. Saturday, August 4, 2001.	The fishing period in fresh waters is scheduled to take advantage of the surplus of chum salmon available while they are still accessible to all subsistence fishers. Tier II permit holders can participate in this fishery as Tier I permit holders. There is also an exclusive Tier II chum salmon fishery occurring in the marine waters from Cape Nome to Topkok Head and other nearby rivers. Set nets and beach seines will be permitted.
3 -S-Z-18-01	July 30, 2001	This emergency order opens Norton Sound Subdistricts 5 and 6 to commercial salmon fishing for one 24-hour period. The fishing period will run from 6:00 p.m. Monday, July 30, 2001 until 6:00 p.m. Tuesday, July 31, 2001, with gillnets restricted to 6 inches or smaller mesh size.	Based on North River Tower counts and the department test net in the Unalakleet River, coho salmon are starting to appear in the near shore waters of eastern Norton Sound with increasing numbers entering the Unalakleet River this past week. Tower counts and test net catches of coho salmon indicate that the run is not as strong as the year 2000 coho run but similar to runs of 1997 through 1999. The first 24-hour commercial opening had a catch of 532 coho salmon, 267 chum salmon and 2 king salmon for 12 permit holders in the Unalakleet Subdistrict. In the Shaktoolik Subdistrict only one permit holder fished and caught 6 coho salmon and 40 chum salmon. Participation in both subdistricts was reduced because of poor weather. The catches and CPUE were slightly below average for this time period and may have been the result of the poor weather. As in the first cohort and this period will also be limited to reduce fishing time as a conserv measure. Gillnet mesh size will be restricted to 6-inch or smaller mesh size.

Appendix G7. Emergency Orders issued during 2001.

Emergency Order Number	Effective Date	Action Taken	Comments
3 -S-Z-19-01	August 2, 2001	<p>This emergency order restores all subsistence fishing in the Nome Subdistrict to standard fishing periods and harvest areas beginning August 2 for both Tier I and Tier II fishers. All marine waters of the Nome Subdistrict are open to gillnet fishing with no mesh size restrictions. The standard weekly fishing schedule in the marine waters is from 6 p.m. Mondays until 6 p.m. Saturdays. All freshwaters of the Nome Subdistrict are opened to gillnet and beach seine fishing below boundary markers on each river. The upstream limit on the Nome River has been reduced to approximately one mile below the Fish & Game weir. The standard weekly fishing schedule in fresh waters is from 6 p.m. Mondays to 6 p.m. Wednesdays and from 6 p.m. Thursdays to 6 p.m. Saturdays. Chum and pink salmon caught in the Nome River must be immediately returned to the water.</p>	<p>The chum salmon migration into the streams of the Nome Subdistrict is essentially over. In the Nome Subdistrict, beginning August 2nd, Tier I and Tier II subsistence fishing will be restored to the standard fishing periods and harvest areas throughout the subdistrict, except for the Nome River. In the Nome River the subsistence harvest area will be from 200 yards upstream of the Nome River mouth to the VOR site, approximately one-mile above the Nome River Bridge. No subsistence fishing will be allowed upstream of the VOR site. For subsistence fishing gear in the Nome River only beach seines and rod and reel will be legal gear, and all chum salmon and pink salmon captured must be returned immediately to the water. The chum and pink salmon escapement at the Nome River weir is well below the escapement goal. Through July 30, the weir has passed 1,900 chum salmon and 465 pink salmon. The minimum escapement goal at the Nome River weir is 2,900 chum salmon and 13,000 pink salmon. Historically, in an odd-numbered year the midpoint of the pink salmon run past the weir is August 1st. For chum salmon usually over 85% of the run has passed the weir by August 1st. Because neither chum nor pink salmon are likely to meet their escapement goals, fishing restrictions are necessary to allow as many chum and pink salmon to spawn as possible. Coho salmon are beginning to appear in local waters and the fishing schedule will allow an opportunity to harvest cohos in both the marine and fresh waters of the Nome Subdistrict. Fishers are reminded that the harvest limits are 20 cohos in marine waters and most streams in the Nome Subdistrict have a limit of 20 cohos. Subsistence fishers need to pick up a subsistence permit at the Fish & Game office if they have not picked one up yet.</p>
3 -S-Z-20-01	August 2, 2001	<p>This emergency order opens Norton Sound Subdistricts 5 and 6 to commercial salmon fishing for one 24-hour period. The fishing period will run from 6:00 p.m. Thursday, August 2, 2001 until 6:00 p.m. Friday, August 3, 2001, with gillnets restricted to 6 inches or smaller mesh size.</p>	<p>Based on North River Tower counts and the department test net in the Unalakleet River, coho salmon are starting to appear in the nearshore waters of eastern Norton Sound with increasing numbers entering the Unalakleet River. Tower counts and test net catches of coho salmon indicate that the run is weaker than the year 2000 coho run. The commercial harvest for the 24-hour opening on Monday was 302 coho and 80 chum salmon for 10 fishers in the Unalakleet Subdistrict and 116 coho and 30 chum salmon for 6 fishers in the Shaktoolik Subdistrict. Fishing effort and catch were below average for this date. The Unalakleet test net catches have been below average to date. Because of the uncertainty of the strength of this years coho run and the below average catch index in the test net and the commercial fishery the department will stay with the reduced commercial fishing schedule. Gillnet mesh size will be restricted to 6-inch or smaller mesh size. The department will consider escapement, subsistence use, and commercial fishing results before scheduling additional periods. Commercial fishers are reminded that any unsold salmon caught in commercial gear and kept must be reported on their fish tickets.</p>

Appendix G7. Emergency Orders issued during 2001.

Emergency Order Number	Effective Date	Action Taken	Comments
3 -S-Z-21-01	August 6, 2001	This emergency order opens Norton Sound Subdistricts 5 and 6 to commercial salmon fishing for one 24-hour period. The fishing period will run from 6:00 p.m. Monday, August 6, 2001 until 6:00 p.m. Tuesday, August 7, 2001, with gillnets restricted to 6 inches or smaller mesh size.	The commercial harvest for the 24-hour opening on Thursday, August 2, was 487 coho and 82 chum salmon for 9 fishers in the Unalakleet Subdistrict and 243 coho and 63 chum salmon for 7 fishers in the Shaktoolik Subdistrict. Fishing effort and catch were well below average for this date. The CPUE, which is the catch per unit of effort, has also been below average to date. The CPUE is a measure of the number of fish caught per hour by the fisher. With shorter periods and fewer permits being fished the CPUE should be better than average in a normal strength run. The Unalakleet test net catches have been about 25% below average to date. The department has concerns that this year's coho run is weak. The parent-year of this year's coho run was 1997 and that run was weak as was the following odd-numbered year coho run in 1999. Early indications are that 2001 coho run is weak also. Because of below average catch indexes in both the test net and the commercial fishery the department will stay with the reduced commercial fishing schedule. Historically, the second week of August has produced some of the peak catches of the coho season and catches in the commercial fishery should help to determine if this run is weak or late. If catches continue to be weak additional restrictions may be necessary in the future. However, with the small fishing effort to date and the reduced fishing schedule the commercial harvest should not affect subsistence needs or escapement from being met. Gillnet mesh size will be restricted to 6-inch or smaller mesh size. The department will consider escapement, subsistence use, and commercial fishing results before scheduling additional periods.
3 -S-Z-22-01	August 7, 2001	This emergency order opens Norton Sound Subdistricts 5 and 6 to commercial salmon fishing for one 24-hour extension. The fishing period will run from 6:00 p.m. Tuesday, August 7, 2001 until 6:00 p.m. Wednesday, August 8, 2001, with gillnets restricted to 6 inches or smaller mesh size.	The department has concerns that this year's coho run is weak. The parent-year of this year's coho run was 1997 and that run was weak as was the following odd-numbered year coho run in 1999. Early indications are that 2001 coho run is weak also. Because of below average catch indexes in both the test net and the commercial fishery the department will stay with the reduced commercial fishing schedule. Historically, the second week of August has produced some of the peak catches of the coho season and catches in the commercial fishery should help to determine if this run is weak or late. If catches continue to be weak additional restrictions may be necessary in the future. However, with the small fishing effort to date and the reduced fishing schedule the commercial harvest should not affect subsistence needs or escapement from being met. Gillnet mesh size will be restricted to 6-inch or smaller mesh size. The department will consider escapement, subsistence use, and commercial fishing results before scheduling additional periods.
3 -S-Z-23-01	August 9, 2001	This emergency order opens Norton Sound Subdistricts 5 and 6 to commercial salmon fishing for one 24-hour period. The fishing period will run from 6:00 p.m. Thursday, August 9, 2001 until 6:00 p.m. Friday, August 10, 2001, with gillnets restricted to 6 inches or smaller mesh size.	The department has concerns that this year's coho run is weak. The parent-year of this year's coho run was 1997 and that run was weak as was the following odd-numbered year coho run in 1999. Early indications are that 2001 coho run is weak also. Because of below average catch indexes in both the test net and the commercial fishery the department will stay with the reduced commercial fishing schedule. Historically, the second week of August has produced some of the peak catches of the coho season and catches in the commercial fishery should help to determine if this run is weak or late. If catches continue to be weak additional restrictions may be necessary in the future. However, with the small fishing effort to date and the reduced fishing schedule the commercial harvest should not affect subsistence needs or escapement from being met. Gillnet mesh size will be restricted to 6-inch or smaller mesh size.

Appendix G7. Emergency Orders issued during 2001.

Emergency Order Number	Effective Date	Action Taken	Comments
3 -S-Z-24-01	August 13, 2001	This emergency order opens Norton Sound Subdistricts 2, 5 and 6 to commercial salmon fishing for one 48-hour period. The fishing period will run from 6:00 p.m. Monday, August 13, 2001 until 6:00 p.m. Wednesday, August 15, 2001, with gillnets restricted to 6 inches or smaller mesh size.	The catches to date in the Shaktoolik Subdistrict have been less than 1,000 cohos. This is a result of low fishing effort, less fishing time this season and poor weather. Catches in the commercial fishery this past week in the Unalakleet Subdistrict indicated that the main portion of the run had arrived. Given the low effort in the commercial fishery the catches were determined to be average. Escapement counts doubled at the North River tower last Thursday and now the coho escapement is over 4,000 fish making it one of the better escapements to date. The commercial fishery had been restricted to 24-hour periods to allow for greater escapement. One commercial period was extended to 48 hours because of weather. As the escapement into the Unalakleet River has recently improved the department believes that a 48-hour period is justified. With the small fishing effort to date and the improved escapement the commercial harvest should not affect subsistence needs or escapement from being met. In the Golovin Subdistrict the commercial fishery was delayed until counts past the Niukluk River tower improved. Using the commercial catches of Unalakleet and Shaktoolik Subdistricts as an indicator as well as the tower and weir counts in the Nome Subdistrict the coho run was thought to be late. In order to protect escapement and subsistence users the department did not open last week in Golovin. With improved escapement counts at the Niukluk tower a 48-hour commercial period in the Golovin Subdistrict will allow economic opportunity without jeopardizing escapement or subsistence needs. The commercial fishing effort is expected to be low and the CPUE from the commercial fishery will further help to determine the strength of the coho salmon run. Gillnet mesh size will be restricted to 6-inch or smaller mesh size in all subdistricts. The department will consider escapement, subsistence use, and commercial fishing results before scheduling additional periods.
3 -S-Z-25-01	August 16, 2001	This emergency order opens Norton Sound Subdistricts 2, 5 and 6 to commercial salmon fishing for one 48-hour period and Norton Sound Subdistrict 3 for one 24-hour period. The fishing period in Subdistricts 2, 5 and 6 will be open from 6:00 p.m. Thursday, August 16, 2001 until 6:00 p.m. Saturday, August 18, 2001. The fishing period in Subdistrict 3 will be open from 6:00 p.m. Thursday, August 16, 2001 until 6:00 p.m. Friday, August 17, 2001. Gillnets are restricted to 6 inches or smaller mesh size in all Subdistricts.	The commercial fishery had been restricted to 24-hour periods to allow for greater escapement in the early portion of the run. One commercial period was extended to 48 hours because of weather. As the escapement into the Unalakleet River has improved as indicated by the test net the normal two 48-hour periods will be allowed this week. With the small fishing effort to date and the improved escapement the commercial harvest should not affect subsistence needs or escapement from being met. In the Golovin Subdistrict the commercial fishery was delayed until counts past the Niukluk River tower improved. Using the commercial catches of Unalakleet and Shaktoolik Subdistricts as an indicator as well as the tower and weir counts in the Nome Subdistrict the coho run was thought to be late. In order to protect escapement and subsistence users the department did not open last week in Golovin. The recent 48-hour opening had only one fisher and the catch was 25 cohos. The commercial fishing effort is again expected to be low and the CPUE from the commercial fishery will further help to determine the strength of the coho salmon run. An additional 48-hour commercial period in the Golovin Subdistrict will allow economic opportunity without jeopardizing escapement or subsistence needs. The commercial fishing effort is again expected to be low and the CPUE from the commercial fishery will further help to determine the strength of the coho salmon run. In the Moses Point Subdistrict the commercial fishery was also delayed until counts past the Kwiniuk River tower improved. The department was planning to open the Subdistrict earlier in the week, but the buyer was unable to provide a tender so the fishery remained closed. The coho escapement has increased, and 1,500 cohos are now past the tower. This is the first year the tower has counted this late in to August so no comparisons can be made with previous years.

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Emergency Order Number	Effective Date	Action Taken	Comments
3 -S-Z-26-01	August 20, 2001	This emergency order opens Norton Sound Subdistricts 2, 5 and 6 to commercial salmon fishing for one 48-hour period and Norton Sound Subdistrict 3 for one 24-hour period. The fishing period in Subdistricts 2, 5 and 6 will be open from 6:00 p.m., August 20, 2001 until 6:00 p.m., August 22, 2001. The fishing period in Subdistrict 3 will be open from 6:00 p.m., August 21, 2001 until 6:00 p.m., August 22, 2001. Gillnets are restricted to 6 inches or smaller mesh size in all Subdistricts.	Gillnet mesh size will be restricted to 6-inch or smaller mesh size in all subdistricts. The department will consider escapement, subsistence use, and commercial fishing results before scheduling additional periods. Commercial fishers are reminded that any unsold salmon caught in commercial gear and kept must be reported on their fish tickets.
3 -S-Z-27-01	August 20, 2001	This emergency order closes all subsistence fishing in the Nome Subdistrict beginning August 20 for both Tier I and Tier II fishers. Subsistence fishing in the Nome Subdistrict will now be opened by emergency order only. This emergency order reopens subsistence fishing in the marine waters of the Nome Subdistrict to one 48-hour period from 6 p.m. Monday, August 20, 2001 until 6 p.m. Wednesday, August 22, 2001. All freshwaters of the Nome Subdistrict are reopened to subsistence fishing below boundary markers on each river from 6 p.m. Monday, August 20, 2001 until 6 p.m. Tuesday, August 21, 2001. The upstream limit on the Nome River has been reduced to approximately one mile below the Fish & Game weir, and beach seines and rod & reel will be the only legal gear in the Nome River. Chum and pink salmon caught in the Nome River must be immediately returned to the water.	Coho salmon escapement indices on the southern Seward Peninsula indicate weak returns. Almost all coho salmon are four-year-old fish and weak returns tend to perpetuate from generation to generation. The parent-year of the 2001 return was weak and a pattern has developed for weak returns in odd-numbered years. A severely weakened broad year could remain weak for several generations. In addition to that problem, there has been low survival of coho salmon in recent years in western Alaska. Any gains in return strength must be accomplished within the year class of the poor return. The standard fishing schedule of 7 days per week in marine waters and 4 days per week in fresh water harvest areas needs to be restricted. Escapement at the Nome River weir is tracking slightly above the weak returns in 1997 and 1999. At the Snake River tower the escapement is tracking behind 1997 returns, but ahead of 1999 returns. The Eldorado River tower escapement is behind 1997 returns, but ahead of 1999 returns. In both 1997 and 1999 subsistence salmon fishing was closed in mid-August. No coho escapement goals have been established for rivers in the Nome Subdistrict because there are not enough years of reliable data. The department will allow some subsistence salmon fishing on a reduced schedule this week and will reevaluate if a closure is warranted later in the week. The chum and pink salmon escapement at the Nome River weir is well below the escapement goal. Through August 20, the weir has passed 2,722 chum salmon and 3,008 pink salmon. The minimum escapement goal at the Nome River weir is 2,900 chum salmon and 13,000 pink salmon. The chum and pink salmon run is essentially over, but some chum salmon and pink salmon will continue to pass through the weir for the next few weeks. Because neither chum nor pink salmon are likely to meet their escapement goals, fishing restrictions are necessary to allow as many chum and pink salmon to spawn as possible. In the Nome River the subsistence harvest area will be from 200 yards upstream of the Nome River mouth to the VOR site, approximately one-mile above the Nome River Bridge. No subsistence fishing will be allowed upstream of the VOR site. For subsistence fishing gear in the Nome River only beach seines and rod and reel will be legal gear, and all chum and pink salmon captured must be returned immediately to the water.

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Emergency Order Number	Effective Date	Action Taken	Comments
3 -S-Z-28-01	August 23, 2001	Subsistence fishing in the Nome Subdistrict was closed in Emergency Order 3-S-Z-27-01 and is now reopened to one 48-hour period in marine waters of the Nome Subdistrict from 6 p.m. Thursday, August 23, 2001 until 6 p.m. Saturday, August 25, 2001. In addition, all freshwaters of the Nome Subdistrict except for the Nome River are reopened to subsistence fishing below boundary markers on each river for one 24-hour period from 6 p.m. Friday, August 24, 2001 until 6 p.m. Saturday, August 25, 2001. The Nome River is closed to all subsistence salmon fishing.	Coho salmon escapement indices on the southern Seward Peninsula indicate weak returns. Almost all coho salmon are four-year-old fish and weak returns tend to perpetuate from generation to generation. The parent-year of the 2001 return was weak and a pattern has developed for weak returns in odd-numbered years. A severely weakened brood year could remain weak for several generations. In addition to that problem, there has been low survival of coho salmon in recent years in western Alaska. Any gains in return strength must be accomplished within the year class of the poor return. The standard fishing schedule of 7 days per week in marine waters and 4 days per week in fresh water harvest areas needs to be restricted. Escapement at the Nome River weir has fallen behind all previous escapements by this date in the last seven years. Through August 22 the escapement at Nome weir is 251 cohos and in 1997 and 1999, when subsistence salmon fishing was closed in mid-August, coho escapement through August 22 was 271 and 331 cohos respectively. Because of the poor returns to the Nome River it is necessary to close that river to further salmon fishing to protect all returning coho salmon. At the Snake River tower the escapement is tracking behind 1997 returns, but is ahead of coho escapements the last few years. The Eldorado River tower escapement is also behind 1997 returns, but ahead of the last two year's escapement. In both 1997 and 1999 subsistence salmon fishing was closed in mid-August. No coho escapement goals have been established for rivers in the Nome Subdistrict because there are not enough years of reliable data. The department will allow some subsistence salmon fishing on a reduced schedule this week and will reevaluate if a closure is warranted next week.
3 -S-Z-29-01	August 23, 2001	This emergency order opens Norton Sound Subdistricts 3, 5 and 6 to commercial salmon fishing for one 48-hour period from 6:00 p.m. Thursday, August 23, 2001 until 6:00 p.m. Saturday, August 25, 2001. Gillnets are restricted to 6 inches or smaller mesh size in all subdistricts.	The crew at the North River tower has resumed counting after high water suspended counting for several days. The escapement is estimated at over 6,000 cohos, making it one of the better escapements to date. The Unalakleet test fish net has begun to fall behind the average range. If catches in the test net continue below average the department will restrict the commercial fishery. The commercial fishery had been restricted to 24-hour periods to allow for greater escapement in the early portion of the run. With the small fishing effort to date another 48-hour commercial fishing period should not affect subsistence needs or escapement from being met. In the Moses Point Subdistrict the commercial fishery was also delayed until counts past the Kwiniuk River tower improved. The department was planning to open the Subdistrict earlier in the week, but the buyer was unable to provide a tender so the fishery remained closed. The coho escapement has continued to improve steadily and 3,600 cohos are now past the Kwiniuk River tower. This is the first year the tower has counted this late in August so no comparisons can be made with previous years, but the department is confident that the escapement on the Kwiniuk River is strong when compared to nearby rivers that have had projects that count in to September. The restriction of a 24-hour period in Moses Point is relaxed to a 48-hour period for the reasons of good escapement and the inability of the fishers to fish previously because of weather and processor limitations. Gillnet mesh size will be restricted to 6-inch or smaller mesh size in all subdistricts. The department will consider escapement, subsistence use, and commercial fishing results before scheduling additional periods. Commercial fishers are reminded that any unsold salmon caught in commercial gear and kept must be reported on their fish tickets.

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Emergency Order Number	Effective Date	Action Taken	Comments
3 -S-Z-30-01	August 27, 2001	This emergency order opens Norton Sound Subdistricts 5 and 6 to commercial salmon fishing for one 24-hour period from 6:00 p.m. Monday, August 27, 2001 until 6:00 p.m. Tuesday, August 28, 2001. Gillnets are restricted to 6 inches or smaller mesh size in all subdistricts.	The cumulative catch in the Unalakleet Subdistrict is 14,700 cohos and in the Shaktoolik Subdistrict the cumulative catch is 2,500 cohos. The lower catches in Shaktoolik this season have been a result of lower fishing effort and less fishing time because of poor weather. The crew at the North River tower has resumed counting after high water suspended counting for several days. The escapement is estimated at over 6,000 cohos, making it one of the better escapements to date. The Unalakleet test fish net has continued to fall further behind the average range indicating that the later portion of the run is weak. The commercial fishery initially had been restricted to 24-hour periods to allow for greater escapement in the early portion of the coho run. One commercial period was extended to 48 hours because of weather. As the escapement into the Unalakleet River improved as indicated by the test net the normal two 48-hour periods per week were allowed last two weeks. However, last week the test net began to fall behind average and that trend has continued. Even with a low fishing effort to date the CPUE has fallen below average. The department will now restrict fishing time. With the low fishing effort a 24-hour commercial fishing period should not affect subsistence needs or escapement from being met. If the CPUE does not improve then the department will consider closing the commercial season. Gillnet mesh size will be restricted to 6-inch or smaller mesh size in all subdistricts. The department will consider escapement, subsistence use, and commercial fishing results before scheduling additional periods. Commercial fishers are reminded that any unsold salmon caught in commercial gear and kept must be reported on their fish tickets.
3 -S-Z-31-01	August 27, 2001	Subsistence fishing is now reopened to two 48-hour periods in marine waters of the Nome Subdistrict from 6 p.m., August 27, 2001 until 6 p.m., August 29, 2001 and from 6 p.m., August 30, 2001 until 6 p.m., September 1, 2001. In addition, all freshwaters of the Nome Subdistrict are reopened to subsistence fishing below boundary markers on each river for two 24-hour periods from 6 p.m. Monday, August 27 until 6:00 p.m. Tuesday, August 28, 2001, and from 6:00 p.m. Friday, August 31, 2001 until 6 p.m. Saturday, September 1, 2001. The Nome River will reopen to subsistence fishing on the fresh water schedule and the harvest area will be restricted to downstream of the regulatory markers at the VOR site to the markers 200 yards upstream of the mouth.	Coho salmon escapement indices on the southern Seward Peninsula indicate weak returns. Almost all coho salmon are four-year-old fish and weak returns tend to perpetuate from generation to generation. The parent-year of the 2001 return was weak and a pattern has developed for weak returns in odd-numbered years. Any gains in return strength must be accomplished within the year-class of the poor return. The standard fishing schedule of 7 days per week in marine waters and 4 days per week in fresh water harvest areas needs to be restricted. Escapement at the Nome River weir has improved in the last several days and is well above the weak returns in 1997 and 1999. At the Snake River tower the escapement is tracking behind 1997 returns, but ahead of 1999 returns. The Eldorado River tower escapement is behind 1997 returns, but ahead of 1999 returns. In both 1997 and 1999 subsistence salmon fishing was closed in mid-August. The department will allow subsistence salmon fishing on a reduced schedule this week and will reevaluate later in the week. The chum and pink salmon escapement at the Nome River weir is well below the escapement goal. Through August 26, the weir has passed 2,789 chum salmon and 3,008 pink salmon. The minimum escapement goal at the Nome River weir is 2,900 chum salmon and 13,000 pink salmon. The chum and pink salmon run is essentially over, but some chum salmon and pink salmon will continue to pass through the weir for the next two weeks. Because neither chum nor pink salmon are likely to meet their escapement goals, fishing restrictions are necessary to allow as many chum and pink salmon to spawn as possible. In the Nome River the subsistence harvest area will be from 200 yards upstream of the Nome River mouth to the VOR site, approximately one-mile above the Nome River Bridge. No subsistence fishing will be allowed upstream of the VOR site. For subsistence fishing gear in the Nome River only beach seines and rod and reel will be legal gear, and all chum and pink salmon captured must be returned immediately to the water.

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Emergency Order Number	Effective Date	Action Taken	Comments
3 -S-Z-32-01	August 30, 2001	This emergency order closes Norton Sound Subdistricts 5 and 6 to commercial salmon fishing for the remainder of the commercial season.	The commercial harvest for the 24-hour opening beginning on Monday, August 27, was 515 coho salmon for 13 fishers in the Unalakleet Subdistrict, and 180 coho for 2 fishers in the Shaktoolik Subdistrict. The catch and CPUE were below average in both Subdistricts. The low catches and CPUE compared to previous years have continued for over a week. The only time the CPUE went above average was in the second week of August. Because there has been much fewer permit holders fishing than usual the CPUE would likely be above average if the run was at normal strength. Coho salmon runs have been below average for the majority of Norton Sound. The hope for a late return of coho salmon is now past. The Unalakleet test net is tracking 25% below average and has been dropping farther behind. Typically only 5% of the commercial salmon catch is still to be harvested. This closure is intended to allow those remaining salmon to make their way into the rivers so that most will spawn and help to make up for the reduced escapements now in the rivers of Eastern Norton Sound.
3 -S-Z-33-01	September 1, 2001	Subsistence fishing in the Nome Subdistrict will open to the normal seven days per week fishing schedule in the marine waters, but will be restricted in fresh waters to two 24-hour periods per week. Subsistence fishing in fresh waters will be open from 6 p.m. Monday until 6 p.m. Tuesday and from 6 p.m. Friday until 6 p.m. Saturday. The Nome River harvest area will be restricted to downstream of the regulatory markers at the VOR site to the markers 200 yards upstream of the mouth.	Coho salmon escapement indices on the southern Seward Peninsula indicate weak returns. Almost all coho salmon are four-year-old fish and weak returns tend to perpetuate from generation to generation. The parent-year of the 2001 return was weak and a pattern has developed for weak returns in odd-numbered years. A severely weakened broad year could remain weak for several generations. In addition to that problem, there has been low survival of coho salmon in recent years in western Alaska. Any gains in return strength must be accomplished within the year class of the poor return. The standard fishing schedule of 7 days per week in marine waters and 4 days per week in fresh water harvest areas needs to be restricted. Escapement at the Nome River weir has improved in the last several days and is well above the weak returns in 1997 and 1999. At the Snake River tower the escapement is tracking behind 1997 returns, but ahead of 1999 returns. The Eldorado River tower escapement is behind 1997 returns, but ahead of 1999 returns. In both 1997 and 1999 subsistence salmon fishing was closed in mid-August. No coho escapement goals have been established for rivers in the Nome Subdistrict because there are not enough years of reliable data. The department will allow subsistence salmon fishing on a reduced schedule this week and will reevaluate the fishery later in the week based in escapement at the counting projects and aerial surveys. The chum and pink salmon escapement at the Nome River weir is well below the escapement goal. Through August 26, the weir has passed 2,789 chum salmon and 3,008 pink salmon. The minimum escapement goal at the Nome River weir is 2,900 chum salmon and 13,000 pink salmon. The chum and pink salmon run is essentially over, but some chum salmon and pink salmon will continue to pass through the weir for the next two weeks. Because neither chum nor pink salmon are likely to meet their escapement goals, fishing restrictions are necessary to allow as many chum and pink salmon to spawn as possible. In the Nome River the subsistence harvest area will be from 200 yards upstream of the Nome River mouth to the VOR site, approximately one-mile above the Nome River Bridge. No subsistence fishing will be allowed upstream of the VOR site. For subsistence fishing gear in the Nome River only beach seines and rod and reel will be legal gear, and all chum salmon and pink salmon captured must be returned immediately to the water.

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Emergency Order Number	Effective Date	Action Taken	Comments
3-S-X-01-01	July 10, 2001	This emergency order opens commercial salmon fishing in the Kotzebue District to 4 twelve hour periods beginning Tuesday, July 10 at 6 a.m. Fishing periods will run from 6 a.m. to 6 p.m. on Tuesday, Wednesday, Thursday, and end Friday, July 13.	In keeping with the management plan published prior to the season, the commercial fishery will open July 10. This is a series of test openings to determine salmon abundance, fishing effort, and fish buyer capabilities. Two buyers are registered and both have a concern for their ability to effectively transport fish out of Kotzebue to potential markets. This series of more frequent short openings was successful last year at improving fish quality and reducing the risk of salmon not making it to market by keeping daily volumes low. Reported subsistence salmon catches indicate chum salmon have been moving for nearly a week and there is a chance some sheefish may be caught incidental to the commercial salmon fishery. In the event the catch of sheefish is high, fishing may be closed or moved away from sheefish hotspots in order to protect the sheefish subsistence resource until they migrate out of the area. The most reliable index of chum salmon run strength is the commercial catch rate. Management using comparisons of catch rate trends will need to be modified for relevance with the shorter, more frequent openings. Age composition, test fisheries, and subsistence reports will be factors in management decisions as periods are shortened. With an average return expected, a limited market and a reduced number of participating fishers, achieving escapement goals is not expected to be a problem.
194 3-S-X-02-01	July 16, 2001	This emergency order opens commercial salmon fishing in the Kotzebue District to 4 twelve hour periods beginning Monday, July 16 at 6 a.m. Fishing periods will run from 6 a.m. to 6 p.m. on Monday, Tuesday, Thursday, and end Friday, July 20.	Two buyers are registered and both have a concern for their ability to effectively transport fish out of Kotzebue to potential markets. This series of more frequent short openings was successful last year at improving fish quality and reducing the risk of salmon not making it to market by keeping daily volumes low. Participation in the commercial fishery increased later in the week as more fishers were encouraged by reports of good fishing. The catch of approximately 15,000 chum salmon the first week was above average. The most reliable index of chum salmon run strength is the commercial catch rate. Management using comparisons of catch rate trends will need to be modified for relevance with the shorter, more frequent openings. Age composition, test fisheries, and subsistence reports will be factors in management decisions as periods are shortened. The first few weeks of the Kotzebue Sound commercial fishery the catch is predominately Kobuk River stocks. The department test net on the Kobuk River has been indexing escapement passage at Kiana since 1993. To date the catch is tracking above average. Residents on the Kobuk River have reported that their subsistence needs are being met.
3-S-X-03-01	July 18, 2001	This emergency order opens commercial salmon fishing in the Kotzebue District to 1 twelve hour period beginning Wednesday, July 18 at 6 a.m. and ending at 6 p.m.	The return to the Kobuk River remains strong with the Kobuk test fish project catch indices well above average. This along with light effort and pore weather today Tuesday July 17 allow for an additional fishing period. The department is still concerned about the return of 4-year-old chum salmon. The percentage of 4-year-olds should start to increase over the next two weeks. This period will allow the harvest of the more abundant 5-year-old chum salmon. The first few weeks of the Kotzebue Sound commercial fishery the catch is predominately Kobuk River stocks. The department test net on the Kobuk River has been indexing escapement passage at Kiana since 1993. To date the catch is tracking above average. Residents on the Kobuk River have reported that their subsistence needs are being met. With an average return expected, a limited market and a reduced number of participating fishermen, achieving escapement goals is not expected to be a problem.

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Emergency Order Number	Effective Date	Action Taken	Comments
3-S-X-04-01	July 23, 2001	This emergency order opens commercial salmon fishing in the Kotzebue District to 5 twelve hour periods beginning Monday, July 23 at 6 a.m. Fishing periods will run from 6 a.m. to 6 p.m. on Monday, Tuesday, Wednesday, Thursday, and end Friday, July 27.	The return to the Kobuk River remains strong with the Kobuk test fish project catch indices well above average. To allow additional harvest on the return to the Kobuk River an additional 12-hour period has been allowed for this week. Two buyers are registered and both have a concern for their ability to effectively transport fish out of Kotzebue to potential markets. This series of more frequent short openings was successful last year at improving fish quality and reducing the risk of salmon not making it to market by keeping daily volumes low. To date the catch of approximately 42,000 chum salmon for the first two weeks was above average. The most reliable index of chum salmon run strength is the commercial catch rate. Management using comparisons of catch rate trends will need to be modified for relevance with the shorter, more frequent openings. Age composition, test fisheries, and subsistence reports will be factors in management decisions as periods are shortened. The first few weeks of the Kotzebue Sound commercial fishery the catch is predominately Kobuk River stocks. The department test net on the Kobuk River has been indexing escapement passage at Kiana since 1993. To date the catch is tracking well above average and the department predicts that escapement goals will easily be met. Residents on the Kobuk River have reported that their subsistence needs are being met.
3-S-X-05-01	July 25, 2001	This emergency order reduces the commercial salmon fishing time in the Kotzebue District for Wednesday's commercial period which was originally scheduled for 12 hours to 1 eight-hour period from 6:00 a.m. Wednesday, July 25, 2001 until 2 p.m. Wednesday, July 25, 2001. No further commercial fishing periods on Thursday and Friday are affected	Early indications are that the chum salmon run is strong and the number of fishers participating increased this week. Catches have been above average and the amount of fish harvested has began to affect the buyer's ability to transport it out of Kotzebue. Because of large catches on Monday and Tuesday the largest buyer will not be able to purchase fish on Wednesday. The one buyer for Wednesday's opening is not able to handle the volume and has asked that the department reduce the amount of hours that fishing is open to prevent waste. This shorter opening is designed to reduce the risk of salmon not making it to market by keeping daily volumes low. To date the catch of approximately 74,000 chum salmon for the first two and half weeks was above average. The most reliable index of chum salmon run strength is the commercial catch rate. Management using comparisons of catch rate trends will need to be modified for relevance with the shorter, more frequent openings.
3-S-X-06-01	July 30, 2001	This emergency order opens commercial salmon fishing in the Kotzebue District to 1 eight-hour period from 8:00 a.m. Monday, July 30, 2001 until 4:00 p.m. Monday, July 30, 2001.	This series of more frequent short openings is designed to improve fish quality and reduce the risk of salmon not making it to market by keeping daily volumes low. To date the catch of approximately 99,000 chum salmon for the first three weeks was above average. The most reliable index of chum salmon run strength is the commercial catch rate. Management using comparisons of catch rate trends will need to be modified for relevance with the shorter, more frequent openings. Age composition, test fisheries, and subsistence reports will be factors in management decisions as periods are shortened. The first few weeks of the Kotzebue Sound commercial fishery the catch is predominately Kobuk River stocks. The department test net on the Kobuk River has been indexing escapement passage at Kiana since 1993. To date the catch is tracking well above average and the department predicts that escapement goals will easily be met. Residents on the Kobuk River have reported that their subsistence needs are being met. As August nears Noatak River chum salmon will increase in the commercial catch and the department will monitor the fishery for indications of the strength of the Noatak River stocks.

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Emergency Order Number	Effective Date	Action Taken	Comments
3-S-X-07-01	July 31, 2001	This emergency order opens commercial salmon fishing in the Kotzebue District to 1 twelve-hour period from 6:00 a.m. Tuesday, July 31, 2001 until 6:00 p.m. Tuesday, July 31, 2001.	Both buyers have a concern for their ability to effectively transport fish out of Kotzebue to potential markets. Buyers requested a normal 12-hour period. This series of more frequent short openings is designed to improve fish quality and reduce the risk of salmon not making it to market by keeping daily volumes low. To date the catch of approximately 99,000 chum salmon for the first three weeks was above average. The most reliable index of chum salmon run strength is the commercial catch rate. Management using comparisons of catch rate trends will need to be modified for relevance with the shorter, more frequent openings. Age composition, test fisheries, and subsistence reports will be factors in management decisions as periods are shortened. The first few weeks of the Kotzebue Sound commercial fishery the catch is predominately Kobuk River stocks. The department test net on the Kobuk River has been indexing escapement passage at Kiana since 1993. To date the catch is tracking well above average and the department predicts that escapement goals will easily be met. Residents on the Kobuk River have reported that their subsistence needs are being met. As August nears Noatak River chum salmon will increase in the commercial catch and the department will monitor the fishery for indications of the strength of the Noatak River stocks. The department forecasted an average run of Noatak River chum salmon and if the Noatak River chum salmon run falls below average then the restrictions in fishing time may be necessary the second week of August.
3-S-X-08-01	August 1, 2001	This emergency order opens commercial salmon fishing in the Kotzebue District to 1 eight-hour period from 8:00 a.m. Wednesday, August 1, 2001 until 4:00 p.m. Wednesday, August 1, 2001.	Buyers requested a 8-hour period. This series of more frequent short openings is designed to improve fish quality and reduce the risk of salmon not making it to market by keeping daily volumes low. To date the catch of approximately 99,000 chum salmon for the first three weeks was above average. The most reliable index of chum salmon run strength is the commercial catch rate. Management using comparisons of catch rate trends will need to be modified for relevance with the shorter, more frequent openings. Age composition, test fisheries, and subsistence reports will be factors in management decisions as periods are shortened. The first few weeks of the Kotzebue Sound commercial fishery the catch is predominately Kobuk River stocks. The department test net on the Kobuk River has been indexing escapement passage at Kiana since 1993. To date the catch is tracking well above average and the department predicts that escapement goals will easily be met. Residents on the Kobuk River have reported that their subsistence needs are being met. As August nears Noatak River chum salmon will increase in the commercial catch and the department will monitor the fishery for indications of the strength of the Noatak River stocks. The department forecasted an average run of Noatak River chum salmon and if the Noatak River chum salmon run falls below average then the restrictions in fishing time may be necessary the second week of August.

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Emergency Order Number	Effective Date	Action Taken	Comments
3-S-X-09-01	August 2, 2001	This emergency order opens commercial salmon fishing in the Kotzebue District to 1 six-hour period from 8:00 a.m. Thursday, August 2, 2001 until 2:00 p.m. Thursday, August 2, 2001.	Buyers requested a 6-hour period. This series of more frequent short openings is designed to improve fish quality and reduce the risk of salmon not making it to market by keeping daily volumes low. To date the catch of approximately 99,000 chum salmon for the first three weeks was above average. The most reliable index of chum salmon run strength is the commercial catch rate. Management using comparisons of catch rate trends will need to be modified for relevance with the shorter, more frequent openings. Age composition, test fisheries, and subsistence reports will be factors in management decisions as periods are shortened. The first few weeks of the Kotzebue Sound commercial fishery the catch is predominately Kobuk River stocks. The department test net on the Kobuk River has been indexing escapement passage at Kiana since 1993. To date the catch is tracking well above average and the department predicts that escapement goals will easily be met. Residents on the Kobuk River have reported that their subsistence needs are being met.
3-S-X-10-01	August 3, 2001	This emergency order opens commercial salmon fishing in the Kotzebue District to 1 twelve-hour period from 6:00 a.m. Friday, August 3, 2001 until 6:00 p.m. Friday, August 3, 2001.	Buyers requested a normal 12-hour period. This series of more frequent short openings is designed to improve fish quality and reduce the risk of salmon not making it to market by keeping daily volumes low. To date the catch of approximately 99,000 chum salmon for the first three weeks was above average. The most reliable index of chum salmon run strength is the commercial catch rate. Management using comparisons of catch rate trends will need to be modified for relevance with the shorter, more frequent openings. Age composition, test fisheries, and subsistence reports will be factors in management decisions as periods are shortened. The first few weeks of the Kotzebue Sound commercial fishery the catch is predominately Kobuk River stocks. The department test net on the Kobuk River has been indexing escapement passage at Kiana since 1993. To date the catch is tracking well above average and the department predicts that escapement goals will easily be met. Residents on the Kobuk River have reported that their subsistence needs are being met.
3-S-X-11-01	August 7, 2001	This emergency order opens commercial salmon fishing in the Kotzebue District to 1 twelve-hour period from 6:00 a.m. Tuesday, August 7, 2001 until 6:00 p.m. Tuesday, August 7, 2001.	Buyers requested the next opening be a normal 12-hour period. This series of more frequent short openings is designed to improve fish quality and reduce the risk of salmon not making it to market by keeping daily volumes low. To date the catch of approximately 146,000 chum salmon for the first four weeks was average and the CPUE is above average. The average harvest is attributed to the buyers asking for reduced fishing time. The most reliable index of chum salmon run strength is the commercial catch rate. Management using comparisons of catch rate trends will need to be modified for relevance with the shorter, more frequent openings. Age composition, test fisheries, and subsistence reports will be factors in management decisions as periods are shortened. The first few weeks of the Kotzebue Sound commercial fishery the catch is predominately Kobuk River stocks. The department test net on the Kobuk River has been indexing escapement passage at Kiana since 1993. To date the catch is tracking well above average and the department predicts that escapement goals will easily be met. Residents on the Kobuk River have reported that their subsistence needs are being met. As August nears Noatak River chum salmon will increase in the commercial catch and the department will monitor the fishery for indications of the strength of the Noatak River stocks. The department forecasted an average run of Noatak River chum salmon and if the Noatak River chum salmon run falls below average then the restrictions in fishing time may be necessary the second week of August.

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Emergency Order Number	Effective Date	Action Taken	Comments
3-S-X-12-01	August 8, 2001	This emergency order opens commercial salmon fishing in the Kotzebue District to 1 twelve-hour period from 6:00 a.m. Wednesday, August 8, 2001 until 6:00 p.m. Wednesday, August 8, 2001.	Buyers requested the next opening be a normal 12-hour period. This series of more frequent short openings is designed to improve fish quality and reduce the risk of salmon not making it to market by keeping daily volumes low. To date the catch of approximately 146,000 chum salmon for the first four weeks was average and the CPUE is above average. The average harvest is attributed to the buyers asking for reduced fishing time. The most reliable index of chum salmon run strength is the commercial catch rate. Management using comparisons of catch rate trends will need to be modified for relevance with the shorter, more frequent openings. Age composition, test fisheries, and subsistence reports will be factors in management decisions as periods are shortened. The first few weeks of the Kotzebue Sound commercial fishery catch is predominately Kobuk River stocks. The department test net on the Kobuk River has been indexing escapement passage at Kiana since 1993. To date the catch is tracking well above average and the department predicts that escapement goals will easily be met. Residents on the Kobuk River have reported that their subsistence needs are being met. The age composition in the commercial fishery has shifted to more four-year-old fish. The commercial harvest is now believed to have a majority of Noatak River stocks. Recent catches in the commercial fishery have been average. The department forecasted an average run of Noatak River chum salmon and if the Noatak River chum salmon run falls below average then the restrictions in fishing time may be necessary the second week of August. Catches to date indicate that no reduction in fishing time is necessary.
3-S-X-13-01	August 9, 2001	This emergency order opens commercial salmon fishing in the Kotzebue District to 1 twelve-hour period from 6:00 a.m. Thursday, August 9, 2001 until 6:00 p.m. Thursday, August 9, 2001.	The first two openings this week have been 12 hours and buyers have been able to keep up with the harvest. Only one buyer purchased fish during yesterday's commercial period and that lone buyer believes that their company can handle the volume of another 12-hour opening. To date the catch of approximately 169,000 chum salmon has been average when compared to the long term averages (10 and 20 years) and above average when compared to the recent 5-year average. The recent 5-year average is more effected by buyer capacity as is this years average. The most reliable index of chum salmon run strength is the commercial catch rate. Management using comparisons of catch rate trends will need to be modified for relevance with the shorter, more frequent openings. Age composition, test fisheries, and subsistence reports will be factors in management decisions as periods are shortened. The first few weeks of the Kotzebue Sound commercial fishery catch is predominately Kobuk River stocks. The department test net on the Kobuk River has been indexing escapement passage at Kiana since 1993. To date the catch is tracking well above average and the department predicts that escapement goals will easily be met. Residents on the Kobuk River have reported that their subsistence needs are being met. The age composition in the commercial fishery has recently shifted to more four-year-old fish. The commercial harvest is now believed to have a majority of Noatak River stocks. Recent catches in the commercial fishery have been average. The department did test fishing on the afternoon of August 8 on the Noatak River and the age and sex composition of the test fish catch was similar to the commercial harvest. The department forecasted an average run of Noatak River chum salmon. All indications are that the Noatak River salmon run is at average strength and no reduction of commercial fishing time is neces

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Emergency Order Number	Effective Date	Action Taken	Comments
3-S-X-14-01	August 10, 2001	This emergency order opens commercial salmon fishing in the Kotzebue District to 1 twelve-hour period from 6:00 a.m. Friday, August 10, 2001 until 6:00 p.m. Friday, August 10, 2001.	This series of more frequent short openings is designed to improve fish quality and reduce the risk of salmon not making it to market by keeping daily volumes low. To date the catch of approximately 180,000 chum salmon has been within the recent 5-year average range. The average harvest is attributed to the buyers asking for reduced fishing time. The most reliable index of chum salmon run strength is the commercial catch rate. The first few weeks of the Kotzebue Sound commercial fishery catch is predominately Kobuk River stocks. The department test net on the Kobuk River has been indexing escapement passage at Kiana since 1993. To date the catch is tracking well above average and the department predicts that escapement goals will easily be met. Residents on the Kobuk River have reported that their subsistence needs are being met. The age composition in the commercial fishery has shifted to more four-year-old fish. The commercial harvest is now believed to have a majority of Noatak River stocks. Catches have continued to be average. The department did test fishing on the afternoon of August 8 on the Noatak River and the age and sex composition of the test fish catch was similar to the commercial harvest. The department forecasted an average run of Noatak River chum salmon. All indications are that the Noatak River chum salmon run is of average strength and no reduction of commercial fishing time is necessary.
3-S-X-15-01	August 14, 2001	This emergency order opens commercial salmon fishing in the Kotzebue District to 4 twelve-hour periods beginning Tuesday, August 14 at 6 a.m. Fishing periods will run from 6 a.m. to 6 p.m. on Tuesday, Wednesday, Thursday, and end Friday, August 17.	This week there is likely to be only one buyer as the other buyer has closed operations for the season. The remaining buyer has a concern for their ability to effectively transport fish out of Kotzebue to potential markets. The buyer has requested that the department contact them the evening before the next days opening and the buyer will give the amount of hours the commercial fishery should be opening considering the buyer's capacity limits. The fishery is planned to be open for 12 hours from 6 A.M. to 6 P.M. Tuesday through Friday next week. This series of more frequent short openings is designed to improve fish quality and reduce the risk of salmon not making it to market by keeping daily volumes low. If the buyer requests a shorter than 12-hour opening then this Emergency Order will be superceded to reduce the opening hours on those days the buyer requests.
3-S-X-16-01	August 20, 2001	This emergency order opens commercial salmon fishing in the Kotzebue District to 5 twelve-hour periods beginning Monday, August 20 at 6 a.m. Fishing periods will run from 6 a.m. to 6 p.m. on Monday, Tuesday, Wednesday, Thursday, and end Friday, August 24.	This series of more frequent short openings is designed to improve fish quality and reduce the risk of salmon not making it to market by keeping daily volumes low. If the buyer requests a shorter than 12-hour opening then this Emergency Order will be superceded to reduce the opening hours on those days the buyer requests. To date the catch of approximately 203,000 chum salmon has been within the recent 5-year average range. The average harvest is attributed to the buyers asking for reduced fishing time. The most reliable index of chum salmon run strength is the commercial catch rate. Management using comparisons of catch rate trends will need to be modified for relevance with the shorter, more frequent openings. Age composition, test fisheries, and subsistence reports will be factors in management decisions as periods are shortened.

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Emergency Order Number	Effective Date	Action Taken	Comments
3-H-Z-1-01	June 12, 2001	This emergency order opens the Norton Sound Subdistricts 2 and 3 to commercial gillnet herring fishing from 11:00am Tuesday, June 12, 2001 until 3:00pm Tuesday, June 12, 2001. Each vessel may operate 50 fathoms of gillnet. There is the possibility of an extension. An announcement regarding if an extension is allowed will be made at 2:00pm on VHF 7a and SSB 4125.	This emergency order opens the Norton Sound Subdistricts 2 and 3 to commercial gillnet herring fishing from 11:00am Tuesday, June 12, 2001 until 3:00pm Tuesday, June 12, 2001. Each vessel may operate 50 fathoms of gillnet. There is the possibility of an extension. An announcement regarding if an extension is allowed will be made at 2:00pm on VHF 7a and SSB 4125.
3-H-Z-2-01	June 12, 2001	This emergency order extends the commercial gillnet herring fishing period established by 3-H-Z-1-01 by 4 additional hours in Subdistricts 2 and 3. This commercial herring gillnet fishing period will now close at 7pm Tuesday, June 7. Each vessel may operate 50 fathoms of gillnet only. There is the possibility of an extension. An announcement regarding if an extension is allowed will be made at 5:30pm on VHF 7a and SSB 4125.	The department projections for the 2001 spawning biomass, for the Norton Sound sac roe fishery is 26,305 tons. A 20% exploitation rate would result in a guideline harvest level for the Norton Sound District of 5,261 tons with 4,447 tons allocated to the gillnet fishery. There is a limited market for sac roe herring this season, and the harvest is anticipated to fall far short of the harvest guideline. Commercial samples taken during the period established by Emergency Order No, 3-H-Q-1-01 indicates a roe recovery of above 10% in Subdistrict 3. Based on input from buyers regarding good roe quality, it is warranted to extend the commercial gillnet herring fishing period an additional 4 hours. Because it is still early in the herring spawning migration, fish quality can be mixed. This initial gillnet fishing period with reduced gear limits is intended to further test the commercial quality of the herring available. An extension of fishing time may be possible if product conditions and abundance warrant. Permit holders are cautioned to be sure they can sell their fish and they should check their roe quality frequently while loading their fishing boat.
3-H-Z-3-01	June 13, 2001	This emergency order opens the Norton Sound Subdistrict 1 to commercial gillnet herring fishing from 1:30pm Wednesday, June 13, 2001 until 5:30pm Wednesday, June 13, 2001. Each vessel may operate 50 fathoms of gillnet. There is the possibility of an extension. An announcement regarding if an extension is allowed will be made at 4:30pm on VHF 7a and SSB 4125.	Herring were observed in large quantities in Norton Sound Subdistrict 1 on June 13. Approximately 1 mile of continuous spawn was sighted at Klikitarik and spot spawn was sighted at various other location. Samples taken by commercial fishermen in Norton Sound Subdistrict 1 on June 13, averaged 12 - 13% mature roe. Although it is still early in the run, the department's test fish samples indicate the herring return is similar to the 2001 preseason projection which characterizes the Norton Sound stock as stable and healthy. The department projections for the 2001 spawning biomass, for the Norton Sound sac roe fishery is 26,305 tons. A 20% exploitation rate would result in a guideline harvest level for the Norton Sound District of 5,261 tons with 4,447 tons allocated to the gillnet fishery. There is a limited market for sac roe herring this season, and the harvest is anticipated to fall far short of the harvest guideline. Because it is still early in the herring spawning migration, fish quality can be mixed. This gillnet fishing period with reduced gear limits is intended to further test the commercial quality of the herring available as this will be the first opening in Subdistrict 1. Also, there is extensive ice in Subdistrict 1 and fishing one net will provide a measure of prevention from the possibility of fishers nets getting entangled in ice. An extension of fishing time may be possible if product conditions and abundance warrant. Permit holders are cautioned to be sure they can sell their fish and they should check their quality frequently while loading their fishing boat.

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Emergency Order Number	Effective Date	Action Taken	Comments
3-H-Z-4-01	June 13, 2001	This emergency order extends the commercial gillnet herring fishing period established by 3-H-Z-3-01 by 4 additional hours in Subdistrict 1. This commercial herring gillnet fishing period will now close at 9:30pm Wednesday, June 13. Each vessel may operate 50 fathoms of gillnet. There is the possibility of an extension. An announcement regarding if an extension is allowed will be made at 8:30pm on VHF 7a and SSB 4125.	The department documented 5,416 st of herring in Norton Sound Subdistrict 1 today. The department projections for the 2001 spawning biomass, for the Norton Sound sac roe fishery is 26,305 tons. A 20% exploitation rate would result in a guideline harvest level for the Norton Sound District of 5,261 tons with 4,447 tons allocated to the gillnet fishery. There is a limited market for sac roe herring this season, and the harvest is anticipated to fall far short of the harvest guideline. Commercial samples taken during the period established by Emergency Order No, 3-H-Z-3-01 showed good quality herring. Based on input from buyers regarding good roe quality, it is warranted to extend the commercial gillnet herring fishing period an additional 4 hours. Because it is still early in the herring spawning migration, fish quality can be mixed. This gillnet fishing period with reduced gear limits is intended to further test the commercial quality of the herring available. In addition, the one net restriction is a necessary precaution because of extensive ice in Subdistrict 1. An extension of fishing time may be possible if product conditions and abundance warrant. Permit holders are cautioned to be sure they can sell their fish and they should check their roe quality frequently while loading their fishing boat.
3-H-Z-5-01	June 13, 2001	This emergency order extends the commercial gillnet herring fishing period established by 3-H-Z-4-01 by 4 additional hours in Subdistrict 1. This commercial herring gillnet fishing period will now close at 1:30am Thursday, June 14. Each vessel may operate 50 fathoms of gillnet.	The department documented 5,416 st of herring in Norton Sound Subdistrict 1 today. The department projections for the 2001 spawning biomass, for the Norton Sound sac roe fishery is 26,305 tons. A 20% exploitation rate would result in a guideline harvest level for the Norton Sound District of 5,261 tons with 4,447 tons allocated to the gillnet fishery. There is a limited market for sac roe herring this season, and the harvest is anticipated to fall far short of the harvest guideline. Commercial samples taken during the period established by Emergency Order No, 3-H-Z-4-01 showed good quality herring. Based on input from buyers regarding good roe quality, it is warranted to extend the commercial gillnet herring fishing period an additional 4 hours. Because it is still early in the herring spawning migration, fish quality can be mixed. This gillnet fishing period with reduced gear limits is intended to further test the commercial quality of the herring available. In addition, the one net restriction is a necessary precaution because of extensive ice in Subdistrict 1. Permit holders are cautioned to be sure they can sell their fish and they should check their roe quality frequently while loading their fishing boat.
3-H-Z-6-01	June 14, 2001	This emergency order opens Norton Sound Subdistricts 1, 2 and 3 to commercial herring gillnet fishing from 10:00am Thursday, June 14, 2001 until 2:00pm Thursday, June 14, 2001. Each vessel may operate 50 fathoms of gillnet. There is the possibility of an extension. An announcement regarding an extension will be made at 1:00pm on VHF 7a and SSB 4125.	The commercial period in Norton Sound Subdistrict 1 on June 13 produced 157 st of herring with roe recovery of 12.9%. Samples taken by commercial fishermen in Norton Sound Subdistrict 3 on June 14, averaged 15-21% mature roe. The department's test fish samples continue to indicate that the herring return is similar to the 2001 preseason projection. A 20% exploitation rate would result in a guideline harvest level for the Norton Sound District of 5,261 tons with 4,447 tons allocated to the gillnet fishery. There is a limited market for sac roe herring this season, and the harvest is anticipated to fall far short of the harvest guideline. Based on input from buyers regarding good roe quality, it is warranted to open commercial gillnet herring fishing for a 4-hour period. An extension of fishing time may be possible if product conditions and abundance warrant. Permit holders are cautioned to be sure they can sell their fish and they should check their roe quality frequently while loading their fishing boat. If the buyer will not accept the catch it will be the responsibility of the permit holder to find a use for the herring. Do not dump your herring. The permit holder can be cited if the fish are wasted.

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Emergency Order Number	Effective Date	Action Taken	Comments
3-H-Z-7-01	June 14, 2001	This emergency order extends the commercial herring gillnet fishing period established by 3-H-Z-6-01 by 4 additional hours in Norton Sound Subdistricts 1, 2 and 3. This commercial herring gillnet fishing period will now close at 6:00pm Thursday, June 14. Each vessel may operate 50 fathoms of gillnet. There is the possibility of an extension. An announcement regarding an extension will be made at 5:00pm on VHF 7a and SSB 4125.	Commercial samples taken during the period established by Emergency Order No, 3-H-Z-6-01 showed good quality herring. Samples from Norton Sound Subdistrict 1 and 3 averaged 12-18% and 12% mature roe respectively. The department's test fish samples continue to indicate that the herring return is similar to the 2001 preseason projection. A 20% exploitation rate would result in a guideline harvest level for the Norton Sound District of 5,261 tons with 4,447 tons allocated to the gillnet fishery. There is a limited market for sac roe herring this season, and the harvest is anticipated to fall far short of the harvest guideline. Based on input from buyers regarding good roe quality, it is warranted to extend the commercial gillnet herring fishing period an additional 4 hours. An extension of fishing time may be possible if product conditions and abundance warrant. Permit holders are cautioned to be sure they can sell their fish and they should check their roe quality frequently while loading their fishing boats. If the buyer will not accept the catch it will be the responsibility of the permit holder to find a use for the herring. Do not dump your herring. The permit holder can be cited if the fish are wasted.
3-H-Z-8-01	June 14, 2001	This emergency order extends the commercial herring gillnet fishing period established by 3-H-Z-7-01 by 4 additional hours in Norton Sound Subdistricts 1, 2 and 3. This commercial herring gillnet fishing period will now close at 10:00pm Thursday, June 14. Each vessel may operate 50 fathoms of gillnet. There is the possibility of an extension. An announcement regarding an extension will be made at 9:00pm on VHF 7a and SSB 4125.	Commercial samples taken during the period established by Emergency Order No, 3-H-Z-7-01 showed good quality herring. Samples from Norton Sound Subdistrict 1 and 3 averaged 10-13% and 12-13% mature roe respectively. The department's test fish samples continue to indicate that the herring return is similar to the 2001 preseason projection. A 20% exploitation rate would result in a guideline harvest level for the Norton Sound District of 5,261 tons with 4,447 tons allocated to the gillnet fishery. There is a limited market for sac roe herring this season, and the harvest is anticipated to fall far short of the harvest guideline. Based on input from buyers regarding good roe quality, it is warranted to extend the commercial gillnet herring fishing period an additional 4 hours. An extension of fishing time may be possible if product conditions and abundance warrant. Permit holders are cautioned to be sure they can sell their fish and they should check their roe quality frequently while loading their fishing boats. If the buyer will not accept the catch it will be the responsibility of the permit holder to find a use for the herring. Do not dump your herring. The permit holder can be cited if the fish are wasted.
3-H-Z-9-01	June 14, 2001	This emergency order extends the commercial herring gillnet fishing period established by 3-H-Z-8-01 by 4 additional hours in Norton Sound Subdistricts 1. This commercial herring gillnet fishing period will now close at 2:00am Friday, June 15. Each vessel may operate 50 fathoms of gillnet.	Commercial samples taken during the period established by Emergency Order No, 3-H-Z-8-01 showed good quality herring. Samples from Norton Sound Subdistrict 1 averaged 13% mature roe. The department's test fish samples continue to indicate that the herring return is similar to the 2001 preseason projection. A 20% exploitation rate would result in a guideline harvest level for the Norton Sound District of 5,261 tons with 4,447 tons allocated to the gillnet fishery. There is a limited market for sac roe herring this season, and the harvest is anticipated to fall far short of the harvest guideline. Permit holders are cautioned to be sure they can sell their fish and they should check their roe quality frequently while loading their fishing boats. If the buyer will not accept the catch it will be the responsibility of the permit holder to find a use for the herring. Do not dump your herring. The permit holder can be cited if the fish are wasted.

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Emergency Order Number	Effective Date	Action Taken	Comments
3-H-Z-10-01	June 15, 2001	This emergency order opens Norton Sound Subdistricts 1, 2 and 3 to commercial herring gillnet fishing from 10:00am Friday, June 15, 2001 until 2:00pm Friday, June 15, 2001. Each vessel may operate 50 fathoms of gillnet. There is the possibility of an extension. An announcement regarding an extension will be made at 1:00pm on VHF 7a and SSB 4125.	The commercial period in Norton Sound Subdistrict 1,2 and 3 on June 14 produced 438 st of herring with roe recovery of 12.2%. The total gillnet harvest to date is 1,347.8 st with roe recovery of 12.1%. A partial aerial survey in Subdistrict 1 the evening of June 14 estimated 6,000 st of herring. The department's test fish samples continue to indicate that the herring return is similar to the 2001 preseason projection. A 20% exploitation rate would result in a guideline harvest level for the Norton Sound District of 5,261 tons with 4,447 tons allocated to the gillnet fishery. There is a limited market for sac roe herring this season, and the harvest is anticipated to fall far short of the harvest guideline. Based on input from buyers regarding good roe quality, it is warranted to open commercial gillnet herring fishing for a 4-hour period. An extension of fishing time may be possible if product conditions and abundance warrant.
3-H-Z-11-01	June 15, 2001	This emergency order extends the commercial herring gillnet fishing period established by 3-H-Z-10-01 by 4 additional hours in Norton Sound Subdistricts 1, 2 and 3. This commercial herring gillnet fishing period will now close at 6:00pm Friday, June 15. Each vessel may operate 50 fathoms of gillnet. There is the possibility of an extension. An announcement regarding an extension will be made at 5:00pm on VHF 7a and SSB 4125.	The Norton Sound herring biomass continues to build and spawning is well underway. The commercial period in Norton Sound Subdistrict 1,2 and 3 on June 14 produced 438 st of herring with roe recovery of 12.2%. The total gillnet harvest to date is 1,347.8 short tons with roe recovery of 12.1%. The June 14 aerial survey estimated approximately 6,000 short tons in a partial survey of Subdistrict 1. The department's test fish samples continue to indicate that the herring return is similar to the 2001 preseason projection. A 20% exploitation rate would result in a guideline harvest level for the Norton Sound District of 5,261 tons with 4,447 tons allocated to the gillnet fishery. There is a limited market for sac roe herring this season, and the harvest is anticipated to fall far short of the harvest guideline. Based on input from buyers regarding good roe quality, it is warranted to extend the commercial gillnet herring fishing period an additional 4 hours. Another extension of fishing time may be possible if product conditions and abundance warrant.
3-H-Z-12-01	June 15, 2001	This emergency order extends the commercial herring gillnet fishing period established by 3-H-Z-11-01 by 4 additional hours in Norton Sound Subdistricts 1, 2 and 3. This commercial herring gillnet fishing period will now close at 10:00pm Friday, June 15. Each vessel may operate 50 fathoms of gillnet. There is the possibility of an extension. An announcement regarding an extension will be made at 9:00pm on VHF 7a and SSB 4125.	The Norton Sound herring biomass continues to build and spawning is well underway. The commercial period in Norton Sound Subdistrict 1,2 and 3 on June 14 produced 438 st of herring with roe recovery of 12.2%. The total gillnet harvest to date is 1,347.8 short tons with roe recovery of 12.1%. The June 14 aerial survey estimated approximately 6,000 short tons in a partial survey of Subdistrict 1. The department's test fish samples continue to indicate that the herring return is similar to the 2001 preseason projection. A 20% exploitation rate would result in a guideline harvest level for the Norton Sound District of 5,261 tons with 4,447 tons allocated to the gillnet fishery. There is a limited market for sac roe herring this season, and the harvest is anticipated to fall far short of the harvest guideline. Based on input from buyers regarding good roe quality, it is warranted to extend the commercial gillnet herring fishing period an additional 4 hours. Another extension of fishing time may be possible if product conditions and abundance warrant. Permit holders are cautioned to be sure they can sell their fish and they should check their roe quality frequently while loading their fishing boats. If the buyer will not accept the catch it will be the responsibility of the permit holder to find a use for the herring. Do not dump your herring. The permit holder can be cited if the fish are wasted.

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Emergency Order Number	Effective Date	Action Taken	Comments
3-H-Z-13-01	June 15, 2001	This emergency order extends the commercial herring gillnet fishing period established by 3-H-Z-12-01 by 4 additional hours in Norton Sound Subdistricts 1, 2 and 3. This commercial herring gillnet fishing period will now close at 2:00am Saturday, June 16. Each vessel may operate 50 fathoms of gillnet. There is the possibility of an extension. An announcement regarding an extension will be made at 9:00pm on VHF 7a and SSB 4125.	The Norton Sound herring biomass continues to build and spawning is well underway. The commercial period in Norton Sound Subdistrict 1,2 and 3 on June 14 produced 438 st of herring with roe recovery of 12.2%. The total gillnet harvest to date is 1,347.8 short tons with roe recovery of 12.1%. The June 14 aerial survey estimated approximately 6,000 short tons in a partial survey of Subdistrict 1. The department's test fish samples continue to indicate that the herring return is similar to the 2001 preseason projection. A 20% exploitation rate would result in a guideline harvest level for the Norton Sound District of 5,261 tons with 4,447 tons allocated to the gillnet fishery. There is a limited market for sac roe herring this season, and the harvest is anticipated to fall far short of the harvest guideline. Based on input from buyers regarding good roe quality, it is warranted to extend the commercial gillnet herring fishing period an additional 4 hours. Another extension of fishing time may be possible if product conditions and abundance warrant.
3-H-Z-14-01	June 16, 2001	This emergency order opens the Norton Sound Subdistrict 1, to commercial gillnet herring fishing from 10:00am Saturday, June 16, 2001 until 2:00pm Saturday, June 16, 2001. Each vessel may operate 50 fathoms of gillnet. There is the possibility of an extension. An announcement regarding if an extension is allowed will be made at 1:00pm on VHF 7a and SSB 4125.	Yesterday's harvest in a 16-hour commercial period was approximately 400 tons at 11.5% in Subdistricts 1 and 3. No herring have been purchased to date in Subdistrict 2. To date, the Norton Sound herring harvest is approximately 1,750 tons at 12%. Biomass for the Norton Sound District is projected to be 26,305 tons and a 20% exploitation rate would result in a guideline harvest level of 5,261 tons with 4,447 tons allocated to the gillnet fishery. There is a limited market for sac roe herring this season, and the harvest is anticipated to fall far short of the harvest guideline. Preliminary reports from today's fishing period indicate that there is good roe quality with light volumes. There is now only one company that will continue to purchase herring as the other companies are leaving because of previous commitments. Based on the input of the one remaining company there is marketable herring in the district. A 4-hour opening at this time is justified. Because of market concerns, and ice in Subdistrict 1, the commercial fishing fleet will be restricted to one shackle of 50 fathom gillnet. An extension of fishing time may be possible if product conditions, herring abundance and tender capacities are favorable.
3-H-Z-15-01	June 16, 2001	This emergency order extends the commercial herring gillnet fishing period established by Emergency Order 3-H-Z-14-01 an additional four hours in Norton Sound Subdistricts 1, 2 and 3 from 2:00pm Saturday, June 16, 2001 until 6:00pm Saturday, June 16, 2001. Each vessel may operate 50 fathoms of gillnet. There is the possibility of an extension.	Poor weather has been preventing effective aerial surveys of the district. The June 14 aerial survey estimated 6,000 tons of herring and 7.5 miles of spawn in a partial survey of Subdistrict 1. The department test net catches indicate that the age composition is similar to that projected for the 2001 season. The 2001 preseason projection characterized the Norton Sound stock as stable and healthy. Yesterday's harvest in a 16-hour commercial period was approximately 400 tons at 11.5% in Subdistricts 1 and 3. There is now only one company that will continue to purchase herring as the other companies are leaving because of previous commitments. Based on the input of the one remaining company there is marketable herring in the district. A 4-hour extension of the commercial fishing period is justified. Because of market concerns, and ice in Subdistrict 1, the commercial fishing fleet will be restricted to one shackle of 50 fathom gillnet. An extension of fishing time may be possible if product conditions, herring abundance and tender capacities are favorable.

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Emergency Order Number	Effective Date	Action Taken	Comments
3-H-Z-16-01	June 16, 2001	This emergency order extends the commercial herring gillnet fishing period established by Emergency Order 3-H-Z-15-01 an additional four hours in Norton Sound Subdistricts 1, 2 and 3. This commercial gillnet herring fishing period will be from 6:00pm Saturday, June 16, 2001 until 10:00pm Saturday, June 16, 2001. Each vessel may operate 50 fathoms of gillnet. There is the possibility of an extension. An announcement regarding if an extension is allowed will be made at 9:00pm on VHF 7a and SSB 4125.	Herring were first observed in large quantities on June 10 with the first herring spawn observed on June 11. Poor weather has been preventing effective aerial surveys of the district. The June 14 aerial survey estimated 6,000 tons of herring and 7.5 miles of spawn in a partial survey of Subdistrict 1. The department test net catches indicate that the age composition is similar to that projected for the 2001 season. The 2001 pre-season projection characterized the Norton Sound stock as stable and healthy. Yesterday's harvest in a 16-hour commercial period was approximately 400 tons at 11.5% in Subdistricts 1 and 3. No herring have been purchased to date in Subdistrict 2. To date the Norton Sound herring harvest is approximately 1,750 tons at 12%. Biomass for the Norton Sound District is projected to be 26,305 tons and a 20% exploitation rate would result in a guideline harvest level of 5,261 tons with 4,447 tons allocated to the gillnet fishery. There is a limited market for sac roe herring this season, and the harvest is anticipated to fall far short of the harvest guideline. Preliminary reports from today's fishing period indicate that there is good roe quality with light volumes. There is now only one company that will purchase herring as the other companies are leaving because of previous commitments. Based on the input of the one remaining company there is marketable herring in the district. A 4-hour extension of the commercial fishing period is justified. Because of market concerns, and ice in Subdistrict 1, the commercial fishing fleet will be restricted to one shackle of 50 fathom gillnet. An extension of fishing time may be possible if product conditions, herring abundance and tender capacities are favorable. Permit holders are cautioned to be sure they can sell their fish and they should check their roe quality frequently while loading their fishing boat. If the buyer will not accept the catch it will be the responsibility of the permit holder to find a use for the herring. Do not dump your herring. The permit holder can be cited if the fish are wasted.
3-H-Z-17-01	June 18, 2001	This emergency order opens the Norton Sound Subdistrict 1, to commercial gillnet herring fishing from 12:00pm Monday, June 18, 2001 until 4:00pm Monday, June 18, 2001. Each vessel may operate 50 fathoms of gillnet. There is the possibility of an extension. An announcement regarding if an extension is allowed will be made at 3:00pm on VHF 7a and SSB 4125.	Poor weather has been preventing effective aerial surveys of the Norton Sound district. The June 14 aerial survey estimated 6,000 tons of herring and 7.5 miles of spawn in a partial survey of Subdistrict 1. An aerial survey was flown on Saturday, June 16. A large amount of herring was observed from Unalakleet to Kilikitarik but the survey airplane could not fly above 800 foot due to low clouds and fog. The department test net catches indicate that the age composition is similar to that projected for the 2001 season. The 2001 pre-season projection characterized the Norton Sound stock as stable and healthy. The department test net catches indicate the smaller age class fish are arriving in the District. The total gillnet harvest after 5 commercial openings is 1,946 tons with average roe recovery of 12%. Biomass for the Norton Sound District is projected to be 26,305 tons and a 20% exploitation rate would result in a guideline harvest level of 5,261 tons with 4,447 tons allocated to the gillnet fishery. There is a limited market for sac roe herring this season, and the harvest is anticipated to fall far short of the harvest guideline. There is one buyer left in the Norton Sound District purchasing herring. They have indicated they would like a 4-hour opening to test herring quality and quantity. Because of market concerns, and ice in Subdistrict 1, the commercial fishing fleet will be restricted to one shackle of 50 fathom gillnet. An extension of fishing time may be possible if product conditions and abundance warrant. Permit holders are cautioned to be sure they can sell their fish and they should check their roe quality frequently while loading their fishing boat. If the buyer will not accept the catch it will be the responsibility of the permit holder to find a use for the herring.

Appendix G7. Emergency Orders issued during 2001.

Emergency Order Number	Effective Date	Action Taken	Comments
3-H-Z-18-01	June 18, 2001	This emergency order opens the Norton Sound Subdistricts 2 and 3, to commercial gillnet herring fishing from 2:00pm Monday, June 18, 2001 until 6:00pm Monday, June 18, 2001. Each vessel may operate 50 fathoms of gillnet. There is the possibility of an extension. An announcement regarding if an extension is allowed will be made at 5:00pm on VHF 7a and SSB 4125.	Poor weather has been preventing effective aerial surveys of the Norton Sound district. The June 14 aerial survey estimated 6,000 tons of herring and 7.5 miles of spawn in a partial survey of Subdistrict 1. An aerial survey was flown on Saturday, June 16. A large amount of herring was observed from Unalakleet to Kilikitarik but the survey airplane could not fly above 800 foot due to low clouds and fog. The department test net catches indicate that the age composition is similar to that projected for the 2001 season. The 2001 preseason projection characterized the Norton Sound stock as stable and healthy. The department test net catches indicate the smaller age class fish are arriving in the District. The total gillnet harvest after 5 commercial openings is 1,946 tons with average roe recovery of 12%. Biomass for the Norton Sound District is projected to be 26,305 tons and a 20% exploitation rate would result in a guideline harvest level of 5,261 tons with 4,447 tons allocated to the gillnet fishery. There is a limited market for sac roe herring this season, and the harvest is anticipated to fall far short of the harvest guideline. There is one buyer left in the Norton Sound District purchasing herring. They have indicated they would like a 4-hour opening to test herring quality and quantity. Because of market concerns, the commercial fishing fleet will be restricted to one shackle of 50 fathom gillnet. An extension of fishing time may be possible if product conditions and abundance warrant. Permit holders are cautioned to be sure they can sell their fish and they should check their roe quality frequently while loading their fishing boat. If the buyer will not accept the catch it will be the responsibility of the permit holder to find a use for the herring. Do not dump your herring. The permit holder can be cited if the fish are wasted.
3-H-Z-19-01	June 18, 2001	This emergency order extends the commercial herring gillnet fishing period established by Emergency Order 3-H-Z-17-01 an additional four hours in Norton Sound Subdistrict 1 to commercial gillnet herring fishing from 4:00pm Monday, June 18, 2001 until 8:00pm Monday, June 18, 2001. Each vessel may operate 50 fathoms of gillnet. There is the possibility of an extension. An announcement regarding if an extension is allowed will be made at 7:00pm on VHF 7a and SSB 4125.	Poor weather has been preventing effective aerial surveys of the Norton Sound district. The June 14 aerial survey estimated 6,000 tons of herring and 7.5 miles of spawn in a partial survey of Subdistrict 1. An aerial survey was flown on Saturday, June 16. A large amount of herring was observed from Unalakleet to Kilikitarik but the survey airplane could not fly above 800 foot due to low clouds and fog. The department test net catches indicate that the age composition is similar to that projected for the 2001 season. The 2001 preseason projection characterized the Norton Sound stock as stable and healthy. The department test net catches indicate the smaller age class fish are beginning to arrive in the District. The total gillnet harvest after 5 commercial openings is 1,946 tons with average roe recovery of 12%. Biomass for the Norton Sound District is projected to be 26,305 tons and a 20% exploitation rate would result in a guideline harvest level of 5,261 tons with 4,447 tons allocated to the gillnet fishery. There is a limited market for sac roe herring this season, and the harvest is anticipated to fall far short of the harvest guideline. There is one buyer left in the Norton Sound District purchasing herring. They have indicated they would like a 4-hour extension. Damples indicate quality is good but volume is light. Because of market concerns, and ice in Subdistrict 1, the commercial fishing fleet will be restricted to one shackle of 50 fathom gillnet. An extension of fishing time may be possible if product conditions and abundance warrant. Permit holders are cautioned to be sure they can sell their fish and they should check their roe quality frequently while loading their fishing boat. If the buyer will not accept the catch it will be the responsibility of the permit holder to find a use for the herring. Do not dump your herring. The permit holder can be cited if the fish are wasted.

Appendix G7. Emergency Orders issued during 2001.

Emergency Order Number	Effective Date	Action Taken	Comments
3-H-Z-20-01	June 19, 2001	This emergency order opens the Norton Sound Subdistrict 1 to commercial gillnet herring fishing from 12:00am Tuesday, June 19, 2001 until 9:00am Tuesday, June 19, 2001. Each vessel may operate 50 fathoms of gillnet. There is the possibility of an extension. An announcement regarding if an extension is allowed will be made at 8:00am on VHF 7a and SSB 4125.	Poor weather has been preventing effective aerial surveys of the Norton Sound district. The June 14 aerial survey estimated 6,000 tons of herring and 7.5 miles of spawn in a partial survey of Subdistrict 1. An aerial survey was flown on Saturday, June 16. A large amount of herring was observed from Unalakleet to Kilikitarik but the survey airplane could not fly above 800 foot due to low clouds and fog. The department test net catches indicate that the age composition is similar to that projected for the 2001 season. The 2001 preseason projection characterized the Norton Sound stock as stable and healthy. The department test net catches indicate the smaller age class fish are now arriving in the District. Biomass for the Norton Sound District is projected to be 26,305 tons and a 20% exploitation rate would result in a guideline harvest level of 5,261 tons with 4,447 tons allocated to the gillnet fishery. There is a limited market for sac roe herring this season, and the harvest is anticipated to fall far short of the harvest guideline. There is one buyer left in the Norton Sound District purchasing herring. The commercial openings in Subdistricts 1, 2 and 3 on June 18 harvested very little herring. Commercial samples indicated a mix of ripe and spawned out fish. The buyer has indicated they would like a 9-hour opening to test herring quality and quantity on the flooding tide. Because of market concerns, and ice in Subdistrict 1, the commercial fishing fleet will be restricted to one shackle of 50 fathom gillnet. An extension of fishing time may be possible if product conditions and abundance warrant.
3-H-Z-21-01	June 19, 2001	This emergency order opens the Norton Sound Subdistrict 3 to commercial gillnet herring fishing from 12:00am Tuesday, June 19, 2001 until 9:00am Tuesday, June 19, 2001. Each vessel may operate 50 fathoms of gillnet. There is the possibility of an extension. An announcement regarding if an extension is allowed will be made at 11:00am on VHF 7a and SSB 4125.	Poor weather has been preventing effective aerial surveys of the Norton Sound district. The June 14 aerial survey estimated 6,000 tons of herring and 7.5 miles of spawn in a partial survey of Subdistrict 1. An aerial survey was flown on Saturday, June 16. A large amount of herring was observed from Unalakleet to Kilikitarik but the survey airplane could not fly above 800 foot due to low clouds and fog. The department test net catches indicate that the age composition is similar to that projected for the 2001 season. The 2001 preseason projection characterized the Norton Sound stock as stable and healthy. The department test net catches indicate the smaller age class fish are now arriving in the District. Biomass for the Norton Sound District is projected to be 26,305 tons and a 20% exploitation rate would result in a guideline harvest level of 5,261 tons with 4,447 tons allocated to the gillnet fishery. There is a limited market for sac roe herring this season, and the harvest is anticipated to fall far short of the harvest guideline. There is one buyer left in the Norton Sound District purchasing herring. The commercial openings in Subdistricts 1, 2 and 3 on June 18 harvested very little herring. Commercial samples indicated a mix of ripe and spawned out fish. The buyer has indicated they would like a 4-hour opening to test herring quality and quantity. Because of market concerns, the commercial fishing fleet will be restricted to one shackle of 50 fathom gillnet. An extension of fishing time may be possible if product conditions and abundance warrant.

Appendix G7. Emergency Orders issued during 2001.

Emergency Order Number	Effective Date	Action Taken	Comments
3-H-Z-22-01	June 19, 2001	This emergency order extends the commercial gillnet herring period established by 3-H-Z-20-01 by four additional hours in Subdistrict 1. The commercial fishery will now close at 12:00pm Tuesday, June 19. Each vessel may operate 50 fathoms of gillnet. There is the possibility of an extension. An announcement regarding if an extension is allowed will be made at 11:00am on VHF 7a and SSB 4125.	Poor weather has been preventing effective aerial surveys of the Norton Sound district. The June 14 aerial survey estimated 6,000 tons of herring and 7.5 miles of spawn in a partial survey of Subdistrict 1. An aerial survey was flown on Saturday, June 16. A large amount of herring was observed from Unalakleet to Kilikitarik but the survey airplane could not fly above 800 foot due to low clouds and fog. The department test net catches indicate that the age composition is similar to that projected for the 2001 season. The 2001 preseason projection characterized the Norton Sound stock as stable and healthy. The department test net catches indicate the smaller age class fish are now arriving in the District. Biomass for the Norton Sound District is projected to be 26,305 tons and a 20% exploitation rate would result in a guideline harvest level of 5,261 tons with 4,447 tons allocated to the gillnet fishery. There is a limited market for sac roe herring this season, and the harvest is anticipated to fall far short of the harvest guideline. There is one buyer left in the Norton Sound District purchasing herring. The commercial openings in Subdistricts 1, 2 and 3 on June 18 harvested very little herring. Commercial samples indicated a mix of ripe and spawned out fish. Subdistrict 1 has been open for 9 hours previous to this extension will no marketable quantities of herring caught. The additional 3 hours of fishing time will allow the fleet to explore other areas in the district for herring. Because of market concerns, and ice in Subdistrict 1, the commercial fishing fleet will be restricted to one shackle of 50 fathom gillnet. An extension of fishing time may be possible if product conditions and abundance warrant.
3-H-Z-23-01	June 19, 2001	This emergency order opens Subdistrict 1, from Wood Point to Canal Point to herring spawn on wild kelp from 7:00pm Tuesday, June 19 to 11:00pm Tuesday, June 19.	One Norton Sound permit holder has approached the department staff regarding his wish to commercially harvest herring spawn on wild kelp. He has a limited market for that product. Only those permit holders who have not participated in the herring fishery to date may participate in this fishery. Only the permit holder may move containers of kelp product during the opening. Crewmembers may only assist in moving product after the closure. The opening is timed to coincide with a low tide and to close as the tide rises. Because there is no local market for the harvest, the permit holder is reminded that he must conform to the reporting regulations for the sale of commercial fish. The permit holder must provide the Unalakleet office with a fish ticket for your harvest.
3-K-Z-1-01	September 1, 2001	This emergency order closes the Norton Sound Section king crab open access fishery at 12 noon, Saturday, September 1, 2001.	The Norton Sound red king crab open access summer season is approaching the target harvest of 280,000 lbs of crab. By regulation, the CDQ fishery is allocated 7.5% of the combined summer season harvest. Therefore, the open access season must be closed to allow for the CDQ harvest. All fishers involved in the open access fishery must have all crab out of their fishing gear by 12 noon, Saturday, September 1, 2001. Pots that are left on the grounds from the open access fishery must have bait containers removed and doors open until they are permanently removed. Fishers who intend to participate in the CDQ portion of the summer crab fishery may keep gear in the water with bait containers removed and doors open until the CDQ fishery begins 12 noon, September 2, 2001.

Appendix G7. Emergency Orders issued during 2001.

Emergency Order Number	Effective Date	Action Taken	Comments
3 -K-Z-2-01	September 2, 2001	This emergency order opens the Norton Sound Section king crab CDQ fishery from 12 noon September 2, 2001 until 12 noon, September 9, 2001.	The Norton Sound red king crab open access summer season ended September 1 with a harvest of 286,871 pounds. By regulation, the CDQ fishery is allocated 7.5% of the combined summer season harvest. Therefore, the CDQ harvest quota is set at 23,260 pounds. Only fishers designated by the Norton Sound and Lower Yukon CDQ groups are allowed to participate in this portion of the king crab fishery. Fishers must have a CDQ fishing permit from Commercial Fisheries Entry Commission and register their vessel with ADF&G before they make their first delivery. It is important for fishers to understand that they are operating under the authority of the CDQ permit holder. It is the individual CDQ group's decision on how the CDQ crab quota will be harvested. Because this fishery is occurring in September, the department has concerns that molting crab will make them unmarketable and may increase mortality rates of crab returned to the water. The crab molt has already begun and incidence of molting crab will continue to increase during the month of September. The timing of the CDQ fishery is to optimize the harvest of quality crab while they still have good shell condition.