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NORTON SOUND - PORT CLARENCE - KOTZEBUE

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OFFICE OF EQUAL OPPORTUNITY (OEO) STATEMENT

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PRESENTATION

This report summarizes the 2004 season and historical information concerning management of the commercial and subsistence fisheries of 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 were included and are indicated by appropriate footnotes. Current year catch data presented were derived from seasonal field data.

This report is organized into the following major sections:

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

Tabular data has been separated into two categories to facilitate use of this report: 1) tables (1-15) presenting annual data, and 2) appendices presenting historical comparisons. Not all appendices are cited in the text.

SECTION 1: SALMON

(Includes Norton Sound, Port Clarence and Kotzebue Districts)

INTRODUCTION

Boundaries

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

Salmon Resources

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

Commercial Fishery

In 1959 and 1960, Alaska Department of Fish and Game (ADF&G) biologists conducted resource inventories that indicated harvestable surpluses of salmon were available in several river systems of Norton Sound and Kotzebue Sound. ADF&G liberalized various regulations and encouraged processors to explore and develop new fishing grounds after statehood. As a result, commercial salmon fishing activity grew significantly, enabling some local residents to obtain cash income.

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

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

- Boat (or fisher) hours have been computed after assuming that if a fishing boat delivers during a fishing period, it fished the entire period.
- The total number of individual boats delivering in any period is multiplied by the number of hours open to commercial fishing.
- Catch per fisher (or boat) hour is obtained by dividing the total fisher hours into the catch for the corresponding period of time. Total fishers (or boats) are 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 17,000 people in the area, the majority of who are Native Alaskans, residing in more than 30 small villages scattered along the coast and major river systems. Nearly all of the local residents are dependent to varying degrees on fish and game resources for their livelihood.

Subsistence fishers operate gillnets or seines in the main rivers and, to a lesser extent, in coastal marine waters capturing primarily salmon, whitefish, Dolly Varden, and inconnu (sheefish). Beach seines are used near 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 early 1960s until 1982, ADF&G conducted annual household surveys in communities with major salmon fisheries. From 1983 through 1993, budgetary restrictions made it impossible to conduct surveys in each village. For the last 10 years that these survey data are available for Norton Sound (1994-2003) the average subsistence catch was 95,344 salmon including all species (Appendix A12). The majority of salmon taken are pinks and chums.

Subsistence surveys for the Kotzebue area are less complete. An expansion of documented surveys from 1995-2001 for different villages estimates total subsistence salmon harvest for Kotzebue Sound area to be 74,151 annually (Appendix C5).

Since 1974, subsistence salmon catches in Nome Subdistrict (Subdistrict 1) have been determined from return of catch reports 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, ADF&G 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 2004, ADF&G continued its subsistence salmon harvest assessment program. Household surveys were conducted in two communities in Norton Sound District and six of fifteen Kotzebue District communities. In Kotzebue, subsistence salmon harvests were determined in conjunction with a big game harvest survey. In the northeastern Norton Sound and Port Clarence areas, harvests were determined through fishing permit catch reports. In the eight surveyed communities, surveyors attempted to contact 100 percent of the households. Results of the surveys in the Kotzebue District for 2004 are not available for this report.

Goals of the postseason household survey:

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

Management

Division of Commercial Fisheries of ADF&G is responsible for the management of commercial and subsistence fisheries in this vast area. Permanent full-time staff assigned to this area during 2004 consisted of an Area Management Biologist, and Area Research Biologist, two Assistant Area Management Biologists, an Assistant Research Biologist and the Fish and Game Program Technician 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 2004, 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) and one project operated by the Unalakleet IRA in Norton Sound supplemented salmon escapement monitoring activities of the area staff.

The main objective of ADF&G's program is to manage 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.

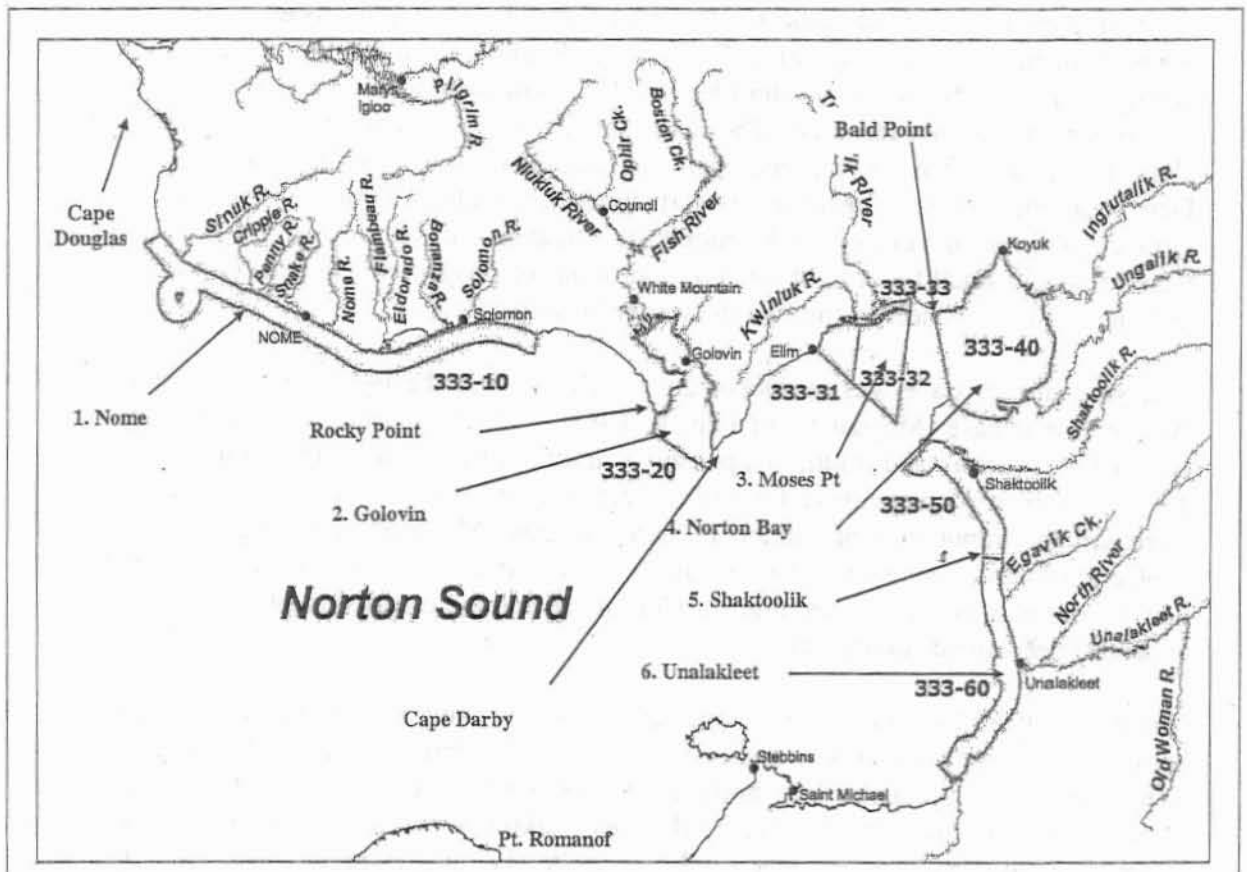
Management of the salmon fishery is complicated by the difficulty in obtaining accurate escapement data and by insufficient comparative catch and return information. Management problems are compounded by the need to provide not only for adequate escapements, but also for needs of several different user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

The basic regulation that governs commercial salmon harvest in all districts is the scheduled weekly fishing period. Commercial fishing regulations provide for up to four days of fishing per week during the open season depending on area and season differences. ADF&G attempts to distribute fishing effort throughout the entire return to avoid harvesting only particular segments of the return. Occasionally, fishing time is increased or decreased by emergency order. Managers issue these orders depending upon fishing conditions and strength of runs or spawning escapements, as determined by evaluation of available run timing and abundance indicators. Weekly fishery reports, which give information on fishery status and fishing schedules, are broadcast during the fishing season over radio KICY and KNOM in Nome, and KOTZ in Kotzebue. Fishery news articles are published in the Nome Nugget and the Arctic Sounder.

NORTON SOUND DISTRICT

District Boundaries

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



Map 1. Commercial salmon fishing subdistricts and statistical areas of Norton Sound.

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

Salmon management changed significantly during recent years because of limited market conditions and marginal returns of many salmon stocks within the district. There has been no commercial interest in pink salmon since 2000. Except for Nome Subdistrict, commercial fishing can occur if salmon runs are sufficient and a commercial market opens. Commercial fishing managers use estimates of run strength from escapement counting projects, test fishing, aerial surveys, and commercial fishing CPUE. Nome Subdistrict is managed intensively for subsistence use. Tier II chum salmon subsistence permits, registration permits, closed waters, setting fishing period length, limiting gear, and harvest limits are all tools that can be employed throughout the season to provide for escapement needs and to maximize subsistence opportunity.

Historical Fishery Use

Archeological evidence dating back 2,000 years indicates fishing has been a part of life for Norton Sound residents for many centuries (Bockstoce, 1979). The largest pre-contact settlements on the Bering Strait Islands and the Western Seward Peninsula were located where marine mammals were the primary subsistence resource. The rest of the region's population lived in small groups scattered along the coast, often moving seasonally to access fish and wildlife resources (Thomas 1982). During summer months, residents would disperse usually in groups comprised of one or two families, and set up camps near the mouths of streams. Harvest levels of fish on any one stream were relatively small because of 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 and Punguk 1981). These activities and support for hundreds of commercial whalers and trading ships caused trading to increase in the region around 1848 (Ray 1975). Increased competition for walrus, caribou, and other species from outsiders may have increased the importance of salmon to area residents (Magdanz and Punguk 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 and the establishment of missions drew people to central year-round communities.

Mining impacted fish populations significantly. Nearly every stream on the Seward Peninsula had some sort of mining operation working on it which ranged from simple gold panning to sluice boxes to hydraulic giants to bucket line dredges. One example of extensive impact is the Solomon River, which is only 30 miles long but had 13 dredges working at one time. Another obvious impact was simply the large number of people who came to live in the region between 1900 and 1930. Communities like Nome, with a population of 30,000 and Council once with 10,000 people did not exist before gold was discovered.

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

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

The number of people gradually decreased over the next twenty years after the gold rush and the gold deposits were worked out. The number of dog teams diminished by the mid 1930s when mail planes and mechanical tractors were introduced. The last dog team mail contract ended in 1962 at Savoonga. Local stores continued to trade and barter in dry fish at Shaktoolik, Saint Michael, Unalakleet, and Golovin. An example of quantity was the 8x20x40 foot cache at the Shaktoolik store filled to the top with dry fish. One elder said the stores would buy the fish for 6 cents a pound and sell them for 10 cents a pound or their equivalent in groceries and supplies (Thomas 1982). By the early 1960s, commercial salmon fishing developed into a source of summer cash and snowmachines were replacing the need for dog teams. 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 Norton Sound District first began in the Unalakleet and Shaktoolik Subdistricts in 1961. Most of the early interest involved Chinook and coho salmon flown in dressed condition to Anchorage for further processing. A single U.S. freezer ship purchased and processed chum and pink salmon during 1961. In 1962, two floating cannery ships operated in the district and commercial fishing was extended into Norton Bay, Moses Point, and Golovnin Bay. The peak in salmon canning operations occurred in 1963.

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

The commercial salmon fishing season usually opens by emergency order between June 8 and July 1, but depends 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 before regulatory closure dates. Up to two 48-hour fishing periods can occur each week unless changed by emergency order, with exception of the Moses Point Subdistrict, where two 24-hour fishing periods can be scheduled each week. No commercial salmon periods have occurred in the Nome Subdistrict since 1996 because of low fish runs or, in the case of pink salmon, no market.

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

Commercial Fishery Management

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

Aerial surveys are used to monitor escapements in most Norton Sound streams. Weather conditions, time of day, type of aircraft, water conditions, bottom conditions, date of survey, and efficiency of surveyor and pilot must be taken into account when making inter-annual aerial survey comparisons. Counting towers and weirs are a more consistent and accurate method of obtaining escapement information and have been utilized on several river systems in Norton Sound. Three counting towers and four weirs were operated in 2004.

Management emphasis is on Chinook salmon during June switching to chum salmon around July 1, and then gradually shifting to coho salmon during the fourth week in July. Pink salmon are abundant in July during even numbered years, but often no market is available for this species. Southern Norton Sound, Subdistricts 5 and 6 (Shaktoolik and Unalakleet), have maintained commercial fisheries that target Chinook, chum, and coho salmon. Coho salmon catches have remained fairly stable while Chinook and chum salmon catches have been declining since the late 1990s. Management has consisted of a series of emergency orders that open and close fishing seasons and periods, adjust fishing time, and specify mesh size.

Commercial fisheries in Subdistricts 2 and 3 (Golovin and Moses Point) target chum salmon and during even numbered years, pink salmon. In some years there has been one or two commercial fishing periods for Chinook salmon in Subdistrict 3. Commercial chum salmon harvests have dropped dramatically since the mid-1980s in both Subdistricts. Poor chum salmon runs have resulted in restrictive management actions during recent years. Commercial fishing seasons have been closed by emergency order to allow for escapement and subsistence uses.

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

Subsistence Fishery Overview

Household subsistence harvest surveys were not conducted district wide in Norton Sound from 1983 to 1993 because of budgetary restrictions. From 1994 through 2003, ADF&G conducted an annual subsistence salmon harvest assessment effort in northwest Alaska to provide more extensive, complete, and reliable salmon harvest estimates than previously existed. These household subsistence harvest surveys were primarily funded by the Commercial Fisheries Division and were conducted by the Division of Subsistence during fall in eight Norton Sound villages. In 2004 a subsistence permit was required in most of northern Norton Sound and surveys were conducted in Shaktoolik and Unalakleet.

Daily surveys of selected 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 run. The commercial fishery is delayed until it becomes apparent subsistence uses are being met and Chinook salmon are beginning their upstream migration as indicated by the ADF&G test net in the lower Unalakleet River. Since the early 1990s some subsistence nets are fished in the ocean to avoid large debris loads from spring runoff.

Low salmon stock levels in Nome Subdistrict combined with a large concentration of users resulted in subsistence harvest permits being required since 1974. Permits are issued by regulation to each household, and each designated fishing location may have its own catch limit. After the fishing season, households are required to return the completed permit to ADF&G, whether or not they actually fished. In 2004 the permit system was extended to the Moses Point and Golovin Subdistricts, and the Port Clarence District.

Regulatory Actions in Subdistricts 1, 2 and 3

Subdistrict 1 has been the focus of most regulatory actions within the Norton Sound District since the 1970s. 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. Relatively large chum salmon catches in this subdistrict in conjunction with weak local abundance implied the fishery intercepted non-local stocks. A 1978-79 Norton Sound stock separation study confirmed this view. Salmon tagged near Nome were re-captured in fisheries from Golovin (Subdistrict 2) to Kotzebue. In an attempt to provide for spawning requirements and to provide for an important subsistence fishery that targets local stocks, a commercial harvest guideline of 5,000-15,000 chum salmon was adopted as a regulation.

The Board of Fisheries, in response to an advisory committee petition, directed ADF&G to manage Subdistrict 1 commercial fishery for optimal chum salmon escapement after poor chum salmon escapements during the 1982 and 1983 seasons. During 1984 fall Board of Fisheries meetings, directives in practice that season became regulation. In response to public and advisory committee 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.

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

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

Subsistence permit limits in 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.

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

At that time, with the Nome Subdistrict commercial fishery all but eliminated, proposals affecting 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 of which may be chum salmon and coho salmon, in combination.

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

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

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

2) Nome River was added to 5AAC 01.170 (e) 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 expanded the 1987 regulations above to include all of Nome Subdistrict, but, in 1995, regulations changes allowed 300 feet of gillnet in the marine waters of

Nome Subdistrict. Also in 1992, managers were given authority to permit 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. However, since 1999, beach seines were used to harvest abundant species, and allow live release of other species experiencing depressed runs.

Nome Subdistrict was designated a Tier II subsistence chum salmon management fishery during a special meeting by the Alaska Board of Fisheries held in Nome, March 1999. Tier II permits are dispensed to individuals by fishing history, dependence, and projected harvestable surplus. Through a series of Board of Fisheries directed meetings, the Board concluded the previous management plan did not provide adequate opportunity for all subsistence salmon users to supply their annual needs for chum salmon. As a result, the Board allocated a subsistence priority to twenty individuals who applied and qualified for Tier II permits. The intent was to allow up to 30 Tier II permit holders first priority over other subsistence users if only a small harvestable surplus of chum salmon return. If the run was assessed to be strong, then the subsistence fishery would open to all Alaskan residents who obtain a Tier I registration permit and individual harvests would be restricted to prescribed permit limits. In addition, the Board established "Closed Waters" areas, where no subsistence salmon fishing would be allowed at any time, to protect chum salmon on the spawning grounds and placed existing chum salmon aerial survey escapement goals for six Nome Subdistrict streams into regulation.

During a Board of Fisheries work session in September 2000, two Norton Sound District chum salmon stocks were determined to be stocks of concern based on the Policy for the Management of Sustainable Salmon Fisheries. Nome Subdistrict chum salmon were determined to be a stock of management concern and Golovin and Moses Point Subdistricts chum salmon were determined to be a stock of yield concern.

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

The Board repealed the existing Biological Escapement Goals (BEG) in regulation and adopted Optimal Escapement Goals (OEG) for chum salmon for five Norton Sound rivers. In the past, escapement goals were expressed as aerial survey counts of salmon. Aerial surveys do not count all salmon present, but serve as an index to compare current and previous surveys. New OEG's are in actual number of fish and based on ADF&G escapement goal analysis (Clark 2001). Four

of five OEG's were established for rivers where an escapement project (tower or weir project) is operated. The Board-established OEG's, by subdistrict:

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 adopted a chum salmon management plan for Subdistrict 1 and a salmon management plan for Subdistricts 2 and 3. Commercial chum salmon fishing in Nome Subdistrict was closed and the fishery may not be reopened again until the abundance of chum salmon has a harvestable surplus large enough to meet subsistence needs for four consecutive years.

ADF&G was given 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 Cripple and Penny Rivers to subsistence fishing for chum salmon. Also, Nome and Solomon Rivers were closed to subsistence fishing for Arctic grayling, where abundance was determined to be low.

2004 Norton Sound Salmon Fishery

Commercial Fishery Summary

The 2004 Norton Sound commercial salmon season was an improvement over the previous three seasons. The Chinook salmon run has been consistently weak since the late 1990s and was poor again this year. There were no commercial Chinook salmon fishing periods in the Shaktoolik and Unalakleet Subdistricts and for the second year in a row and there were subsistence restrictions on the Unalakleet River. The chum run in the Shaktoolik and Unalakleet Subdistricts was average, but there has been little interest in commercial chum salmon fishing. The pink salmon run was a record, but there has been no buyer interest in pink salmon since 2000. An average coho salmon run in eastern Norton Sound allowed for the normal commercial fishing schedule of two 48-hour periods per week from late July until early September in the Shaktoolik and Unalakleet Subdistricts, and the commercial coho harvest for those subdistricts was the third highest in ten years.

The first commercial opening occurred in the Moses Point Subdistrict for Chinook salmon in early July, but there was no commercial fishing effort. Elsewhere in Norton Sound the Chinook salmon run was too weak to allow for commercial fishing. The commercial coho season opened the week of July 26 in the Shaktoolik and Unalakleet Subdistricts. Good catches in the commercial fishery, good catches at the test net, and high passage of coho salmon at the North River tower allowed for commercial fishing to continue on the normal schedule of two 48-hour periods per week until September. The number of commercial permits fished in Norton Sound was the third lowest and

the combined commercial harvest of all salmon species was the sixth lowest on record (Appendix A1 and A2).

Average price paid for sockeye salmon was $.40 per pound, $.39/lb for coho, and $.14/lb for chum salmon (Appendix A3). Total value of raw fish reported on fish tickets in 2004 was $122,705 (Appendix A4). This amount was 75% above the previous 5-year average and 45% below the 10-year average). Historical commercial catch weight by species and mean weight by species are shown in Appendix A4 and Appendix A5. The 2004 fishery value was the eighth lowest since the 1960s.

Table 1 lists the 2004 Norton Sound commercial salmon harvest by subdistrict. Comparisons to the 5-year and 10-year averages are shown in Appendix A2. The coho salmon harvest of 42,016 was over twice the recent 5-year average, and 12% above the recent 10-year average. There were no Chinook, pink, or chum salmon directed periods and harvest of these species was incidental to the coho fishery. The chum salmon run to eastern Norton Sound Subdistricts 5 and 6 was below average. The chum salmon commercial harvest of 6,296 was 7% above the 5-year and 61% below the 10-year averages. The low total harvest of 48,352 salmon can be attributed to low salmon runs and low participation by permit holders. Only 36 permit holders participated in the commercial fishery and only 2002 and 2003 had a lower participation when 12 and 30 permit holders fished respectively. The previous 5-year average resulted from 46 permits fished, and the previous 10-year average resulted from 73 permits fished.

Only one salmon buyer operated in Norton Sound during the 2004 season. The Unalakleet fish plant operated by Norton Sound Seafood Products was the base of commercial fisheries operations. Salmon were delivered to the Unalakleet dock and tendered from neighboring Shaktoolik Subdistrict.

Subsistence Fishery Summary

The 2004 pink salmon run ranged from very good to record levels in most areas of Norton Sound. There were closures to the subsistence fishery for Chinook, chum and coho salmon in particular subdistricts of Norton Sound. Subsistence closures occurred in the Unalakleet River for Chinook salmon. Tier II chum fishing restrictions occurred in the Nome Subdistrict and there were closures in some rivers. Subsistence fishing was reduced to two days a week in late August and through September to protect coho salmon in the Fish and Niukluk River drainages. Also, Anvil Creek, a tributary of the Snake River, in the Nome Subdistrict was closed to salmon fishing in August and September to protect spawning coho salmon. In previous years Anvil Creek has been over fished because of its small size, proximity to the road system, and a small coho salmon run.

Household subsistence surveys were eliminated from the budget in 2004, except for Shaktoolik and Unalakleet. Subsistence salmon fishers in the Port Clarence District and Subdistricts 1 – 3 (Nome, Golovin, and Moses Point) were required to possess a subsistence permit for each household that fished in these locations. These permits identify the type of gear used, and the harvest limit, which is specific to that body of water. In addition, the permit contains a catch calendar where the permit holder records catches in numbers of each species of fish for each day fished. If the subsistence fishers have filled their harvest limit in one river they can fish in another

river. The household harvest limit in marine waters of the Nome Subdistrict is 200 salmon per year of which no more than 50 can be chum salmon. In the Pilgrim River drainage the harvest limit is 60 salmon of which no more than 50 can be sockeye salmon. In 2004 the harvest limits on pink and sockeye salmon were waived in the Nome Subdistrict. The limits for pink and sockeye salmon were waived in the Pilgrim River when using a seine or rod and reel, but remained if a gillnet was used. The gillnet restriction was kept to encourage other gear type use and allow for the release of Chinook and coho salmon because each has a season limit of 10 per household. Subsistence permits are important to management because they identify users and harvest limits, but the actual catch information can not be compiled until well after the season when the permits are returned to the Department of Fish and Game. Catch information for 2004 is presented in Tables 2 and 3.

The Board of Fisheries designated Nome Subdistrict as a Tier II chum salmon fishery in 1999. 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. In 2004, 57 fishers applied for a Tier II permit. After scoring the applications a subsistence priority went to 50 households who applied and qualified for the limited Tier II permits based on fishing history, dependence, and the projected harvestable surplus. In the five previous years of the Tier II fishery at least 7 permit holders did not fish each year even when only 40 permits applicants qualified to fish. Therefore, the department allowed all 57 applicants to receive a permit. From the 57 eligible applicants there were 52 Tier II permits issued. The other 5 eligible applicants never picked up their permit.

The intent was to allow Tier II permit holders first priority over other subsistence users should only a small harvestable surplus of chum salmon return. If the run was assessed to be strong, the subsistence fishery would open to all residents of Alaska who obtain a subsistence salmon fishing permit and individual harvests would be restricted to prescribed bag limits as stated above.

Season Summary by Subdistrict

Nome - Subdistrict 1. The commercial salmon season in Nome Subdistrict is scheduled to take place by regulation between July 1 and August 31. However, at the January 2001 Board of Fisheries meeting, commercial fishing for chum salmon was indefinitely closed and will be reopened only after the harvestable surplus of chum salmon has met Tier I subsistence needs for four consecutive years. No commercial salmon harvest was taken because of lack of buyer interest in pink salmon and inadequate surpluses of coho salmon (Appendix A6). Commercial fishing in the subdistrict is typically very limited because local salmon stocks are not abundant and subsistence demand is high. In 2004, 52 Tier II permits and 440 Tier I (including areas near Subdistrict 1) subsistence fishing permits were issued (Tables 2 and 3). Some individuals were issued both permit types and multiple permits for different fishing locations.

As normal, subsistence fishing was closed by emergency order, in mid-June, prior to the beginning of the chum salmon run, to all Tier I fishers and Tier II fishers. One change this year was that although subsistence fishing was closed on June 15, it reopened to Tier II fishing that same evening at 6 p.m. for the weekly Tier II fishing period of 72 hours, from 6 p.m. Tuesday until 6

p.m. Friday, in the marine waters east of Cape Nome. In previous years all subsistence fishing was usually closed until the last week in June and then the Tier II weekly schedule of 72 hours per week in the marine waters east of Cape Nome went into effect. On June 22, all fresh water subsistence areas, except for the Cripple and Penny Rivers, opened to Tier I subsistence rod and reel fishing for pink salmon. In late June, net fishing for Tier II fishing was allowed in the Eldorado, Flambeau and Sinuk River subsistence areas for two 48-hour periods weekly and on July 1 all fresh waters east of Cape Nome were opened to Tier II fishing. Also, on July 1 all waters of the Nome Subdistrict were open to rod and reel fishing to target the large run of pink salmon entering all rivers and all pink salmon limits were waived when subsistence fishing. The first Tier II period in the marine waters west of Cape Nome was for 48-hours from July 1 to July 3. Beach seining was allowed in most rivers of the Nome Subdistrict beginning on July 5. By mid-July the pink salmon run was obviously going to be a record run and subsistence fishing was allowed throughout the Nome Subdistrict. The chum salmon run was also projected to reach the goal in the Nome Subdistrict of 23,000 to 35,000 fish and Tier II fishing was allowed in all chum salmon subsistence areas the second half of July, except for the Eldorado and Solomon Rivers. The Eldorado and Solomon Rivers were projected to not reach chum salmon escapement goals and those rivers were closed to chum fishing. The Penny and Cripple Rivers are closed in regulation to chum salmon fishing, but both rivers were open to subsistence fishing for pink salmon. Tier I chum salmon fishing was allowed in rivers that met escapement goals. On July 26, the subdistrict reopened in both marine and fresh waters to all Tier I and Tier II fishers to target coho salmon. A very good coho salmon run allowed the subdistrict to remain open. Anvil Creek, a tributary of Snake River was closed to protect spawning coho salmon.

Nome Subdistrict reported subsistence harvest by Tier I and Tier II permit holders was 100 Chinook, 106 sockeye, 1,574 coho, 15,047 pink and 685 chum salmon (Tables 2 and 3). The subsistence pink salmon harvest was the second highest reported in Nome Subdistrict in 20 years (Appendix A6). Subsistence permits were issued at Cape Woolley, north of the Nome Subdistrict, for the second consecutive year and the reported harvest was 30 sockeye, 8 coho, 202 pink and 60 chum salmon (Table 2).

Golovin - Subdistrict 2. The Subdistrict 2 and 3 Salmon Management Plan limits the Golovin Subdistrict commercial harvest 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.

However, there was no commercial chum salmon fishing in Subdistrict 2 as it was questionable whether chum escapement goals would be reached in the Subdistrict (Appendix A7). The Niukluk and Fish River drainages had sport chum salmon fishing closed in mid-July because of a weak chum salmon run. Subsistence fishing was not closed because of the large pink salmon run would have made it difficult for subsistence fishers to target chum salmon. In mid-August, coho escapement became a concern in the Fish and Niukluk River drainages. By late August it was obvious the run was extremely poor and sport salmon fishing for coho salmon in the Fish and Niukluk River drainages was closed until October and subsistence fishing was reduced to two 24-hour periods per week until October.

This was the first year that subsistence salmon permits were required and 195 permits were issued for Subdistrict 2. The reported subsistence harvest was 164 Chinook, 6 sockeye, 652 coho, 19,886 pink and 874 chum salmon (Table 2).

Moses Point - Subdistrict 3. The Moses Point Subdistrict chum salmon run was poor and Kwiniuk River did not reach the escapement goal range of 11,500 to 23,000 fish. However, all goals were reached for other salmon. In 2004, the escapement past the Kwiniuk tower was 645 Chinook salmon, 10,371 chum salmon, 3,045,915 pink salmon, and 10,523 coho salmon. The Chinook salmon estimate was above the escapement goal range of 300-550 fish and the pink salmon escapement was the largest recorded in the 40-year history of the Kwiniuk River tower. Coho salmon have only been enumerated for 4 years at Kwiniuk River tower and this year was the largest escapement recorded. There was no commercial harvest in Subdistrict 3 although there was one opening for Chinook salmon (Appendix A8). In recent years with declining fish prices and other work opportunities in the area there has been little interest in fishing.

This was the first year that subsistence salmon permits were required and 61 permits were issued for Subdistrict 3. The reported subsistence harvest was 411 Chinook, 694 coho, 7,858 pink and 683 chum salmon (Table 2).

Norton Bay - Subdistrict 4. Norton Bay Subdistrict typically has difficulty attracting a buyer because of its remoteness and its reputation for watermarked fish. Consequently, regulatory changes were implemented to move the western boundary from Six Mile Point to Isaac's Point in 1995 and eastern boundary out to Point Dexter in 1998 to improve fish quality. Because of lack of timely salmon escapement information, Norton Bay Subdistrict is typically managed similar to Shaktoolik and Unalakleet Subdistricts because they reflect similar trends in salmon return strength and timing. In 2004, no commercial salmon fishing occurred because of poor salmon runs and no buyer interest (Appendix A9). There were no subsistence salmon surveys done in Subdistrict 4 in 2004.

Shaktoolik and Unalakleet - Subdistricts 5 and 6.

Shaktoolik and Unalakleet Subdistricts, which share a common boundary, consistently attract commercial markets because of large volumes of fish and better transportation services. Management actions typically encompass both subdistricts because salmon tend to intermingle and harvest in one subdistrict affects movement of fish in the adjacent subdistrict. The ADF&G test net in Unalakleet River and subsistence interviews at Unalakleet are used to set early fishing periods in both subdistricts. As the season progressed, test net catches, commercial catch indices, and the North River counting tower were used to assess run strength of each salmon species. Aerial surveys are frequently not obtained in either subdistrict because of poor survey conditions and are only useful for late season escapement assessment because of the long travel time between fishery and spawning grounds.

Commercial fishing is typically only allowed after Chinook salmon have been observed entering Unalakleet River in increasing numbers for a week to assure harvest is directed on actively migrating stock and not on milling fish. In 2004, the Chinook salmon run was weak as determined by subsistence net catches, test net catches, tower counts, and aerial surveys (Tables 4, 5, and 6).

The chum run was average, but there has been little market interest in chum salmon. Therefore, there were no Chinook or chum salmon directed commercial fishing periods. In addition, concerns with the Chinook run resulted in the Unalakleet River drainage being closed to all Chinook salmon fishing for two weeks in July. Beach seining was allowed for pink and chum salmon.

During the third week of July, test net catches of coho salmon were at record levels. Once the buyer was ready the department opened commercial coho fishing on July 26 to the regular schedule of two 48-hour periods per week for the remainder of the season. The season closed by regulation after September 7, but there was no buyer for the last 48-hour period. The buyer indicated a lack of market for the increasingly blushed coho salmon in the catch.

The 2004 commercial catches in the Shaktoolik Subdistrict included 1,372 chum and 12,734 coho salmon harvested by 11 permit holders (Tables 1 and 5). The coho salmon harvest was almost triple the recent 5-year average and 76% above the recent 10-year average (Appendix A10).

The Unalakleet Subdistrict total commercial catch harvested by 25 permit holders included 40 sockeye, 29,282 coho, and 4,924 chum salmon (Table 1 and 6). There were 22 Chinook, 7 sockeye and 1 chum salmon reported caught, but not sold. Salmon caught, but not sold are assumed to be used for subsistence purposes. The coho salmon harvest was double the recent 5-year average and 7% above the recent 10-year average (Appendix A11). Commercial, subsistence, and sport harvests for all subdistricts since 1961 are shown in Appendix A12.

Subsistence salmon surveys were conducted in Shaktoolik and Unalakleet by Commercial Fisheries Division personnel. The reported Shaktoolik subsistence harvest was 786 Chinook, 10 sockeye, 1,663 coho, 6,076 pink and 219 chum salmon (Appendix A10). The reported Unalakleet subsistence harvest was 2,255 Chinook, 276 sockeye, 5,307 coho, 17,969 pink and 1,174 chum salmon (Appendix A11).

Escapement

Table 4 and Appendix A14 summarize escapement assessments for major index river systems of Norton Sound and Port Clarence Districts. These assessments are often qualitative and relative to historical escapement sizes. Most chum salmon assessments are described relative to a Sustainable Escapement Goal (SEG) for an index area. A SEG is a level of escapement known to provide for sustained yields over a 5-to-10 year period, and is used in situations where a Biological Escapement Goal (BEG) cannot be estimated because a stock specific catch estimate is absent. A BEG is based on spawner-recruit relationships estimated to provide maximum sustained yield. The more formalized BEG has been established for the Nome Subdistrict chum salmon stock. SEG's have been established for seven of nine individual streams in Nome Subdistrict based on historical average proportion of each stream's contribution to the composite Nome Subdistrict chum salmon escapement. For Nome Subdistrict streams that do not have an escapement counting project, SEG's are in expanded aerial survey counts. BEG's have also been established for chum salmon stocks that return to Kwiniuk and Tubutulik rivers. At the January 2001 meeting the Board of Fisheries established Optimal Escapement Goals (OEG) for Eldorado, Nome, Snake, Kwiniuk,

and Tubutulik rivers in Norton Sound District. An OEG is a specific management objective for escapement that includes biological and allocative factors and may differ from the SEG or BEG.

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

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

Aerial survey assessment conditions were fair to good in most subdistricts for 2004. However, the large number of pink salmon in the escapement prevented chum salmon from being observed in most rivers. As usual, Nome Subdistrict streams received the most intensive assessment efforts because salmon stocks local to the Nome area are strictly regulated, easily accessed by road system, and are exposed to intense subsistence and sport fishing pressure.

Chinook Salmon. The 2004 Chinook salmon run was poor throughout most of eastern Norton Sound, but was nearly average in northern Norton Sound. In Norton Sound only the eastern area has sizable runs of Chinook salmon and rivers in the Unalakleet and Shaktoolik Subdistricts are the primary Chinook salmon producers in Norton Sound. The Unalakleet test net catches, the North, Kwiniuk and Niukluk towers, aerial surveys and subsistence reports were the primary assessment tools for judging Chinook salmon run strength in Norton Sound. The Unalakleet test net catch was approximately 70% below average and the North River tower was also well below average, and this was the first year the minimum goal was not reached in the North River since 2000. Aerial surveys escapement goals on the Unalakleet, Shaktoolik and Fish Rivers were not reached. For the second year in a row there was no commercial Chinook salmon fishing in the Shaktoolik and Unalakleet Subdistricts and Chinook salmon fishing was closed in the Unalakleet River drainage. Subsistence fishers in the Shaktoolik and Unalakleet Subdistricts reported that it required much longer than normal to reach their Chinook harvest goal and fishing was poor compared to most years. The escapement of Chinook past the Kwiniuk and Niukluk River towers and the Pilgrim River weir was average to above average although the Chinook salmon runs are much smaller in those rivers compared to the Shaktoolik and Unalakleet River drainages.

Chum Salmon. Chum salmon escapements ranged from below average to above average in 2004. The below average escapements tended to be in northern Norton Sound and the above average escapements in eastern Norton Sound. Counting conditions were good at the Nome Subdistrict projects and chum salmon escapement goals were achieved in two of the three rivers with established OEG's. The Nome River reached the escapement goal range of 2,900 to 4,300 chum salmon for the first time since 2000. The Eldorado River which usually reaches the escapement goal range of 6,000 to 9,200 chum salmon failed to reach the range for the second year in a row. The Snake River reached the escapement goal range of 1,600 to 2,500 chum salmon for the fourth year in a row. 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 2004 was the lowest on record and approximately half of the previous low record in 2003. The Kwiniuk River tower in the Moses Point Subdistrict had a chum salmon count that was the fourth lowest in the 40-year history of the project and fell short of the low end of the escapement goal range (11,500 – 23,000). An aerial survey of the Tubutulik River was conducted, but cannot be used to judge whether the BEG was met because of the large numbers of pink salmon in the river. The Unalakleet River chum escapements were above average based on test net catches and the North River chum escapements were above average based on 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 under better conditions. The more recent Norton Sound escapement assessment projects are intended to monitor coho salmon as well as chum salmon and are becoming more important to fisheries management. The 2004 coho salmon escapements in Norton Sound were well above average in all areas except for the Golovin Subdistrict. The below average run on the Fish and Niukluk Rivers in the Golovin Subdistrict continued the pattern of below average runs in recent years. Subsistence and sport fishing restrictions were implemented in the Fish and Niukluk River drainages, and Anvil Creek in the Nome Subdistrict. In the Unalakleet River the cumulative test net catch was a record for the 20-year history of the project and more than triple the historical average. Almost all projects in Norton Sound were not able to count during a high water event in August and counting was suspended for 3 to 10 days. Aerial surveys indicated that escapements were above average on numerous streams and aerial surveys in the Nome Subdistrict had some of the best escapement counts in years.

Pink Salmon. In the last 20 years, pink salmon returns to Norton Sound have followed an odd/even year cycle with the even-numbered year returns typically much higher in number than the odd-numbered years. In 2004, there were record escapements for a number of rivers. The Kwiniuk River tower had the highest recorded number in the 40-year counting history with over 3 million pink salmon counted past the tower. Nome River nearly tripled the escapement record with over 1 million pink salmon counted through the weir. Aerial surveys noted record numbers of pink salmon in other streams (Table 4).

Sockeye Salmon. Sockeye salmon are typically found in small numbers throughout the Norton Sound District with the largest spawning stock at Glacial Lake where approximately 1,000 to 2,000 fish return to spawn each year. Port Clarence is the salmon district immediately to the northwest of Norton Sound and has had a spawning population near 10,000 fish in past years at Salmon Lake. However, the last two years there were record runs of sockeye salmon to Salmon Lake. No commercial fishery presently occurs on Glacial Lake and Salmon Lake stocks because of their low abundance and importance to subsistence users. Salmon Lake is drained by the Pilgrim River and the last two years a record number of subsistence permits have been issued for Pilgrim River as there have been record salmon escapements. Subsistence salmon fishing is closed in Salmon Lake to protect the spawning salmon. In 2004 the sockeye runs to Glacial and Salmon Lakes were record breakers. Several aerial surveys were made of Glacial Lake with a peak estimate of 970 sockeye salmon. The estimate was within the aerial survey escapement goal of 800 to 1,600 sockeye salmon. A weir was operated by the BLM, at the outlet of Glacial Lake and counted 8,115 sockeye salmon into the lake. The weir escapement was nearly four times the previous record. The aerial survey estimate occurred much later in the year because of poor flying conditions and the survey occurred after peak spawning. Glacial Lake has very narrow areas for spawning and the spawning areas drop off to very deep water where salmon cannot be observed on a survey. Several aerial surveys were also made of Salmon Lake with a peak estimate of 23,005 sockeye salmon and an additional 2,855 sockeye salmon in Grand Central River, a tributary to Salmon Lake. The combined aerial survey escapement goal of Salmon Lake and Grand Central River is 4,000 - 8,000 sockeye salmon. The Pilgrim River weir passage was over 85,000 sockeye salmon and was nearly double last year's record passage of 43,000 sockeye salmon.

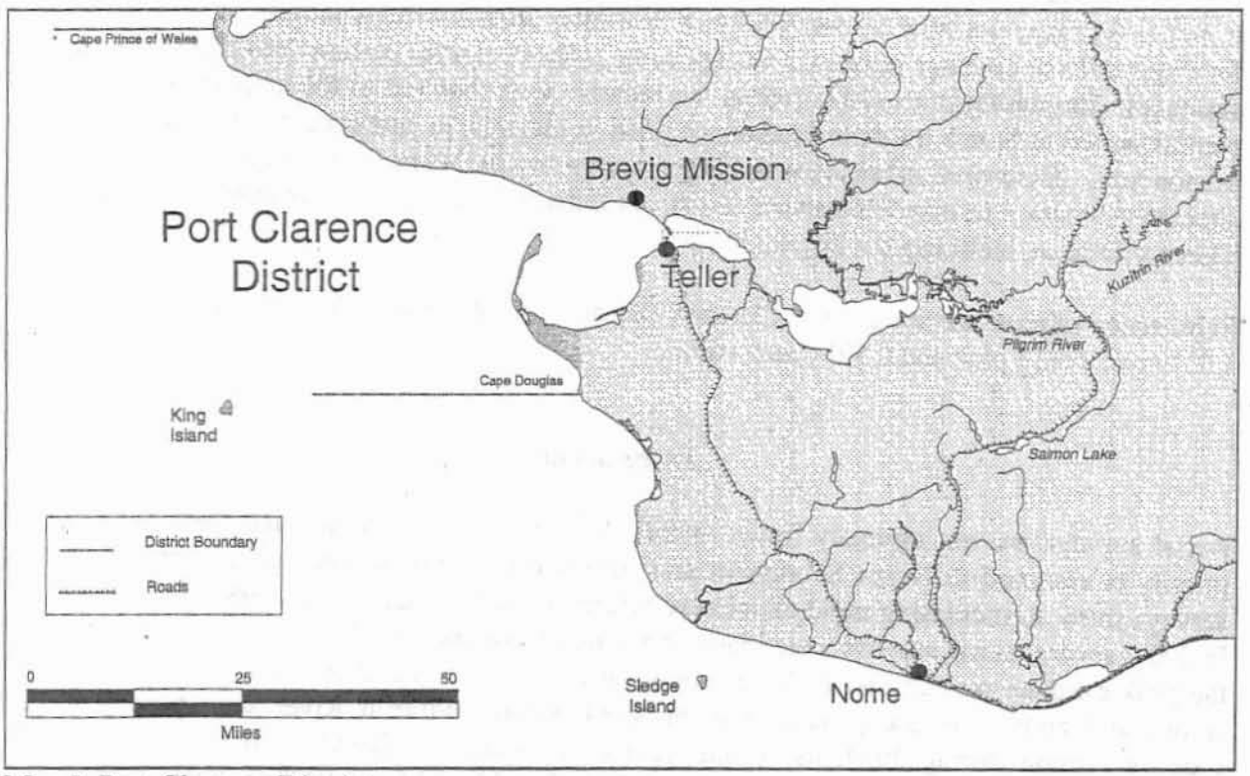
2005 Norton Sound Salmon Outlook

Salmon outlooks and harvest projections for the 2005 salmon season are based on qualitative assessments of parent year escapements, subjective determinations of freshwater overwintering and ocean survival, and in the case of the commercial fishery, the projections of local market conditions. The Chinook run is expected to be below average, but subsistence restrictions are not expected. Commercial fishing for Chinook salmon in the Unalakleet and Shaktoolik Subdistricts is unlikely, but there will likely be one or two periods in the Moses Point Subdistrict. The Chinook salmon harvest will likely be 100 – 1,000 fish. Chum salmon runs are also expected to be near the historical average and above average when compared to recent years. Commercial fishing is expected in the Moses Point, Shaktoolik and Unalakleet Subdistricts. The chum salmon harvest is expected to be between 15,000 and 25,000 fish depending on markets. The only expected subsistence restrictions for chum salmon will be in the Nome Subdistrict, and possibly some rivers in the Golovin Subdistrict. There has been no pink salmon buyer in Norton Sound since 2000. Last year was a record run of pink salmon and the odd-numbered pink salmon run is expected to be above average when compared to other odd-numbered years, but the run will be much smaller when compared to an even-numbered year run and no commercial pink fishery is expected. The coho salmon run in 2005 is expected to be average. The commercial harvest is expected to be 20,000 to 40,000 fish and no subsistence fishing restrictions are anticipated, except for catch limits in the Nome Subdistrict.

PORT CLARENCE DISTRICT

District Boundaries

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



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 salmon, 131 pink salmon and 922 chum salmon was taken commercially in the Grantley Harbor/Tuksuk Channel area. Some subsistence caught salmon are likely sold or bartered each year in Teller and Nome. Historically, the relatively small runs in this area and existence of a subsistence fishery have prevented reopening commercial salmon fishing.

Subsistence Fishery

A traditional subsistence salmon fishery has probably occurred within this district for centuries; however, subsistence fishing has only been reported at Salmon Lake since the 1930s and monitored at the upper Pilgrim River since 1962. Data collected by ADF&G personnel showed most fishers of Brevig Mission fish northern and northeastern sections of Port Clarence, and Teller fishers utilize Grantley Harbor and Tuksuk Channel. Interviews with local residents indicated substantial fishing effort within Agiapuk River. Village subsistence surveys had been conducted annually by the

Division of Commercial Fisheries up until 1983 (Appendix B2). Subsistence Division conducted a partial survey of Brevig Mission in 1989. ADF&G conducted full-scale household surveys of both villages from 1994-2003.

Salmon Lake and Pilgrim River stocks have been fished by Nome residents in addition to residents of Brevig Mission and Teller. The Alaska Board of Fisheries adopted a regulation in 1972 to close Salmon Lake and its tributaries to subsistence salmon fishing from July 15 through August 31 to conserve declining sockeye salmon stocks. Subsistence salmon fishing permits were only required for Pilgrim River drainage prior to 2004, but some fishers obtained permits for other Port Clarence drainages. Beginning in the 1991 season, an increase was observed in the number of subsistence permits issued to Nome residents intending to fish in the area, in part because of a strong sockeye salmon run. Extensive subsistence fishing closures in the Nome area made Pilgrim River an alternative location to meet subsistence needs. In 2004, 372 households obtained permits for Port Clarence District, including the Pilgrim River.

Subsistence salmon harvest in Port Clarence District for 2004 was 276 Chinook, 8,288 sockeye, 1,031 coho, 5,818 pink and 2,501 chum salmon.

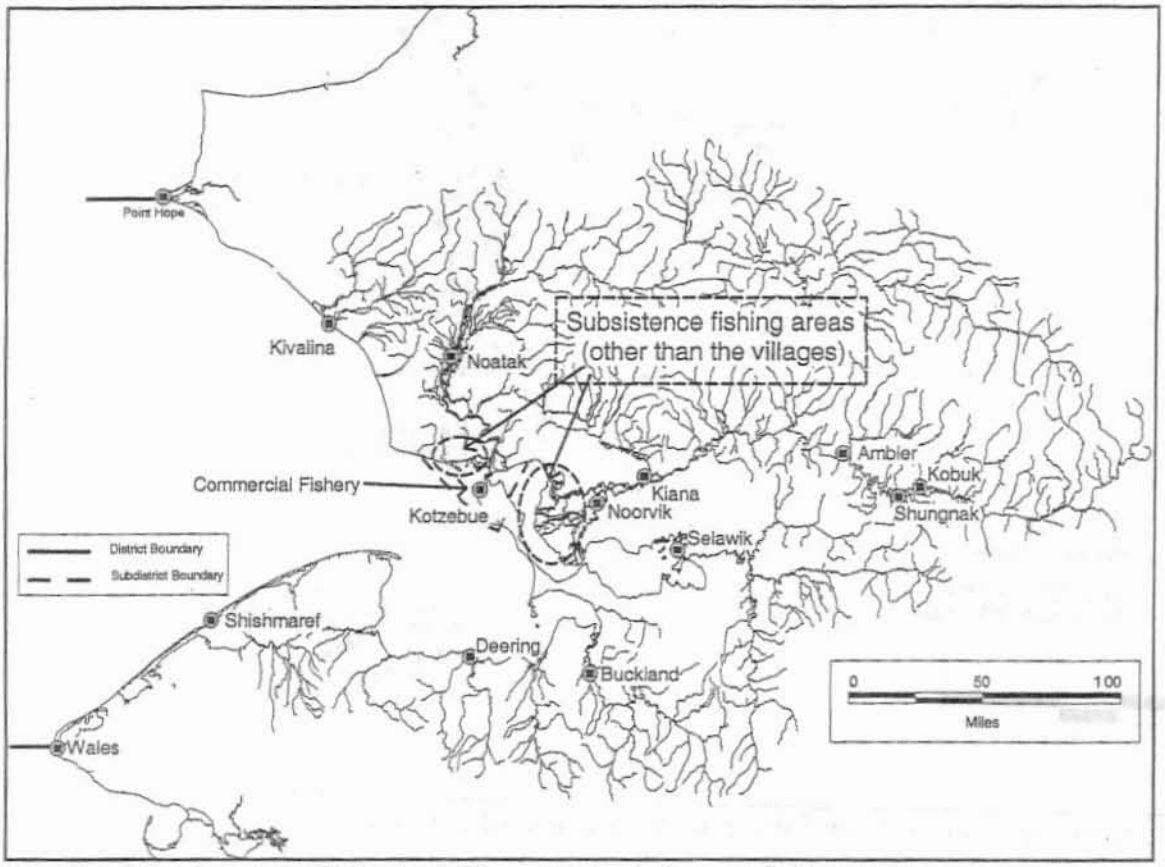
Escapement

Aerial surveys are not typically flown in this district, except Salmon Lake, because a higher priority is assigned to Nome Subdistrict and surrounding areas of commercial fishing. Aerial surveys show an increasing trend of sockeye returns to Salmon Lake since 1986 (Appendix B1). In 2004, several aerial surveys were made of Salmon Lake and its tributary Grand Central River; the peak estimate was 25,860 sockeye salmon observed on September 9, the second highest on record and above the escapement goal of 4,000-8,000. Pilgrim River weir passed 85,516 sockeye salmon during 2004, its second year of operation. ADF&G had run a fertilization program at Salmon Lake partially funded by NSEDC and BLM from 1997 to 2001. The goal of the project was to restore the sockeye population to historic levels by applying liquid fertilizer; however ADF&G could not tell if the method was effective and suspended fertilization in 2001. As a result of the 2003 returns the project was reevaluated and fertilizer was applied at a reduced rate in 2004.

KOTZEBUE SOUND DISTRICT

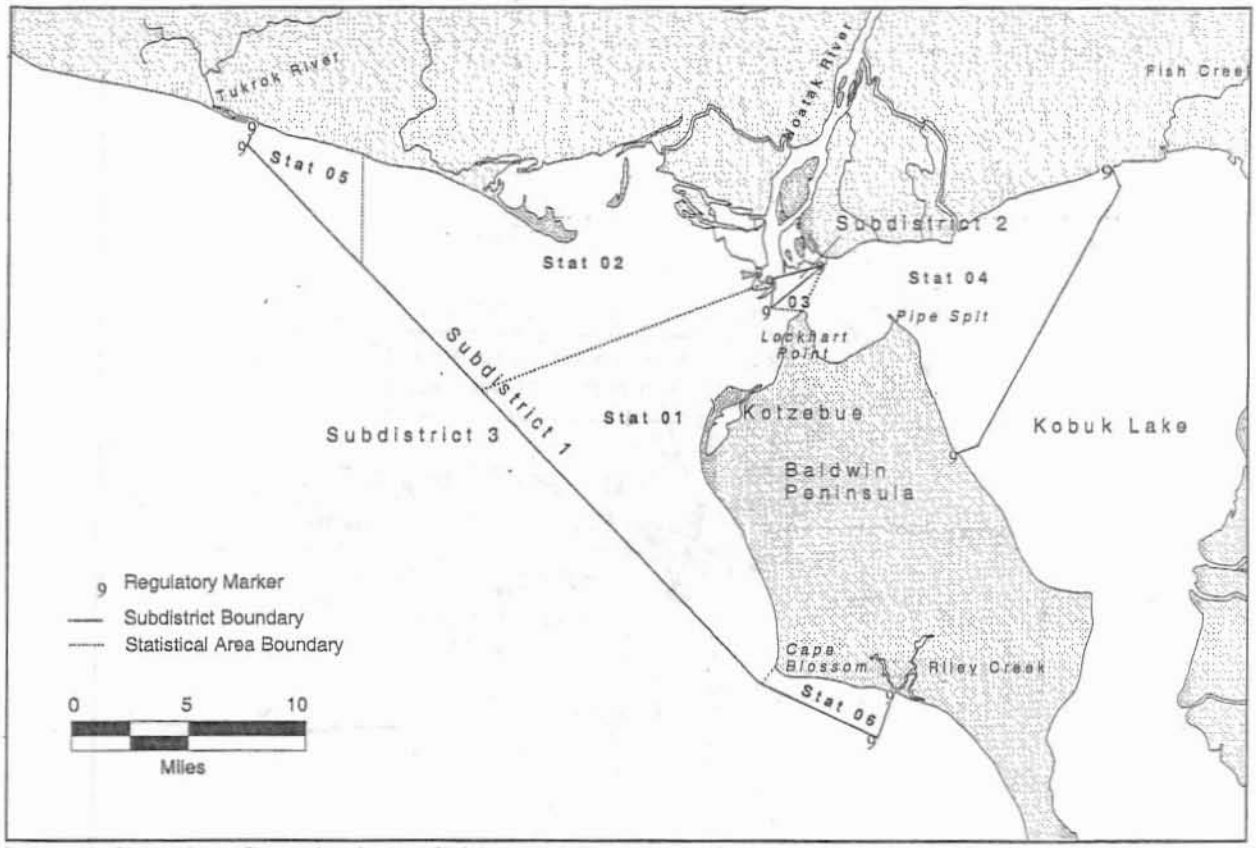
History

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



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

The commercial fishery opened under state management in 1962. Salmon harvests consist primarily of chum salmon, although limited amounts of Dolly Varden and a few Chinook salmon are harvested during the salmon fishery. Only 43 of the 183 commercial permit holders in 2004 fished. During the recent ten-year period, 1994 to 2003, participation in the fishery averaged 57 permits, and during the recent five-year period, 1999 to 2003, participation has averaged 39 permit holders.



Map 4. Kotzebue Sound salmon fishing subdistricts and statistical areas

The earliest documented sales of salmon in the Kotzebue District were in 1909 when Lockhart's store purchased 21,906 pounds of salmon from local Native Alaskans and resold it at $0.05/lb. Of those sales, 21,366 pounds were sold to gold miners on the Kobuk River drainage and 540 pounds were sold to a company in Seattle. A commercial fishery occurred from 1914 to 1918. Salmon were canned and the bulk of the harvest was thought sold to miners working in the upper Kobuk River drainage. The next organized commercial fishery began under state management in 1962 and continues to 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' new program emphasized attaining escapement goals. Before 1987, harvests were proportional to total return. Since 1995, poor market conditions caused harvests to fall short of their potential, particularly in 1995 and 1996 when resulting escapements were strong. In 2004, harvests were below potential because there was a new buyer who experienced technical problems, and escapements were below average.

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

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 or 6 in stretch mesh gillnet.

2004 Season Summary

Commercial Season Management

Primary fishery management objectives were to provide adequate chum salmon escapement through the commercial fishery to ensure a sustained run and to provide for the subsistence priority. A test fishery conducted on the Kobuk River for the twelfth consecutive year provided the only inseason escapement information. This year's test fish cumulative index ranked eighth highest. Commercial fishing time is reduced if the test fish cumulative index is projected to fall below 600 for the season, but this has not happened since the 1990s. Low participation by fishers and limited buying capacity allowed the commercial fishery to remain open continuously. The last three years the department has allowed commercial fishing continuously by having the buyer direct the periods. Age, sex and length composition (ASL) was taken from commercial catch samples, but was not used to manage the fishery. Commercial catch sample age composition was nearly 13% for age-0.2 fish and was over double the previous record.

Commercial Season Narrative

This year the Kotzebue Sound commercial fishery had an onsite buyer for the first time since 2001. Because fish were processed locally and not immediately shipped in the round as in previous years the buyer was limited in the amount of salmon that could be purchased. The department opened the fishery continuously on July 12 and let the buyer determine the fishing time for their fleet. The first two weeks the buyer instructed permit holders to fish from 6 a.m. until 6 p.m. Monday through Saturday. The third week of the season the buyer was only able to open for two days, on Thursday, July 29 and Friday July 30, for 12 hours each day because of mechanical difficulties with the ice machine. The peak catches of the season were in the first week of August and approximately 20 permit holders fished during three periods. The highest catch occurred on Monday, August 2 when nearly 5,000 chum salmon were harvested. After the August 2 period, the buyer notified all permit holders that the fishing periods would be 6 hours in duration and the periods would be every other day so the buyer could better handle the volume of fish with the limited ice supplies. After openings on August 4 and 6 the buyer went to a Monday through Friday fishing schedule of 6 a.m. to 12 p.m. for the remainder of their operations. The buyer announced that after the six-hour fishing period on Friday August 20, they would no longer purchase fish because of the increasing number of dark chums in the catch for which the buyer was having difficulty locating a market. Commercial fishing remained open through August 31 and then closed by regulation, however, there were no sales after August 20.

There were 43 permit holders who sold fish to the buyer, and there was one catcher-seller in Kotzebue who sold fish to the buyer and also sold some catch from his boat to area residents. The commercial harvest consisted of 51,077 chum salmon, 128 Chinook salmon, 124 Dolly Varden and 3 sockeye salmon (Table 7, Figure 6, and Appendix C1). The total chum harvest of

51,077 includes 39 chum salmon kept for personal use. The total Chinook harvest of 128 includes 12 Chinook salmon kept for personal use. There were likely some salmon kept for personal use that did not get reported on fish tickets. ADF&G employees noted one pink salmon in a tote of purchased chum salmon however no pink salmon were recorded on any fish tickets. The chum harvest of 51,077 was the lowest harvest since the 1960s, with the exception of the two previous years when there was not a major buyer in Kotzebue. Harvests would have been much greater if the buyer was not hampered by difficulties in obtaining an adequate quantity of ice during the peak of the run.

A total of 419,059 pounds of chum salmon (average weight 8.2 lbs) were sold at an average of $0.15 per pound. A total of 1,326 pounds of Chinook salmon (average weight 11.4 lbs) were sold at an average of $0.72 per pound. A total of 22 pounds of sockeye salmon (average weight 7.3 lbs) were sold at an average of $0.50 per pound. A total of 846 pounds of Dolly Varden (average weight 7.1 lbs) were sold at an average of $0.26 per pound (Appendix C2 and Appendix C3). The total exvessel value was $64,420 to Kotzebue area fishers with the chum salmon value at $63,225. The average value for each participating permit holder was $1,498. The total exvessel value represents 10% of the $630,285 historical average (Appendix C4).

Subsistence Season Summary

The Subsistence Division received federal funding to conduct surveys in the villages to determine the subsistence harvest of salmon. Surveys were in the fall and results will not be finalized until late winter. Historical survey results are shown in Appendix Tables C5-C7. No other information on subsistence harvest is available at this time other than comments that fishing on the Kobuk River was very slow early in the run, but better late in the run.

Escapement

A test fish project located approximately two miles downstream from the village of Kiana provided an escapement index for the Kobuk River. The test fish index of 854 was the fifth lowest in the twelve years the project has been in operation (Table 8). The midpoint of the test net catches was on August 5 and was later than any other previous year. The lowest index recorded was 494 in 1993. Aerial surveys indicated that escapement just reached the goal in the Kobuk River drainage that year. In 1993 the project started later in the season than normal and had the lowest number of test net drifts of all years. The number of test net drifts in 1993 was only 164 and the last 5 years the crew has attempted at least 200 test net drifts each season.

The Kobuk River test fish index did not follow the typical pattern in 2004. A smaller than average number of index points were generated in the first half of the season and a larger than average number of index points were generated in the second half of the season indicating a later and below average chum salmon run to the Kobuk River.

Test fishing was conducted three times during the run in the lower Noatak River by ADF&G and National Park Service personnel. Fishing was described as good on two of the three trips. Both Kobuk and Noatak River ASL samples had a record number of age-0.2 chum salmon. The percentage of age-0.2 was over 10% on both rivers, double the previous record.

An aerial survey occurred during acceptable viewing conditions on the Kobuk River and escapement goals were reached in the drainage. In the Noatak River water conditions were not suitable during the aerial survey to determine if the goal was reached. Weather and smoky conditions from Interior Alaska fires prevented surveys at other times this season (Appendix C8).

The overall chum salmon run to Kotzebue Sound in 2004 was estimated to be below average based on the low commercial harvest rates, subsistence fishers reporting lower catches than normal, and the Kobuk test fishing index being below average (Table 8 and Figure 7).

2005 Outlook

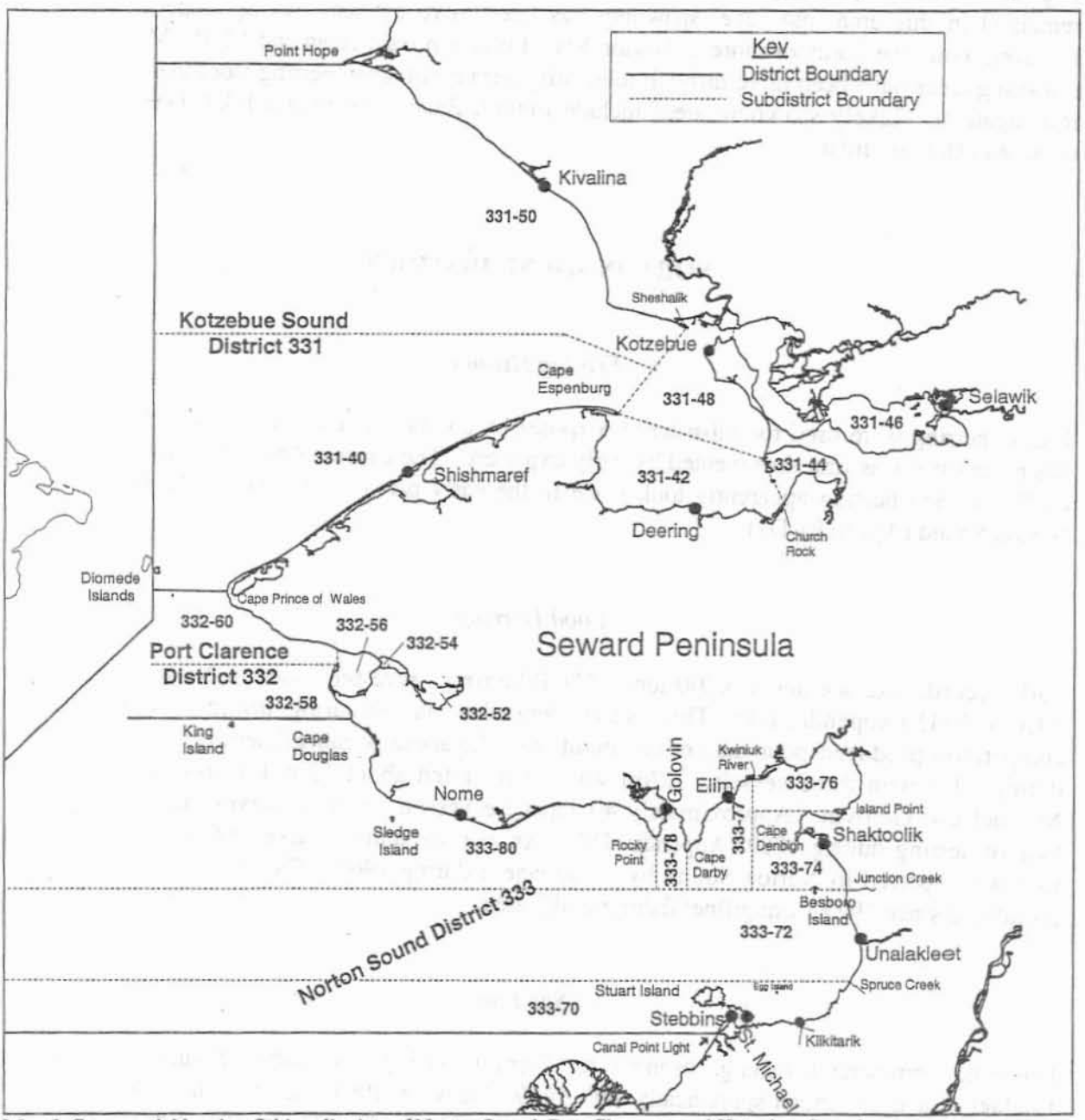
The outlook for the 2005 season is based on the parent-year returns and returning age classes observed in the test fish samples from the Kobuk and Noatak Rivers in the 2004 season. During the 2005 season, the four-year-old component of the run is expected to be above average. The five-year-old component of the run is expected to be below average based on the four-year-old return this past season. The three-year-old and six-year-old age classes are much smaller components of the run and are expected to be average. The commercial harvest is expected to fall within the range of 75,000 to 125,000 chum salmon, if market conditions can accept that level of harvest.

Section 2: PACIFIC HERRING

(Includes Norton Sound, Port Clarence and Kotzebue Districts)

Boundaries

The Norton Sound District consists of all Alaska waters between the latitude of the western-most tip of Cape Douglas and the latitude of Canal Point Light (Map 5, Figure 8). The Port Clarence District consists of all Alaska waters between the latitude of Cape Douglas and the latitude of Cape Prince of Wales. The Kotzebue Sound District consists of all Alaska waters between the latitude of Cape Prince of Wales and the latitude of Point Hope.



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

Spawning Areas and Timing

Arrival of Pacific herring *Clupea harengus pallasi* on the spawning grounds is greatly influenced by climate and oceanic conditions, particularly the extent 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.

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

NORTON SOUND DISTRICT

Fishing History

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

Food Herring

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

Sac Roe

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

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

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

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

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

A public proposal adopted at the fall 1987 Board of Fisheries meeting changed the Norton Sound Herring Fishing District to Limited Entry status. Beginning with the 1988 season, a moratorium was placed on Norton Sound and no new entrants were allowed into the fishery. The Limited Entry Commission is currently 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 of 2004, most fishers have already received limited entry permits and others are still fishing with interim-use permits while eligibility is evaluated case-by-case.

No fishery occurred in 1992 because of a late ice breakup in Norton Sound. Low prices and declining market conditions resulted in a below average harvest in 1994. More recently, the five-year average harvest from 1998 to 2002 was 2,642 tons. Market conditions and climatic factors continue to influence the level of commercial harvest.

Spawn on Kelp

A small-scale spawn-on-kelp *Fucus sp.* fishery existed in Norton Sound from 1977 to 1984. Harvests during the 1977-1984 period ranged from less than one ton (1977) to approximately 47 tons (1981). During the 1984 season, one ton of *Macrocystis* kelp imported into Norton Sound

resulted in a harvest of approximately 3 tons of product. In response to a public proposal, the Board of Fisheries closed all spawn-on-kelp fisheries in Norton Sound before the start of the 1985 season.

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 open pound fishery to operate in Norton Sound during the 1998 season. In addition, the commissioner approved emergency regulations to allow a herring spawn on wild *Fucus* kelp fishery shortly before the normal start of the sac roe fishery. The intent of these decisions was to allow as much opportunity as possible to sac roe permit holders, since only a small minority would have an opportunity to participate in the sac roe fishery.

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

Management Strategies

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

Typically, herring are long-lived fish and will usually remain harvestable for at least five years after recruiting into the fishery. Harvesting only a percentage of the biomass ensures some fish will remain for following years. This type of strategy helps mitigate population fluctuations caused by successive years of poor recruitment, a common occurrence in marine spawning fish. Before 1983, harvests in Norton Sound were regulated by subdistrict so harvests would be dispersed over the entire fishing grounds. This strategy prevented concentrating harvest 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 projected biomass for management of Norton Sound herring. The herring fishery is managed for a 20% exploitation rate at biomass levels twice minimum threshold or greater. If the run does not materialize as projected, the harvest exploitation rate may be reduced to a lower level.

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

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

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

2004 SEASON SUMMARY

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

Spawn on Kelp

Permit holders intending 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. No permit holders registered as participants in the *Macrocystis* fishery.

There was no interest expressed in a commercial wild spawn-on-kelp fishery in 2004. There were no openings announced and no wild kelp was harvested.

Sac Roe

Prior to the 2004 herring fishery, the buyers contacted indicated they would not be purchasing in Norton Sound. This was the first year since 1978 that there was no market for sac roe herring. Historical fisheries information is presented in Appendix D3 and Appendix D4.

Bait Fishery

The only herring fishery that occurred in 2004 was conducted by king crab permit holders. A total of 11.4 tons of herring were reported caught for use as bait. Norton Sound Seafoods froze the herring for use by individual permit holders (Tables 9 and 10). No herring were reported sold. This was the lowest total herring harvest in the history of the fishery.

Fishery Management

The ADF&G projection of 2004 spawning biomass for the Norton Sound sac roe fishery was 28,787 tons. At 20% exploitation rate, the guideline harvest level for Norton Sound District was 5,757 tons with 5,437 tons allocated to the gillnet fishery.

The first Norton Sound aerial survey was conducted on May 16 from which 39 spawns totaling 10 miles were reported. This was one of the earliest spawns on record. Five surveys totaling 15.8 hours were conducted between May 16 and May 29 with 154 spawns totaling 31.3 miles observed.

The only management action necessary during the season was an emergency order opening the bait fishery from May 25 until July 1 (Appendix G7).

Catch Reporting and Enforcement

Individual king crab permit holders turned in bait herring fish tickets to the Nome ADF&G office at the end of the season. Communications with field camps was accomplished with marine SSB, satellite telephone or by aircraft radio from the aerial survey plane.

There was no enforcement officer on the Norton Sound herring grounds patrolling during the 2004 bait fishery.

Abundance and Research

Two Department field crews operated during the 2004 season collecting age-sex-length/weight data. One crew operated from Cape Denbigh and a second crew operated from a camp at Klikitarik. The test fish crews' presence and sampling efforts on the herring grounds are critical to proper management of the fishery and biological documentation of the stocks (Figure 9 and Figure 10).

Unalakleet field office personnel during the season consisted of one assistant area biologist, and one seasonal fishery biologist.

Biomass Determination

The peak aerial survey took place on May 24 when approximately 34,170 tons of herring were observed. Herring were distributed throughout all of the subdistricts surveyed (Table 11). This was

above the 28,787 tons of herring that was projected. Weather was good to fair for most of the aerial surveys. The primary spawning was thought to have taken place by May 18. A total of 31.3 miles of spawn were observed throughout the fishery.

2005 Outlook

By adjusting for growth and survival, it is estimated that the 2005 biomass will be 30,903 tons allowing a harvest of 6,181 tons at a 20% exploitation rate. A maximum of 320 tons of herring are reserved to allow for the pound fishery to harvest a maximum of 90 tons of product (combined weight of herring roe and kelp). This leaves 5,861 tons for sac roe harvest. Beach seine harvest is, by regulation, 10% of the sac roe projected harvest, or 586 tons. Inseason assessment of herring biomass will supersede projected biomass for management of the Norton Sound herring fishery, except where weather prevents obtaining an inseason estimate.

The 2005 herring fishery will be opened by emergency order and close by emergency order when up to 20% of the available herring biomass has been harvested. It is anticipated that a modest market for herring sac roe will be available in 2005. Varied harvest rates may be applied to individual subdistricts based on biomass distribution, roe quality, weather, and sea ice conditions. Ages 8, 9 and 12 are expected to dominate the returning biomass (49.7 %, 23.0 % and 4.4 %, respectively). Age 9 and older herring are expected to comprise 37.5 % of the return (Figure 11).

PORT CLARENCE / KOTZEBUE DISTRICTS

Introduction

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

Port Clarence and Kotzebue commercial herring fisheries have been in regulation since 1982. The 1983 and 1984 regulations set a guideline harvest of 150 mt (165 tons) for each district. Since the guideline harvest has never been changed or repealed by the Board of Fisheries, the 165 ton guideline harvest is still in effect. Presently purse seines, beach seines, and gillnets are legal commercial gear within these districts, and regulations allow spawn-on-kelp fisheries. Attempts at open pound *Macrocystis* harvest in 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 occurred during fall, fisheries in these districts were limited by lack of markets.

Resource Investigations

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

Seward Peninsula Populations	Southern Norton Sound to Southern Bering Sea Pelagic Populations
Smaller herring at age with lower vertebral counts.	Larger herring with probable higher vertebral counts.
Lower abundance.	Higher abundance.
Subtidal spawning (3m) in shallow bays, inlets and lagoons.	Intertidal and shallow subtidal spawning along exposed rocky headlands.
Zosteria sp. primary spawning substrate.	*Fucus* sp. primary spawning substrate.
More euryhaline.	Less euryhaline.
Overwinter in shallow bays; water is warmed by river discharge under ice cover.	Overwinter in deep ocean layers near the Pribilof Islands.
Fall (non-spawning) runs documented.	No fall runs documented.
Larval development in brackish water.	Larval development probable in more saline water.

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

growth than those in herring winter habitats along the Seward Peninsula, where apparently they have become adapted to Arctic conditions (Barton 1978).

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

Spring/Fall Food/Bait Fishery

Although a fall fishery has probably existed for subsistence use within these areas for many years, a commercial venture has only been attempted recently. Primary uses of those fish were for crab bait and dog food. Typically, fishing is during September and ice free portion of October. A fish buyer located at Nome in 1994 and 1995 provided a ready crab bait market, and transportation for fish facilitated a spring harvest. However, no one has fished for bait since 1996 (Appendix D5).

Sac Roe Fishery

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

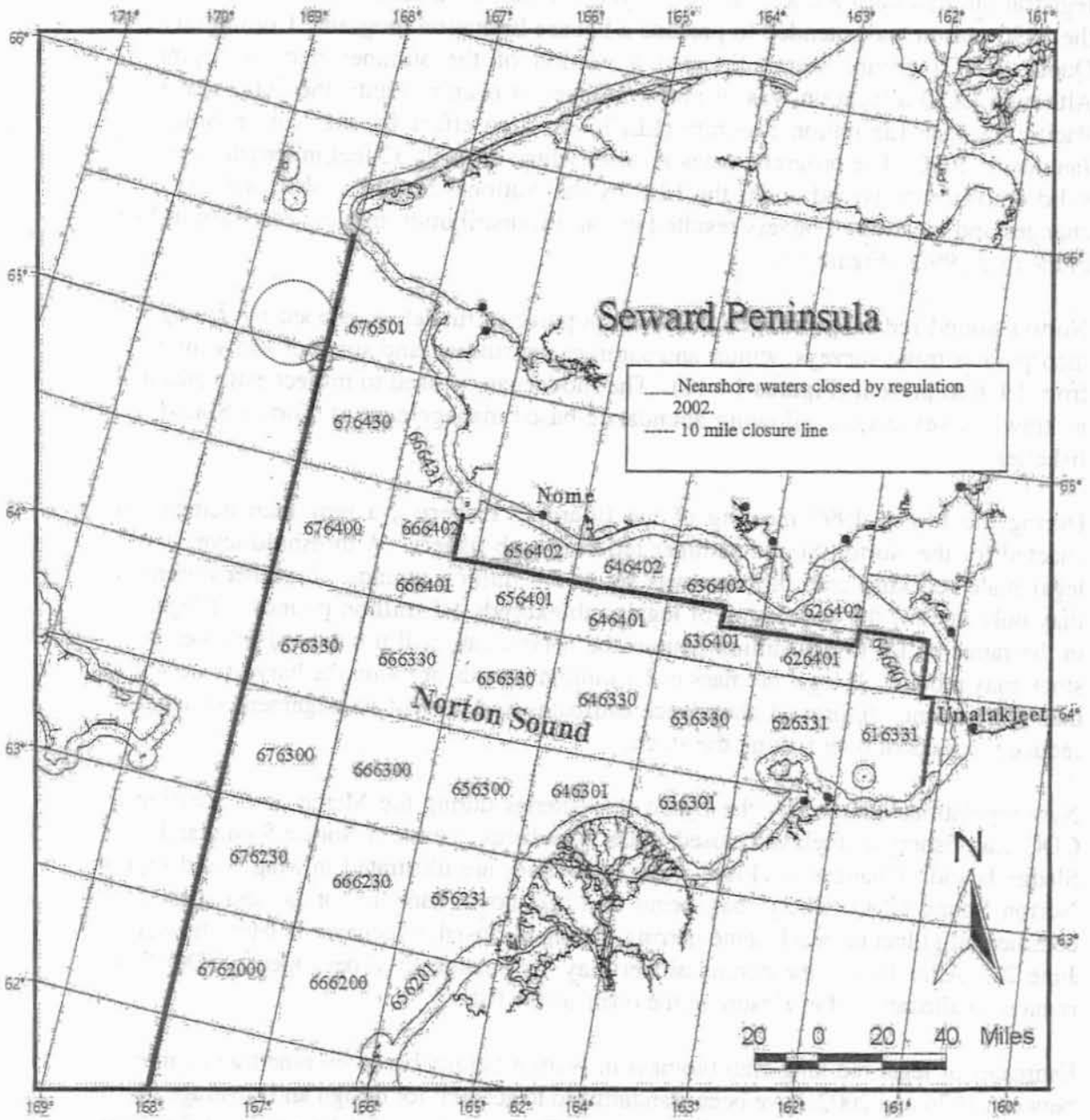
SECTION 3: KING CRAB

(Includes Norton Sound, Port Clarence and Kotzebue Districts)

INTRODUCTION

Norton Sound

Norton Sound Section (Q3) consists of all waters in Registration 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 12).



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 1990. No summer commercial fishery occurred in 1991 because staff needed to manage the fishery was cut the previous winter. In 1992, the summer commercial fishery resumed. Appendix E1 shows 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 super-exclusive designation went into effect for the Norton Sound commercial crab fishery June 27, 1994. This designation stated a vessel registered for the Norton Sound crab fishery may not be used to take king crab in any other registration area during that registration year. Later, a vessel moratorium put into place before the 1996 season was intended to precede a license limitation program. Community Development Quota (CDQ) groups were allocated a portion of the summer harvest beginning in 1998. Although CDQ allocation was in place, no harvest occurred until the 2000 season. The North Pacific License Limitation Program (LLP) went into effect for the Norton Sound crab fishery January 1, 2000. The program states a vessel which exceeds 32 feet in length overall must hold a valid crab license issued under the LLP by the National Marine Fisheries Service. Regulation changes and location of buyers resulted in harvest distribution moving eastward in Norton Sound in the mid 1990s (Figure 13).

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 (Figures 14-16). The model can be used to project estimates in years when no trawl survey occurs, allowing abundance-based management of 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. A threshold level of abundance of legal male red king crab biomass was set at 1.5 million pounds. Summer commercial season may only open if the population of legal crab exceeds 1.5 million pounds. If legal biomass falls in the range of 1.5 to 2.5 million pounds the harvest rate will not exceed five percent, so that the stock may rebuild. If legal biomass is 2.5 million pounds or more, the harvest rate will be no more than ten percent. Improved abundance estimates and current management strategy will greatly reduce the risks of over fishing the stock.

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

Estimates of legal red king crab biomass in Norton Sound, based on nine trawl surveys conducted between 1976 and 2002, have been standardized to account for design and coverage (Appendix E2). Norton Sound legal red king crab biomass in 1976 was estimated to be roughly 1.7 million crab. By 1982, legal biomass had fallen to 0.9 million crab because of little recruitment and high harvest rates in the summer commercial fishery. The population then gradually recovered to an estimated 1.3

million legal crab in 1991. The trawl survey conducted during August of 1996 indicated a reduced stock size and estimated legal biomass at 0.5 million crab. In 1999, the legal red king crab population of 1.6 million crab was estimated by a trawl survey to be near the historical high biomass (Appendix E2). The population level had nearly tripled since 1996. An all-time high prerecruit-1 male abundance (sublegal male crab with carapace length 90-104 mm) was also detected. Conversely, the exceptionally weak 1999 prerecruit-2 (sublegal male crab with carapace length 76-89 mm) abundance estimate suggested at least one year of weaker recruitment beginning during the 2001 summer fishery. The surveys taken as a whole indicate periods of weak and strong recruitment.

A combination of the trawl survey conducted during the summer of 1999 and 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. Estimated legal male crab abundance for the 2001 summer commercial crab fishery was 3.8 million pounds. Estimated legal male crab abundance for the 2002 summer commercial crab fishery was 3.1 million pounds, a 0.8 million pound decrease from 2001.

In August 2002, ADF&G conducted the triennial Norton Sound king crab trawl survey. Estimated abundance of legal male red king crab was 771,569 with a corresponding biomass of approximately 2.3 million pounds. This was less than half of the 1999 abundance estimate, yet above the all-time low in 1996. This decrease was expected, because the 1999 trawl survey indicated exceptionally weak prerecruit-2 abundance. Prerecruit-2 crab observed in 1999 made up the recruit and postrecruit portion of the 2002 legal population (Figure 15).

Estimated abundances for pre-1 and pre-2 males were 518,638 and 427,703 crab, respectively. The 2002 pre-1 male abundance estimate was lower than the all-time high observed in 1999, but higher than the three prior surveys. These crabs molted and gave a much-needed boost to the recruit portion of the legal crab biomass in 2003. Prerecruit-2 male crab abundance was over four times greater than 1999 and fourth highest abundance estimate since 1976 indicating increased recruitment for 2004 and 2005 seasons. These recruitment events should push the legal population to higher levels than we presently observe.

Estimated legal male crab abundance for the 2004 summer commercial crab fishery was 4.4 million pounds. This is up 30% from the 2003 legal male crab abundance of 3.1 million pounds. Current size composition data from the 2004 winter pot study indicates that the portion of the crab population classified as recruits has increased 16.9% since the 2003 winter survey, but the post recruit male crab population is still low. An 8 percent exploitation rate equated to a guideline harvest level of 353,000 pounds of crab for 2004. This follows the harvest strategy set by the Board of Fisheries. The winter pot study showed a large prerecruit-1 crab population that will molt and become part of the legal population in 2005. It also showed a very small number of prerecruit-2 crab and no prerecruit-3 crab were captured. These findings along with results from the 2002 trawl survey indicate the legal crab population will be expected to increase in 2005 followed by two years of decreased abundance. By regulation, the Community Development Quota (CDQ) fishery is allocated 7.5% of the summer season harvest and the CDQ harvest quota was set at 26,500 pounds preseason for 2004.

St. Lawrence Island

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

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

2004 COMMERCIAL FISHERY

Norton Sound Summer Open Access Commercial Fishery

The 2004 summer open access commercial crab fishery was opened by regulation on 12:00 noon, July 1 in Norton Sound Section. The guideline harvest level was 326,500 pounds of crab. Two companies were registered to buy crab in Norton Sound during the 2004 season. One of these buyers operated a seafood processing plant in Nome and purchased crab from only local Norton Sound fishers. Nonlocal fishers and some fishers based in Unalakleet delivered to the second buyer in Anchorage. Some fishers also sold their catch dockside as catcher/sellers. The open access portion of the fishery was closed by emergency order 12:00 noon, August 8, 2004 when the harvest was expected to approach the open access fishery goal of 326,500 pounds.

Total harvest from fish ticket reports was 110,962 red king crab or 314,472 pounds (Table 12). Of this total, 3,282 pounds were reported as dead loss. A total of 26 vessels made deliveries and 29 permit holders fished. Twenty of the fishers were considered local residents and six were non-local. A total of 208 landings were made. Local fishers accounted for 79 percent of the total crab harvest. The average weight for commercially caught crab was 2.83 pounds. A total of 1,120 pots were registered and there were 7,418 pot pulls during the fishery. The average price paid was $3.13 per pound. Exvessel value of the fishery is estimated at $984,297.

Fish ticket reports document 10 statistical areas fished in both the open access and CDQ fishery (Table 12, Figure 12). Stat areas 636401 and 656330 had the highest catch with 166,489 and 46,288 pounds of crab respectively. Other large catches came from stat areas 666401 (42,452 pounds), 666402 (23,344 pounds) 626401 (23,113 pounds) and 656401 (21,579 pounds). The 2004

catch from stat areas east of 164° made up 56.3 percent of the harvest (Figure 13, Appendix E1). All other stat areas comprised 43.7 percent of the harvest. Overall, catch per unit effort (CPUE) was 14.9 crab per pot. This was much greater than the 2003 CPUE of 11.0 crab per pot.

The first delivery was made on July 2. The final delivery was made August 9. Although the open access fishery ended 12:00 noon, August 8, some fishers had been holding storage pots off shore and had 24 hours to make deliveries. The commercial crab fleet concentrated in two main areas of operations throughout most of the open access fishery. A portion of the fleet delivered to a small tender vessel in northeastern Norton Sound that transported crab to Nome for processing. The other portion of the fleet based their operations out of the Port of Nome. These fishers sold crab to the seafood processing plant in Nome or flew live crab to a buyer in Anchorage. Crab were also shipped from Unalakleet to Anchorage.

CDQ Fishery

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

The CDQ fishery began at 12:00 noon June 15, 2004 and closed 12:00 noon June 28, 2004. Harvest was 9,327 crab at 26,274 pounds, 99% of the 26,500 pound CDQ allocation (Table 13). Nine vessels participated and 19 landings were made. There were a total of 648 pots pulled. Average price paid to fishers for their harvest was $3.00 per pound. Exvessel value was $78,822 for the CDQ fishery (Appendix E3).

Although the CDQ fishery has been in place since 1998, this was only the fourth year a CDQ harvest occurred and the first year the fishery harvested the entire allocation.

Commercial Catch Sampling

Carapace length measurements and shell age were collected from 9,605 commercially caught crab during the open access and CDQ fisheries. 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 ≥ 116 mm and all legal old shell males. Recruit crab made up 49 percent of the legal crab sampled and postrecruit crab made up 51 percent (Table 14). This was almost identical to samples from the 2003 fishery (Appendix E4). Male crab with new shells made up 92 percent of total legal crab sampled, and old shell crab made up 8 percent. Overall, mean carapace length of legal male crab was 116.5 mm (Table 14 and Figure 16). This was a decrease from the 2003 fishery and is most likely due to increase in recruit crab seen in 2004.

The Norton Sound red king crab fishery had the benefit of an onboard observer during the 2000 and 2001 seasons because there was a floating processor on the fishing grounds. In years when there is no onboard observer, a smaller percentage of crab from the commercial harvest gets sampled because fishers deliver at all times of day and night. The new seafood processing plant that began operating in Nome in summer 2002 greatly improved ability of Nome ADF&G staff to sample crab brought to the Nome dock. ADF&G will continue to make a concerted effort to coordinate catch sampling with fishers and buyers to ensure optimal commercial harvest data collection.

Enforcement

The Nome Fish and Wildlife Protection officer was unable to patrol the 2004 summer king crab fishery.

Norton Sound Winter Commercial Fishery

A winter commercial fishery in 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 sea ice greatly affects success of the winter fishery. Appendix E5 illustrates winter commercial and subsistence harvest of crab from 1978 to 2004. During the winter of 2003-2004, 2 commercial fishers reported selling 522 red king crab. Sea ice conditions were very bad for the majority of the season and fishers reported losing pots when the ice moved out during the season.

The harvest is divided between local residents who buy crab directly from the fishers, the new seafood plant in Nome, and other non-local markets such as Anchorage. Average price paid for crab was $3.95 per pound. The 2004 winter catch of crab was estimated to be worth $5,112. 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.

SUBSISTENCE FISHERY

Norton Sound residents utilize red king crab for subsistence, mainly during winter. Fishing occurs through cracks or holes cut in the ice with the use of hand lines and pots. To document trends in subsistence harvest, the Board of Fisheries enacted a regulation in 1977 requiring subsistence fishers in Norton Sound to obtain a permit before fishing. Fishers record their daily effort and catch on these permits. During the 2003-2004 season, 96 permits were issued in the Nome area, 77 were returned, and 41 permit holders reported fishing (Table 15). A total of 1,182 crab were recorded as kept for subsistence use in the Nome area.

The first year that subsistence permits were required, 1978, had the highest number of permits issued and highest reported harvest. The fishery declined sharply the following year and remained

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

FUTURE INVESTIGATIONS

A winter pot survey is planned during February, March and April of 2005. Results of the winter project will be used in the length-based model to project the summer 2005 legal biomass and appropriate guideline harvest level (GHL). Size composition by year from the winter king crab project is shown in Appendix E6.

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 Norton Sound, Port Clarence and Kotzebue Districts. Primary species include inconnu or "sheefish" *Stenodus leucichthys*, whitefish *Coregonus laurettae, C. pidschian, C. sardinella, C. 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 summer months are normally air dried, and winter catches are stored frozen. Fish are utilized for human consumption and for dog food. Fish taken for commercial purposes are mainly sold locally, although some are shipped out of the area.

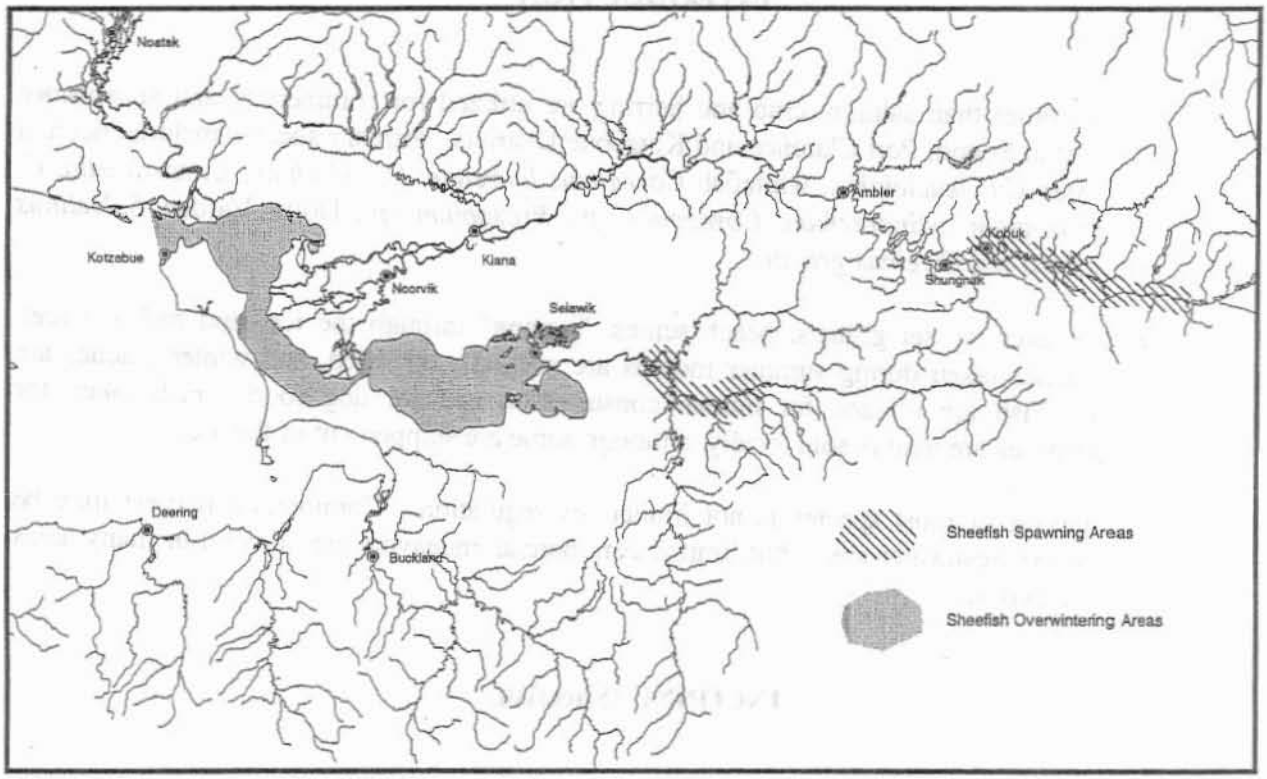
Subsistence harvest of most species is not limited by regulation. Commercial harvest may be prohibited in some freshwater areas, but limited commercial endeavors are allowed in many areas under terms of a permit.

INCONNU (Sheefish)

Introduction

Distribution of inconnu includes the Kobuk-Selawik River drainages, and Hotham Inlet of Kotzebue Sound and some Norton Sound drainages, but largest populations and harvests occur within the former area (Map 7, Figure 17). In the Kotzebue Sound area, adult fish migrate to upriver spawning areas after ice breakup and to wintering areas within 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 various fisheries throughout their life cycle, and increases their vulnerability to overharvest. In addition, the inconnu's slow maturation rate increases 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 inconnu stocks were overharvested by the commercial and subsistence fisheries in Kotzebue district. Consequently, an annual area commercial harvest quota of 25,000 pounds was instituted, although subsistence catches remained unrestricted.

Commercial Fishery

Most commercial fishing effort occurs near Kotzebue in Hotham Inlet. Set gillnets or jigging gear can be used. Fishers use gillnets ranging from 5 1/2 inch to 7 inch stretched mesh which are set under the ice. Regulations limit gillnets to no more than 50 fathoms, no more than 12 meshes deep and a maximum mesh size of seven inches (5 AAC 03.621). Recorded commercial catches have remained relatively small; however, undocumented catches are believed to be significant and therefore, harvest totals should be considered minimum estimates. Restricted markets outside northwestern Alaska greatly limit commercial activity and most individuals who normally participate in the winter commercial fishery also fish for subsistence purposes. Incidentally caught inconnu are sold by commercial salmon fishers in years there is a market, but only in small amounts. Reported harvest and effort in the commercial fishery has declined in recent years. Although inconnu were likely harvested and sold in 2004 by several fishers, no fish tickets were turned in to ADF&G (Appendix F1).

Subsistence Fishery

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

Inconnu have long been utilized for subsistence purposes throughout Kotzebue basin. Fishing for inconnu occurs along Kobuk and Selawik Rivers from June through October with gillnets, beach seines, and rod and reel. In spring residents of Kotzebue, Noorvik and Selawik harvest inconnu with hand jigs through the ice of Hotham Inlet and Selawik Lake. In early winter, Kotzebue, Noorvik and Selawik fishers use gillnets set under the ice in Hotham Inlet and Selawik Lake.

Appendix F2 shows estimated inconnu catches reported during chum salmon subsistence surveys conducted in fall by Subsistence Division, and for Kobuk River residents may include winter, summer, and fall catches. The 2004 Kobuk River communities' inconnu harvest estimate is not available at this writing. Subsistence inconnu harvest information was not collected for Kotzebue where a sizable ice fishery occurs for sheefish in late winter and spring. No information is available concerning inconnu harvests in Selawik area.

Escapement

Historically aerial surveys were conducted on key inconnu spawning areas incidental to effort of enumerating salmon. These surveys were primarily conducted along 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. Surveys were not conducted in 1984 through 1990 because of high, turbid water, poor weather conditions, or lack of personnel. Through the early 1990s, incomplete escapement and catch data provided little basis for assessing current population status of inconnu in Kotzebue district, however some local residents were concerned that the inconnu stocks were declining.

Because of these concerns, a cooperative tagging project on inconnu in Kotzebue District began in 1994. This study was conducted by Sport Fish Division of ADF&G, U.S. Fish & Wildlife Service (USFWS), and National Park Service (NPS). Spawning inconnu were tagged in Upper Kobuk River and Selawik River. Roughly 600 sheefish were tagged in Kobuk River by Division of Sport Fish and 150 in Selawik River by USFWS in 1994. During the fall of 1995, roughly 617 inconnu were tagged in Upper Selawik River and approximately 1,386 were tagged in Upper Kobuk River. In 1996, 2,300 were tagged in Upper Kobuk and 500 in Selawik River. The Selawik River project ended in 1996. In 1997, 1,757 inconnu were tagged in Upper Kobuk River. Spawning population estimates of inconnu in Upper Kobuk River were 32,273 in 1995, 43,036 in 1996 and 26,800 in 1997. Inconnu spawn upstream of the village of Kobuk; greatest observed concentrations were

between Meneluk and Beaver Rivers. After spawning is complete in late September, fish disperse to downstream overwintering areas. In Selawik River, the spawning population estimate was 5,200 to 5,300 for both 1995 and 1996. 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 Norton Sound, Port Clarence, and Kotzebue Districts. Although taxonomists disagreed on the distinguishing Dolly Varden characteristics and distribution of Arctic Char and Dolly Varden, most now agree char in this area are the northern form of Dolly Varden. To eliminate confusion, in this report these fish are referred to as Dolly Varden, the common name for this species complex; however, locally they are called trout.

Dolly Varden in this area are primarily nonconsecutive spawners and spawn throughout late summer and fall. Fry emerge in 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 potential of overharvest and provide for reproductive and subsistence fishery needs.

Commercial Fishery

Dolly Varden are taken as a non-target species in the directed Kotzebue commercial chum salmon fishery. Regulation changes in 1976, which closed the commercial salmon fishery on August 31, reduced 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. In 2004, 124 Dolly Varden were incidentally caught in the commercial fishery. Reported Dolly Varden catches are dependent upon available markets. The typical season catch, when buyers are purchasing Dolly Varden, is between 1,000 to 3,000 fish (Appendix F4). Spawning and overwintering Dolly Varden typically begin migrating along the northern shore of Kotzebue Sound during the third week of August.

Subsistence Fishery

Dolly Varden are an important component in the diet of subsistence users in Norton Sound-Kotzebue Sound areas. Subsistence fishers in Kotzebue District catch Dolly Varden with beach seines in fall, hook and line through ice in winter, and gillnets in spring. The fall seine fishery contributes the greatest number of fish to the annual subsistence Dolly Varden harvest. Since 1962, catches made by residents of Kivalina ranged from 7,000 to 65,000 Dolly Varden annually (Appendix Table F5).

In Kotzebue District, fall seine fishing is a group effort with several households comprising a fishing group. 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. Note: historical subsistence Dolly Varden catches in Appendix Table F5 are minimal figures because of survey timings. Most Dolly Varden harvests take place before or just after freeze-up. The village of Noatak usually fishes before freeze-up, but Kobuk River villages of Shungnak and Noorvik fish for Dolly Varden throughout the winter. The 2004 subsistence Dolly Varden harvest estimates by community are not available at this writing.

Most villagers in 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 late fall.

Sport Fishery

Residents of Kotzebue area and nonlocal residents boating on Kobuk and Noatak Rivers are the primary participants in the Dolly Varden sport fishery in the Kotzebue area. Approximately 1,500 Dolly Varden are taken in this fishery annually (Sport Fish Division surveys). The 2004 sport fishing estimates are not available at this writing.

Overwintering Counts

Aerial survey counts of overwintering Dolly Varden on the Wulik River ranged from 297,257 fish in 1969 to 1,500 fish in 2003 (Appendix F6). Weather and water conditions have precluded flying aerial surveys during many years. Weather permitting, the Division of Sport Fisheries conducts aerial surveys of Noatak River spawning grounds in summer, and Kivalina and Wulik Rivers overwintering areas in fall. A survey flown on Kivilina River in 2004 counted 100,806 Dolly Varden (Appendix F6).

WHITEFISH

Introduction

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

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

Commercial Fishery

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

Subsistence Fishery

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

Subsistence catch enumeration is difficult since fishers do not count fish individually, but by "tubs", "bags", "strings" or any other estimators of gross abundance. Additionally, many fish are dried and consumed or stored in caches before the survey period. Reported subsistence harvests were generally the result of a limited and sporadic survey effort and should be regarded as minimum values and not comparable from year to year. In 1997, subsistence harvests of whitefish were included for the first time in Division of Subsistence household salmon harvest surveys in Kotzebue Sound villages. An estimated 73,242 whitefish were harvested in 2003 for subsistence in Noatak and Kobuk villages (Appendix Table F7). Mean household harvests ranged from 364 whitefish in Noorvik to 42 whitefish in Noatak (Georgette et al 2003). Harvest figures for 2004 are not yet available.

Escapement

Whitefish escapements have not been monitored in the past, but limited ADF&G observations and fisher interviews do not indicate declining populations.

SAFFRON COD

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

An extensive commercial fishery on tomcod in Norton Sound, Port Clarence or Kotzebue areas has never occurred. During 1980, one fisher caught and sold 89 pounds (98 tomcod) in Nome Subdistrict. 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 1984-1988 and 1990-1993.

In 1994, Norton Sound Economic Development Corporation (NSEDC) provided a market for several fish species not 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 during January and February of 1994. In 1995, the NSEDC market was not present, which was likely a factor in reduced harvest. The 1995 harvest totaled 52 pounds which sold for $.50 per pound for a total value of $26.00. No commercial harvest was reported from 1996 through 2004.

MISCELLANEOUS FINFISH SPECIES

Other finfish species taken for subsistence in Norton Sound, Port Clarence, and Kotzebue areas include: rainbow smelt (boreal smelt), capelin, northern pike, starry flounder, yellow fin sole, Arctic flounder, Alaska plaice, Arctic grayling, burbot, Pacific herring in 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. Smelt and cod harvests from Unalakleet both occur in estuarine areas. Smelt were reported higher in the water column than cod. Either species could often be harvested from the same jigging site. Small numbers of burbot, or freshwater cod, have been commercially sold sporadically in the past in Kotzebue, Port Clarence and Norton Sound Districts under commercial permits.

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Table 1. Norton Sound commercial salmon harvest summary by subdistrict, 2004.

		Subdistricts						
		1	2	3	4	5	6	Total
Number of Fishers		0	0	0	0	11	25	36
Chinook	Number	0	0	0	0	0	0	0
	Weight(lbs.)	0	0	0	0	0	0	0
Sockeye	Number	0	0	0	0	0	40	40
	Weight(lbs.)	0	0	0	0	0	254	254
Coho	Number	0	0	0	0	12,734	29,282	42,016
	Weight(lbs.)	0	0	0	0	92,579	209,800	302,379
Pink	Number	0	0	0	0	0	0	0
	Weight(lbs.)	0	0	0	0	0	0	0
Chum	Number	0	0	0	0	1,372	4,924	6,296
	Weight(lbs.)	0	0	0	0	9,715	32,670	42,385
Total	Number	0	0	0	0	14,106	34,246	48,352
	Weight(lbs.)	0	0	0	0	102,294	242,724	345,018

Table 2. Tier I subsistence salmon harvest for northern Norton Sound, 2004.

	Permits	Number of Salmon Harvested					
	Fished [a]	Chinook	Sockeye	Coho	Pink	Chum	Total
Marine Waters	26	54	47	134	390	39	664
Bonanza River	13	0	0	49	118	0	167
Cripple Creek	7	0	0	42	68	0	110
Eldorado River	6	0	2	19	361	41	423
Flambeau River	3	0	1	29	0	2	32
Nome River- above weir	15	0	0	51	353	1	405
Nome River- below weir	225	0	0	637	8,114	5	8,756
Nome River- location unknown	3	0	0	16	57	0	73
Penny River	9	0	0	48	87	0	135
Safety Sound	5	1	0	3	326	0	330
Sinuk River	29	0	15	32	241	0	288
Snake River	33	0	0	120	530	1	651
Solomon River	32	1	0	61	321	0	383
Nome Subdistrict Total [b]	**324**	**56**	**65**	**1,241**	**10,966**	**89**	**12,417**
Cape Woolley [c]	**11**	**0**	**30**	**8**	**202**	**60**	**300**
Marine Waters	23	113	0	55	5563	223	5,954
Fish River	57	48	6	443	9,217	462	10,176
Niukluk River- above tower	13	0	0	14	451	2	467
Niukluk River- below tower	5	2	0	22	373	118	515
Niukluk River- location unknown	11	0	0	61	998	10	1,069
Other Rivers and Creeks	14	1	0	57	3,284	59	3,401
Golovin Subdistrict Total [d]	**128**	**164**	**6**	**652**	**19,886**	**874**	**21,582**
Marine Waters	7	88	0	5	75	51	219
Kwiniuk River - above tower	10	8	0	30	1,921	247	2,206
Kwiniuk River - below tower	40	143	0	357	3,775	52	4,327
Kwiniuk River - location unknown	3	16	0	28	130	10	184
Tubutulik River	26	150	0	112	1,883	252	2,397
Iron Creek	9	6	0	134	74	70	284
Other Rivers and Creeks	3	0	0	28	0	1	29
Moses Point Subdistrict Total [e]	**50**	**411**	**0**	**694**	**7,858**	**683**	**9,646**
Port Clarence - Marine Waters	52	130	3,094	693	4,147	1,230	9,294
Tuksuk Channel	12	58	948	246	784	823	2,859
Imuruk Basin	5	4	44	6	141	13	208
Kuzitrin River	11	27	656	36	524	382	1,625
Pilgrim River- above weir	54	20	1,413	18	125	12	1,588
Pilgrim River- below weir	74	37	2,133	32	96	41	2,339
Port Clarence District Total [f]	**217**	**276**	**8,288**	**1,031**	**5,817**	**2,501**	**17,913**
Total	**730**	**907**	**8,389**	**3,626**	**44,729**	**4,207**	**61,858**

[a] There were 6 locations Tier I subsistence permits were issued in 2004 for northern Norton Sound: 1 - Nome Subdistrict; 2 - Cape Woolley; 3 - Golovin Subdistrict; 4 - Moses Point Subdistrict; 5 - Pilgrim River; and 6 - Port Clarence District. Except for Pilgrim River, each permit is valid for both marine and fresh waters. Permits fished include those permit holders who fished, but reported no harvest.

[b] There were 443 Nome Subdistrict permits issued, and 434 were returned.

[c] There were 14 Cape Woolley permits issued, and 14 were returned.

[d] There were 199 Golovin Subdistrict permits issued, and 196 were returned.

[e] There were 61 Moses Point Subdistrict permits issued, and 58 were returned.

[f] There were 223 Pilgrim River permits issued, and 221 were returned and 149 Port Clarence permits were issued, and 146 were returned.

Table 3. Tier II subsistence salmon harvest by Nome area fishers, Norton Sound, 2004.

Indicated Fishing Area(s)	Fished [a]	Number of Salmon Harvested					
		Chinook	Sockeye	Coho	Pink	Chum	TOTAL
Indicated Area(s)							
Bonanza River	9	6	8	92	99	22	227
Cripple Creek	0	0	0	0	0	0	0
Eldorado River [b]	10	0	2	33	764	116	915
Flambeau River	2	0	2	53	0	15	70
Marine Waters	23	36	23	102	1,962	401	2,524
Nome River [c]	19	0	1	35	1,083	2	1,121
Penny River	0	0	0	0	0	0	0
Safety Sound	2	1	4	0	15	35	55
Sinuk River	2	1	1	6	29	5	42
Snake River	0	0	0	0	0	0	0
Solomon River	5	0	0	12	129	0	141
Nome Subdistrict Total	49	44	41	333	4,081	596	5,095

[a] Fifty-two permits were issued in 2004. Permit holders can fish more than one area.

[b] All salmon harvested below the weir, except for 32 pink salmon.

[c] All salmon harvested below the weir.

Table 4. Salmon counts of Norton Sound rivers in 2004 and associated salmon escapement goal ranges (SEG, BEG or OEG).

Stream Name	Chinook				Chum			
	Weir/ Tower Count	Escapement Goal Range	Aerial Survey Count [a]	Escapement Goal Range	Weir/ Tower Count	Escapement Goal Range	Aerial Survey Count [a]	Escapement Goal Range
Salmon L.								
Grand Central R.								
Agiapuk R.							705	
American R.							4025	
Pilgrim R.	925				10,228		292	
Glacial L.					3			
Sinuk R.						4,000 - 6,200 [b]	100	
Cripple R.							0	
Penny R.							0	
Snake R.	17		1		2,145	1,600 - 2,500 [c]	350	
Nome R.	51		0		3,903	2,900 - 4,300 [c]	3	
Flambeau R.						4,100 - 6,300 [b]	2,250	
Eldorado R.	25		2		3,273	6,000 - 9,200 [c]	109	
Bonanza R.			1			2,300 - 3,400 [b]	53	
Solomon R.			0			1,100 - 1,600 [b]	100	
Fish R.			19	**Combined**			621	**Combined**
Boston Cr.			93	**100 - 250**			55	**23,200 - 46,400**
Niukluk R.	135		15		10,791		173	20,000
Ophir Cr.								
Kwiniuk R.	645	300 - 550	81		10,371	11,500 - 23,000 [d]	1,132	
Tubutulik R.			321			9,200 - 18,400 [b, c]	1,117	
Ungalik R.			89				164	
Inglutalik R			159				203	
Pikmiktalik R	225				8,153			
Shaktoolik R. [e]			91	400 - 800			777	
Unalakeet R.			309	**Combined**			340	**Combined**
Old Woman R.			89	**550 - 1,100**			80	**2,400 - 4,800**
North R.	1,104	1,200 - 2,600	189		9,624		283	

-Continued-

Table 4. (Page 2 of 2)

Stream Name	Coho Weir/ Tower Count	Coho Aerial Survey Count [a]	Coho Escapement Goal Range	Sockeye Weir/ Tower Count	Sockeye Aerial Survey Count [a]	Sockeye Escapement Goal Range	Pink Weir/ Tower Count	Pink Escapement Goal Range	Pink Aerial Survey Count [a]
Salmon L.					23,005	**Combined**			
Grand Central R.					2,855	**4,000 - 8,000**			
Pilgrim R.	1,556			85,520			50,757		
Glacial L.				8,115	970	800 - 1,600			
Sinuk R.		2,085			177				1,267,100
Cripple R.		658							197,000
Penny R.		358							48,000
Snake R.	474	1,916		28	0		126,917		102,530
Nome R.	2,283	1,687		139	3		1,051,146	>13000	707,350
Flambeau R.		751							200
Eldorado R.	1,149	755					60,861		52,000
Bonanza R.		1,231							185,000
Solomon R.		847							109,000
Fish R.		90							404,430
Boston Cr.		140							135,000
Niukluk R.	1,833	828	**Combined**				1,022,302	>10400	277,900
Ophir Cr.		153	**950 - 1,900**						
Kwiniuk R.	10,523	1,237	650-1,300				3,045,915	>8400	948,000
Tubutulik R.		779							391,000
Ungalik R.									19,500
Inglutalik R									1,004
Pikmiktalik R	11,799						50,621		
Shaktoolik R.		3,252							238,700
Unalakeet R.		3,281							237,100
Old Woman R.		1,086							44,018
North R.	9,646	1,386	550-1,100				1,149,294	>25000	264,000

[a] All aerial surveys are rated fair to good, unless otherwise noted.

[b] The goal listed is actual fish and not aerial counts. However, at this time there is no counting project on the river.

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

[d] This represents the OEG in regulation. The BEG is 10,000-20,000 for the Kwiniuk River and 8,000-16,000 for the Tubutulik River.

Table 5. Commercial salmon set gillnet catches from Shaktoolik, Subdistrict 5, Norton Sound, 2004.

				Period Catch and Catch Per Unit Effort						Cumulative Catch		
Period	Length of period (hrs)	Date	Fishers	Chinook	Chinook CPUE	Chum	Chum CPUE	Coho	Coho CPUE	Chinook	Chum	Coho
1	48	7/26-7/28	1	0	0.00	37	0.77	158	3.29	0	37	158
2	48	7/29-7/31	5	0	0.00	269	1.12	700	2.92	0	306	858
3	48	8/02-8/04	6	0	0.00	611	2.12	1,317	4.57	0	917	2,175
4	48	8/05-8/07	7	0	0.00	215	0.64	1,539	4.58	0	1,132	3,714
5	48	8/08-8/10	7	0	0.00	240	0.71	906	2.70	0	1,372	4,620
6[a]	48	8/11-8/13	9	0	0.00	0	0.00	797	1.84	0	1,372	5,417
7	48	8/15-8/17	10	0	0.00	0	0.00	2,571	5.36	0	1,372	7,988
8	48	8/18-8/20	9	0	0.00	0	0.00	1,199	2.78	0	1,372	9,187
9	48	8/22-8/24	8	0	0.00	0	0.00	1,145	2.98	0	1,372	10,332
10	48	8/25-8/27	7	0	0.00	0	0.00	836	2.49	0	1,372	11,168
11	48	8/29-8/31	6	0	0.00	0	0.00	1,301	4.52	0	1,372	12,469
12	48	9/02-9/04	7	0	0.00	0	0.00	265	0.79	0	1,372	12,734
13	48	9/05-9/07										
Total	624		11	-		1,372		12,734				

[a]The buyer did not purchase chum after Period 5. There was no buyer for Period 13.

Table 6. Commercial salmon set gillnet catches from Unalakleet, Subdistrict 6, Norton Sound, 2004.

				Period Catch and Catch Per Unit Effort						Cumulative Catch		
Period	Length of period (hrs)	Date	Fishers	Sockeye	Sockeye CPUE	Chum	Chum CPUE	Coho	Coho CPUE	Sockeye	Chum	Coho
1	48	7/26-7/28	16	4	0.01	1,176	1.53	1,215	1.58	4	1,176	1,215
2	48	7/29-7/31	17	18	0.02	1,400	1.72	2,037	2.50	22	2,576	3,252
3	48	8/02-8/04	17	5	0.01	920	1.13	3,348	4.10	27	3,496	6,600
4	48	8/05-8/07	19	6	0.01	786	0.86	4,120	4.52	33	4,282	10,720
5	48	8/08-8/10	16	5	0.01	620	0.81	2,654	3.46	38	4,902	13,374
6[a]	48	8/11-8/13	19	0	0.00	22	0.02	2,937	3.22	38	4,924	16,311
7	48	8/15-8/17	14	2	0.00	0	0.00	2,440	3.63	40	4,924	18,751
8	48	8/18-8/20	11	0	0.00	0	0.00	2,129	4.03	40	4,924	20,880
9	48	8/22-8/24	14	0	0.00	0	0.00	1,959	2.92	40	4,924	22,839
10	48	8/25-8/27	12	0	0.00	0	0.00	2,762	4.80	40	4,924	25,601
11	48	8/29-8/31	8	0	0.00	0	0.00	1,964	5.11	40	4,924	27,565
12	48	9/02-9/04	11	0	0.00	0	0.00	1,717	3.25	40	4,924	29,282
13	48	9/05-9/07										
Total	624		25	40		4,924		29,282				

[a]The buyer did not purchase chum after Period 5. There was no buyer for Period 13.

Table 7. Kotzebue District commercial catches of chum salmon, Chinook salmon, and Dolly Varden by week, 2004.

Week	Number of Fishers	Chum			Chinook			Dolly Varden		
		Number	Pounds	Avg. Wt.	Number	Pounds	Avg. Wt.	Number	Pounds	Avg. Wt.
7/12 - 7/17	19	5,054	42,769	8.5	66	784	11.9	0	0	0.0
7/19 - 7/24	23	10,221	86,518	8.5	28	313	11.2	0	0	0.0
7/29 - 7/30	21	6,742	58,126	8.6	12	106	8.8	0	0	0.0
8/2 - 8/6	26	12,158	102,023	8.4	4	48	12.0	0	0	0.0
8/9 - 8/13[a]	23	8,467	64,834	7.7	5	51	10.2	107	726	6.8
8/16 - 8/20	19	8,396	64,789	7.7	1	24	24.0	17	120	7.1
Total[b]	43	51,038	419,059	8.2	116	1,326	11.4	124	846	6.8

[a] There were 3 sockeye caught the week of 8/09 and the average weight was 7.3 pounds.

[b] Total does not include 39 chum and 12 chinook salmon kept for personal use during the season.

Table 8. Kobuk River chum salmon drift test fish mean daily and cumulative CPUE, 1993-2004.

Date	1993		1994		1995		1996		1997		1998		1999		2000		2001		2002		2003		2004	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
10-Jul							15.00	27.77	0.00	5.85	5.22	5.22			2.50	4.61	8.39	24.97	6.83	35.40	11.21	11.21	19.93	19.93
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	22.86	58.26	3.76	14.97	12.00	31.93
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	3.46	11.50	12.63	57.67	31.54	89.80	2.20	17.17	6.10	38.03
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	21.67	111.47	5.19	22.36	11.89	49.92
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	28.05	139.52	6.06	28.42	11.32	61.24
15-Jul	35.08	81.05	2.58	5.26	2.77	6.50	83.75	329.73	3.65	28.25	14.07	43.56	0.00	0.00	0.87	23.48	38.86	159.42	14.27	153.79	4.49	32.91	6.15	67.39
16-Jul	13.19	94.24	11.35	16.61	a	6.50	71.35	401.08	14.28	42.53	17.33	60.89	0.00	0.00	3.38	26.86	32.80	192.22	35.27	189.06	5.33	38.24	12.75	80.14
17-Jul	17.27	111.51	a	16.61	0.00	6.50	55.49	456.57	15.17	57.7	5.07	65.96	4.26	4.26	12.77	39.63	48.77	240.99	36.60	225.56	0.00	38.24	6.15	86.29
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	6.48	12.74	3.56	43.21	36.96	277.97	24.41	249.97	8.83	47.07	1.53	87.82
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	30.30	280.27	5.37	52.44	1.53	89.35
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	44.91	325.18	15.14	67.58	17.30	106.65
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	36.30	361.48	2.23	69.81	6.10	112.75
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	33.85	395.33	2.20	72.01	4.46	117.21
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	40.00	435.33	5.93	77.94	10.57	127.78
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	62.76	498.09	11.01	88.95	9.87	137.65
25-Jul	a	169.91	14.38	81.55	40.16	213.42	76.80	1,028.01	21.57	178.83	24.68	187.1	28.73	119.17	22.98	199.87	80.59	699.92	45.64	543.73	17.30	106.25	12.87	150.52
26-Jul	15.22	185.13	47.65	129.2	35.15	248.57	55.68	1,083.69	14.66	193.49	a	187.1	39.72	158.89	40.28	240.15	94.06	793.98	34.29	578.02	41.36	147.61	12.95	163.47
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	50.41	628.43	29.65	177.26	14.62	178.09
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	a	628.43	23.41	200.67	29.82	207.91
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	25.74	654.17	37.89	238.56	13.80	221.71
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	28.90	683.07	53.63	292.19	15.80	237.51
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	160.5	504.47	85.87	664.08	38.63	1,075.60	18.33	701.40	48.54	340.73	18.00	255.51
1-Aug	a	223.98	82.16	412.68	72.91	581.77	167.7	1,517.90	41.41	366.92	25.44	362.8	145	649.49	101.16	765.24	61.50	1,137.10	27.85	729.25	17.94	358.67	19.75	275.26
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	19.93	749.18	38.62	397.29	20.84	296.1
3-Aug	54.49	285.21	71.79	549.59	48.40	678.88	48.70	1,628.62	35.21	424.54	26.67	389.47	33.19	724.35	44.32	873.93	44.21	1,197.86	25.31	774.49	15.41	412.7	43.09	339.19
4-Aug	44.23	329.44	109	658.57	53.00	731.88	65.93	1,694.55	26.67	451.21	42.35	431.82	74.23	798.58	77.14	951.07	30.71	1,228.57	a	774.49	20.12	432.82	66.08	405.27
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	906.62	67.26	1,018.33	43.64	1,272.21	12.86	787.35	29.14	461.96	93.54	498.81
6-Aug	18.6	437.34	102.6	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	23.05	810.40	31.21	493.17	71.20	570.01
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	10.18	820.58	62.81	555.98	56.59	626.6
8-Aug	a	457.86	62.75	883.62	44.02	872.24	146.9	2,073.28	45.07	599.00	16.40	467.90	a	1,072.14	93.37	1,188.12	34.40	1,362.92	11.96	832.54	39.29	595.27	41.18	667.78
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	8.60	841.14	27.24	622.51	45.54	713.32
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	54.88	1,440.81	15.27	856.41	29.18	651.69	27.13	740.45
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	11.10	867.51	40.34	692.03	56.70	797.15
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	7.66	**875.17**	17.04	709.07	57.57	**854.72**
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**			39.79	**748.86**		
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**																		

* Regular day off

Table 9. Norton Sound herring buyers and associated data, 2004.

Company	Representative or Contact Name	Processing or Tendering Vessels	Type of Processing
Norton Sound Seafood	Tom Magwire	Land based	Freezing

Table 10. Sac roe herring harvest and effort by date and subdistrict, Norton Sound District, 2004.

	Subdistrict 1 (333-70)				Subdistrict 7 (333-80)				Combined Totals		
Date	Number Fishers	Sac roe tons	Roe %	Bait tons	Number Fishers	Sac roe tons	Roe %	Bait tons	Number Fishers	Sac roe tons	Bait tons
5/26	0	-		-	3			4.1	3	-	4.1
5/27[a]					2			7.3	2	-	7.3
Total						-		11.4	3	-	11.4

[a]Fishing dates are in question as the tickets were not issued until after the season.

Table 11. Daily observed peak biomass estimates of Pacific herring, Norton Sound District, 2004.

			Survey		Spawn		Estimated Biomass (ST) By Index Area							
Date	Flight No.	Observer Initials	Hours	Rating	No.	Length (mi)	KLK	UNK	CDB	NTB	ELM	GOL	NOM	TOTAL
16-May-04	1	WWJ	2.5	4	39	10.0	8262.4	292.3	295.5					8850.2
18-May-04	2	WWJ	3.3	5	56	14.8	7420.0	124.3	659.5					8203.8
20-May-04	3	WWJ	2.5	3	28	3.3	8664.8	2209.0	19032.5					29906.3
24-May-04	4	WWJ	2.8	2	29	2.8	5724.8	10882.0	17563.2					34170.0
29-May-04	5	WWJ	4.8	3	2	0.5	1189.5	3927.6	10686.8	9526.1	3757.4	539.1	525.2	30151.7
Sum			15.8	3	154.0	31.3						Total Harvest		11.4

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

Survey	34,170.0
Biomass	34,181.4
Exploit%	0.03%

Table 12. Commercial harvest of red king crab from Norton Sound Section by statistical area, Norton Sound District, 2004 (summer fishery only).

Statistical Area	Number[a]	Pounds	Pots Pulled	CPUE	Average Weight (Lbs.)
626401	8,320	23,113	547	15.2	2.8
636401	58,646	166,489	3,127	18.8	2.8
646330	817	2,226	52	15.7	2.7
646401	676	1,964	42	16.1	2.9
656300	305	932	40	7.6	3.1
656330	16,031	46,288	1,581	10.1	2.9
656401	7,896	21,579	687	11.5	2.7
666330	4044	12359	318	12.7	3.1
666401	14,912	42,452	1,180	12.6	2.8
666402	8,642	23,344	492	17.6	2.7
Total	120,289	340,746	8,066	14.9	2.8

[a]Includes 9,327 crab (26,274 lbs.) from the CDQ fishery.

Table 13. Daily catch (using fish ticket data) for the CDQ summer commercial king crab harvest, Norton Sound Section, Eastern Bering Sea, June 15 - June 28, 2004.

Date[a]	Landings	Number of Crab	Lbs of Crab Harvested	Cumulative No. of Pots Total (lbs)	Pulled	Average Weight (lbs)	CPUE
17-Jun	1	174	538	538	39	3.1	4.5
18-Jun	2	572	1,576	2,114	70	2.8	8.2
19-Jun	2	969	2,722	4,836	70	2.8	13.8
20-Jun	2	193	527	5,363	80	2.7	2.4
21-Jun	2	1,020	2,950	8,313	76	2.9	13.4
22-Jun	4	1,833	5,191	13,504	127	2.8	14.4
23-Jun	1	300	999	14,503	36	3.3	8.3
25-Jun	2	1,379	3,796	18,299	40	2.8	34.5
27-Jun	1	1,109	3,114	21,413	40	2.8	27.7
28-Jun	2	1,778	4,861	26,274	70	2.7	25.4
	19	9,327	26,274		648	2.8	14.4

[a] The CDQ fishery closed by regulation 6/28 and the last delivery was made 6/28.

Table 14. Length frequencies by shell age of all legal male red king crab sampled during the 2004 Norton Sound summer open access and CDQ commercial fisheries. (Page 1 of 2)

	Legal New Shell Males		Legal Old Shell Males		Total Legal Males	
Carapace Length (mm)	Number	Percent	Number	Percent	Number	Percent
95	0	0.0%	0	0.0%	0	0.0%
96	0	0.0%	0	0.0%	0	0.0%
97	0	0.0%	0	0.0%	0	0.0%
98	0	0.0%	0	0.0%	0	0.0%
99	0	0.0%	0	0.0%	0	0.0%
100	2	0.0%	0	0.0%	2	0.0%
101	9	0.1%	1	0.0%	10	0.1%
102	29	0.3%	0	0.0%	29	0.3%
103	44	0.5%	3	0.0%	47	0.5%
104	91	0.9%	7	0.1%	98	1.0%
105	139	1.4%	3	0.0%	142	1.5%
106	155	1.6%	10	0.1%	165	1.7%
107	277	2.9%	17	0.2%	294	3.1%
108	356	3.7%	21	0.2%	377	3.9%
109	412	4.3%	21	0.2%	433	4.5%
110	471	4.9%	34	0.4%	505	5.3%
111	599	6.2%	37	0.4%	636	6.6%
112	598	6.2%	56	0.6%	654	6.8%
113	562	5.9%	39	0.4%	601	6.3%
114	478	5.0%	43	0.4%	521	5.4%
115	500	5.2%	34	0.4%	534	5.6%
116	490	5.1%	38	0.4%	528	5.5%
117	496	5.2%	47	0.5%	543	5.7%
118	327	3.4%	33	0.3%	360	3.7%
119	339	3.5%	33	0.3%	372	3.9%
120	318	3.3%	29	0.3%	347	3.6%
121	292	3.0%	32	0.3%	324	3.4%
122	303	3.2%	23	0.2%	326	3.4%
123	184	1.9%	21	0.2%	205	2.1%
124	145	1.5%	16	0.2%	161	1.7%
125	151	1.6%	22	0.2%	173	1.8%
126	144	1.5%	18	0.2%	162	1.7%
127	144	1.5%	16	0.2%	160	1.7%
128	83	0.9%	14	0.1%	97	1.0%
129	86	0.9%	13	0.1%	99	1.0%
130	69	0.7%	15	0.2%	84	0.9%

(continued)

Table 14. (Page 2 of 2)

	Legal New Shell Males		Legal Old Shell Males		Total Legal Males	
Carapace Length (mm)	Number	Percent	Number	Percent	Number	Percent
131	85	0.9%	9	0.1%	94	1.0%
132	58	0.6%	12	0.1%	70	0.7%
133	51	0.5%	8	0.1%	59	0.6%
134	39	0.4%	11	0.1%	50	0.5%
135	43	0.4%	5	0.1%	48	0.5%
136	36	0.4%	8	0.1%	44	0.5%
137	32	0.3%	6	0.1%	38	0.4%
138	34	0.4%	7	0.1%	41	0.4%
139	17	0.2%	3	0.0%	20	0.2%
140	25	0.3%	4	0.0%	29	0.3%
141	19	0.2%	5	0.1%	24	0.2%
142	11	0.1%	3	0.0%	14	0.1%
143	12	0.1%	3	0.0%	15	0.2%
144	10	0.1%	0	0.0%	10	0.1%
145	10	0.1%	0	0.0%	10	0.1%
146	2	0.0%	2	0.0%	4	0.0%
147	9	0.1%	2	0.0%	11	0.1%
148	2	0.0%	0	0.0%	2	0.0%
149	3	0.0%	0	0.0%	3	0.0%
150	1	0.0%	0	0.0%	1	0.0%
151	2	0.0%	0	0.0%	2	0.0%
152	3	0.0%	0	0.0%	3	0.0%
153	3	0.0%	2	0.0%	5	0.1%
154	1	0.0%	2	0.0%	3	0.0%
155	1	0.0%	0	0.0%	1	0.0%
156	2	0.0%	1	0.0%	3	0.0%
157	0	0.0%	1	0.0%	1	0.0%
158	1	0.0%	1	0.0%	2	0.0%
159	1	0.0%	1	0.0%	2	0.0%
160	1	0.0%	0	0.0%	1	0.0%
161	1	0.0%	1	0.0%	2	0.0%
162	0	0.0%	0	0.0%	0	0.0%
163	0	0.0%	0	0.0%	0	0.0%
164	0	0.0%	0	0.0%	0	0.0%
165	0	0.0%	0	0.0%	0	0.0%
166+	3	0.0%	1	0.0%	4	0.0%
Totals	8,811	91.7%	794	8.3%	9,605	100.0%
Average Lengths	116.2		119.1		116.5	

Total Recruits <116mm	4,722	49.2%
Total Postrecruits ≥ 116mm and all legal old shell males =	4,883	50.8%

Table 15. Winter 2003-2004 subsistence red king crab catches and effort by gear type, Norton Sound District.

Gear Type	# Permits Fished[a,b]	# Males Caught	# Males Kept	# Females Caught	# Females Kept	Total Crab Captured	Total Crab Kept	Average Harvest per Fisher
Pots	32	1,357	976	163	8	1,520	984	31
Handlines	1	1	1	1	0	2	1	1
Both	33	1,358	977	164	8	1,522	985	30
Unknown	8	208	191	45	6	253	197	25
Totals	41	1,566	1,168	209	14	1,775	1,182	29

[a] Number of permits given out = 96
[b] Number of permits returned = 77

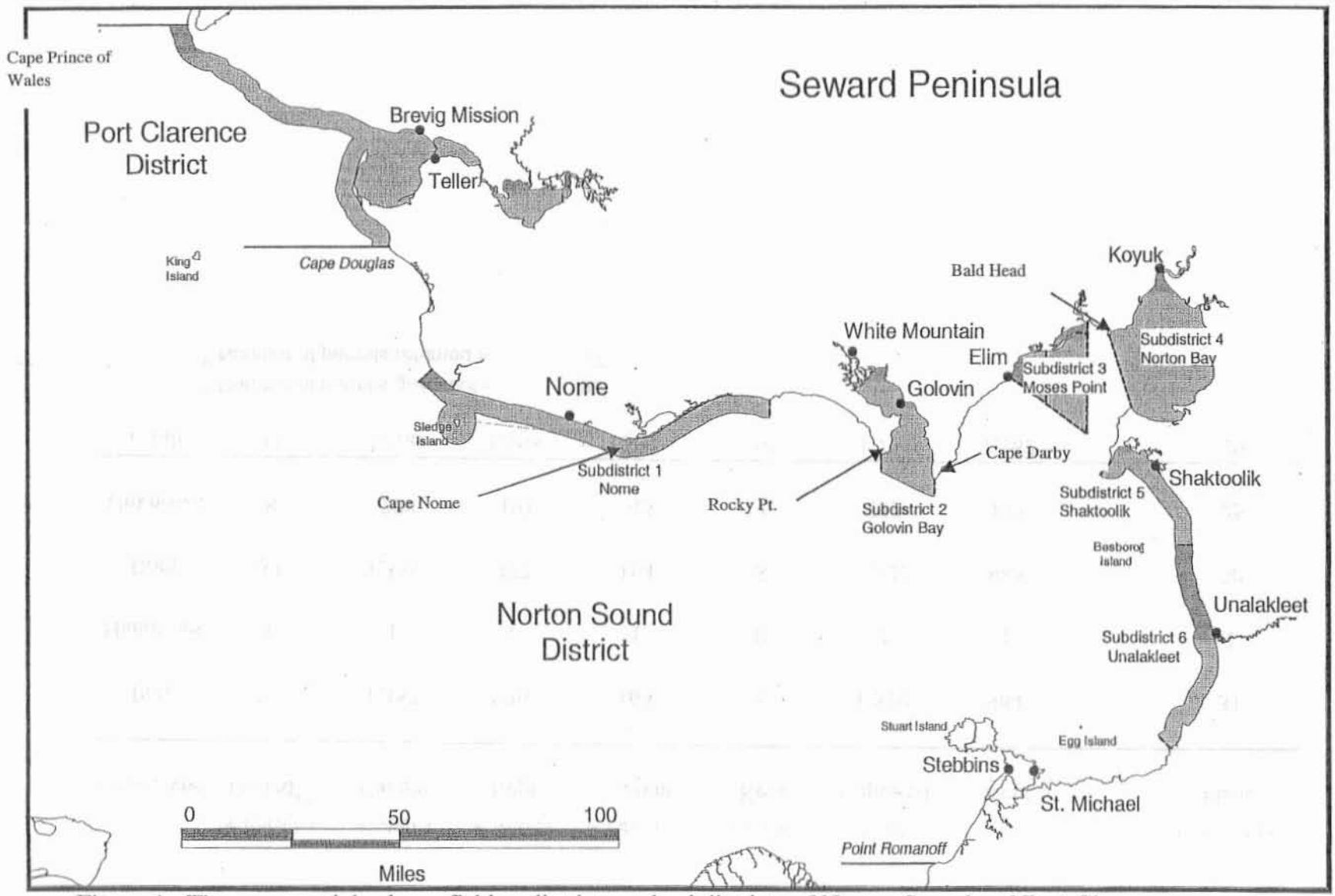

Figure 1. The commercial salmon fishing districts and subdistricts of Norton Sound and Port Clarence.

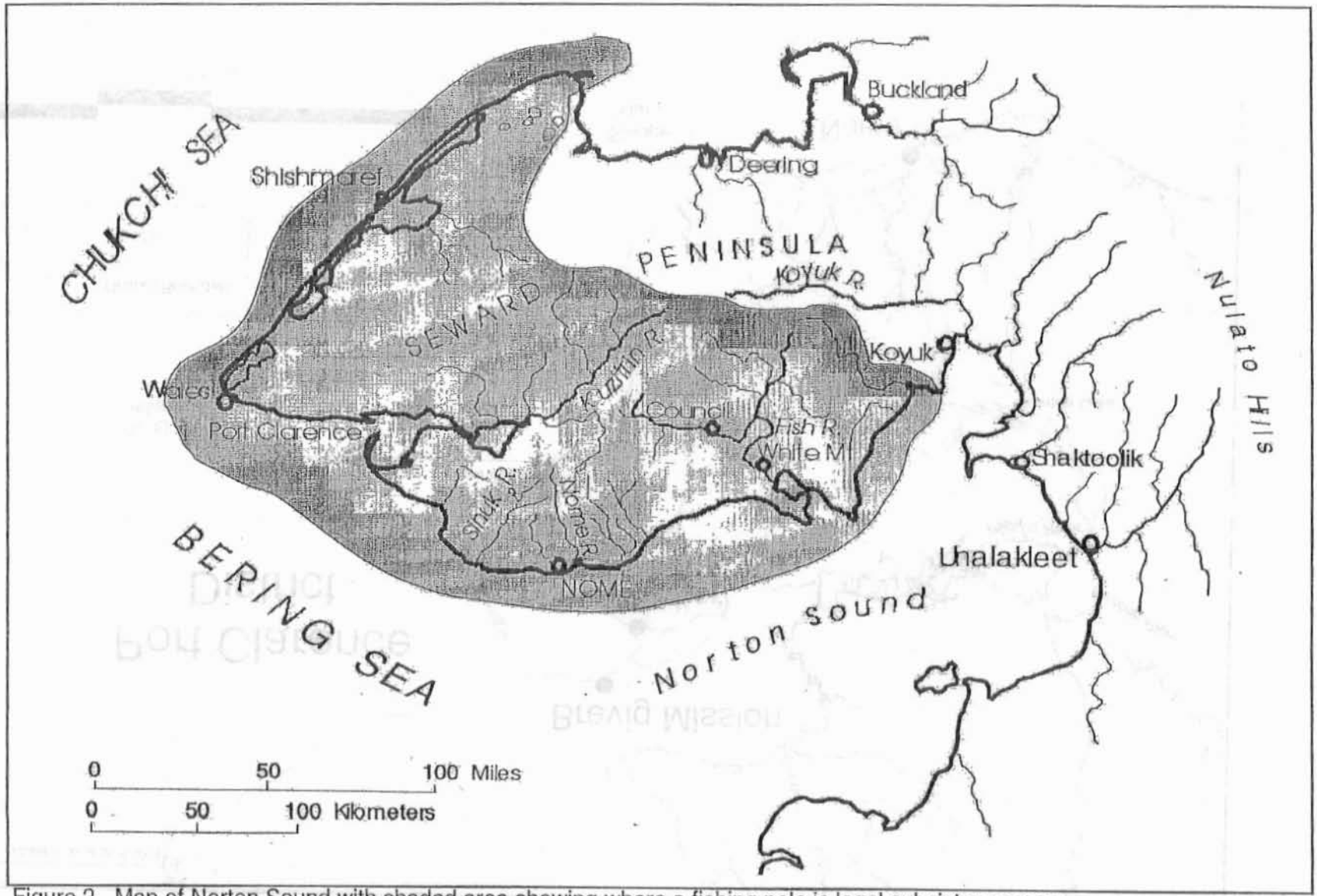

Figure 2. Map of Norton Sound with shaded area showing where a fishing pole is legal subsistence gear.

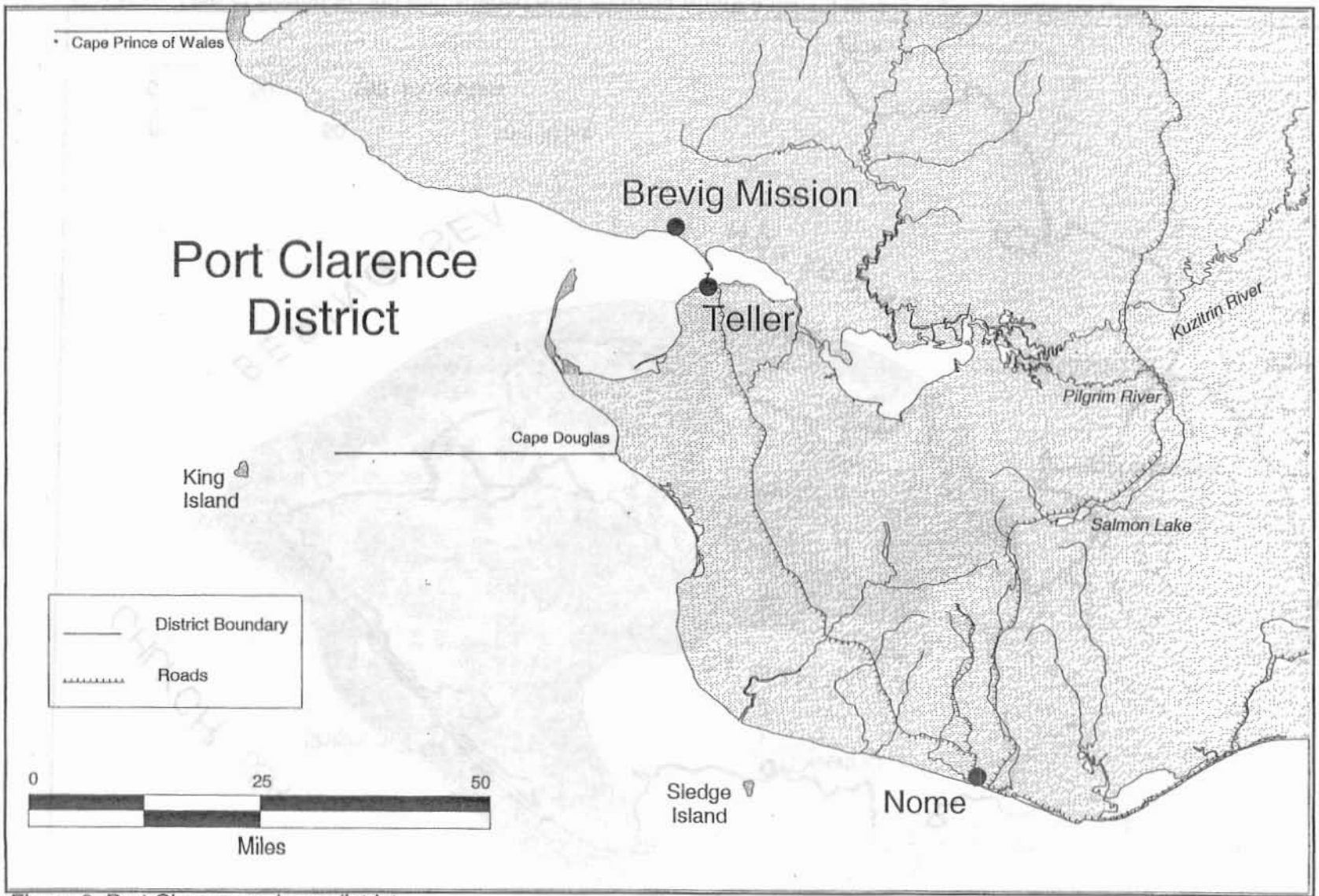

Figure 3. Port Clarence salmon district.

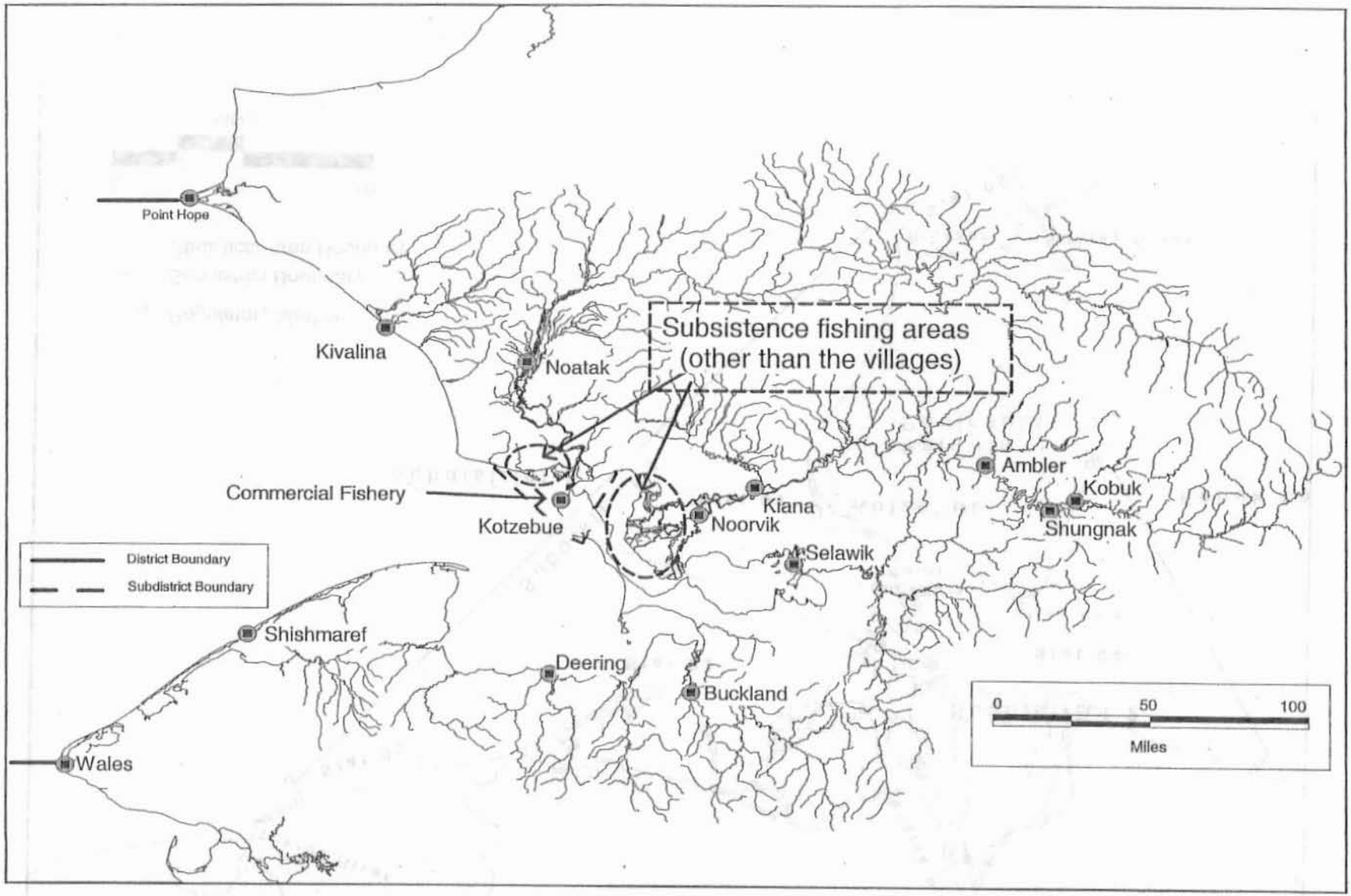

Figure 4. Kotzebue Sound salmon district, villages, and subsistence fishing areas.

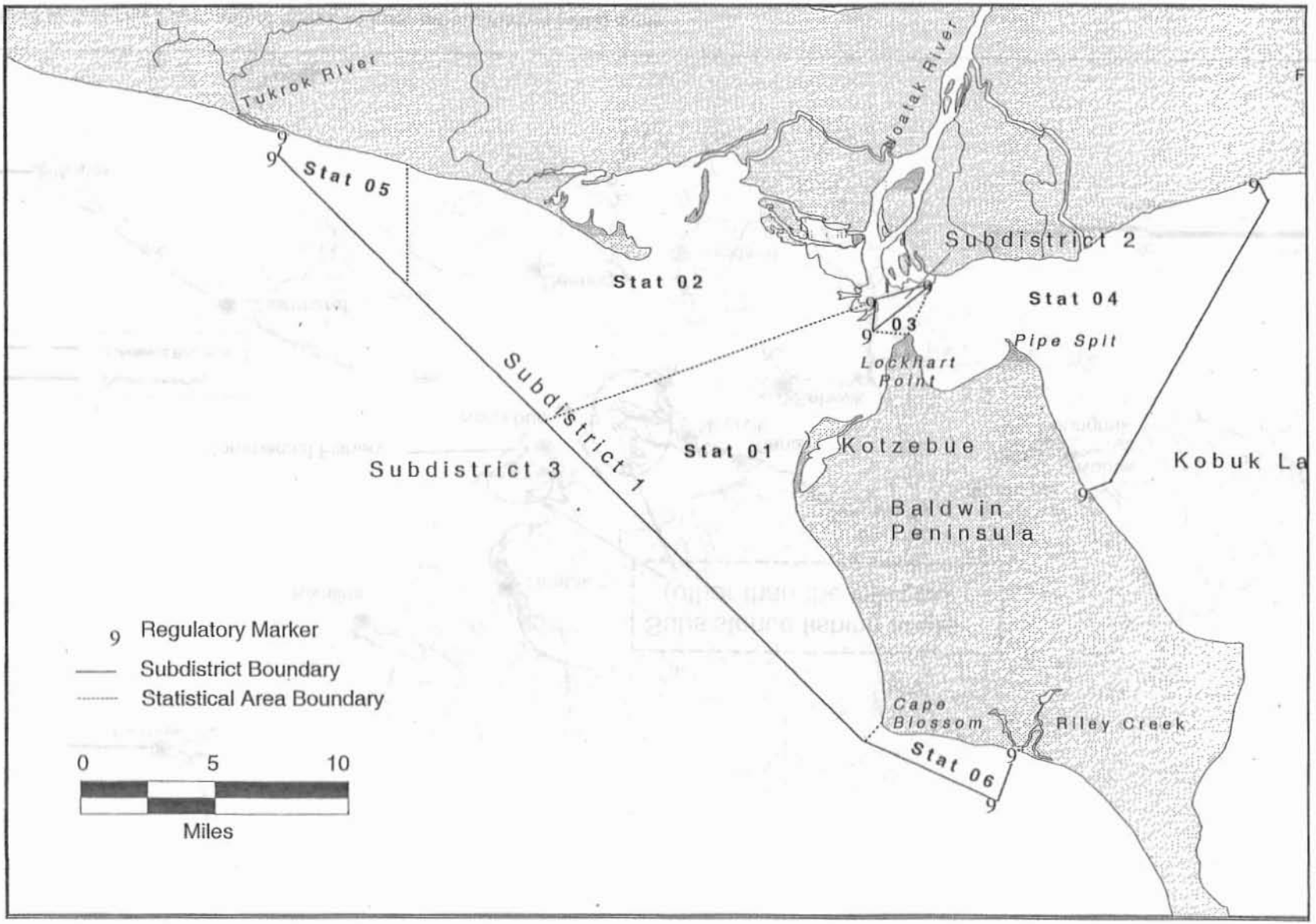

Figure 5. Kotzebue Sound salmon fishing subdistricts and statistical areas.

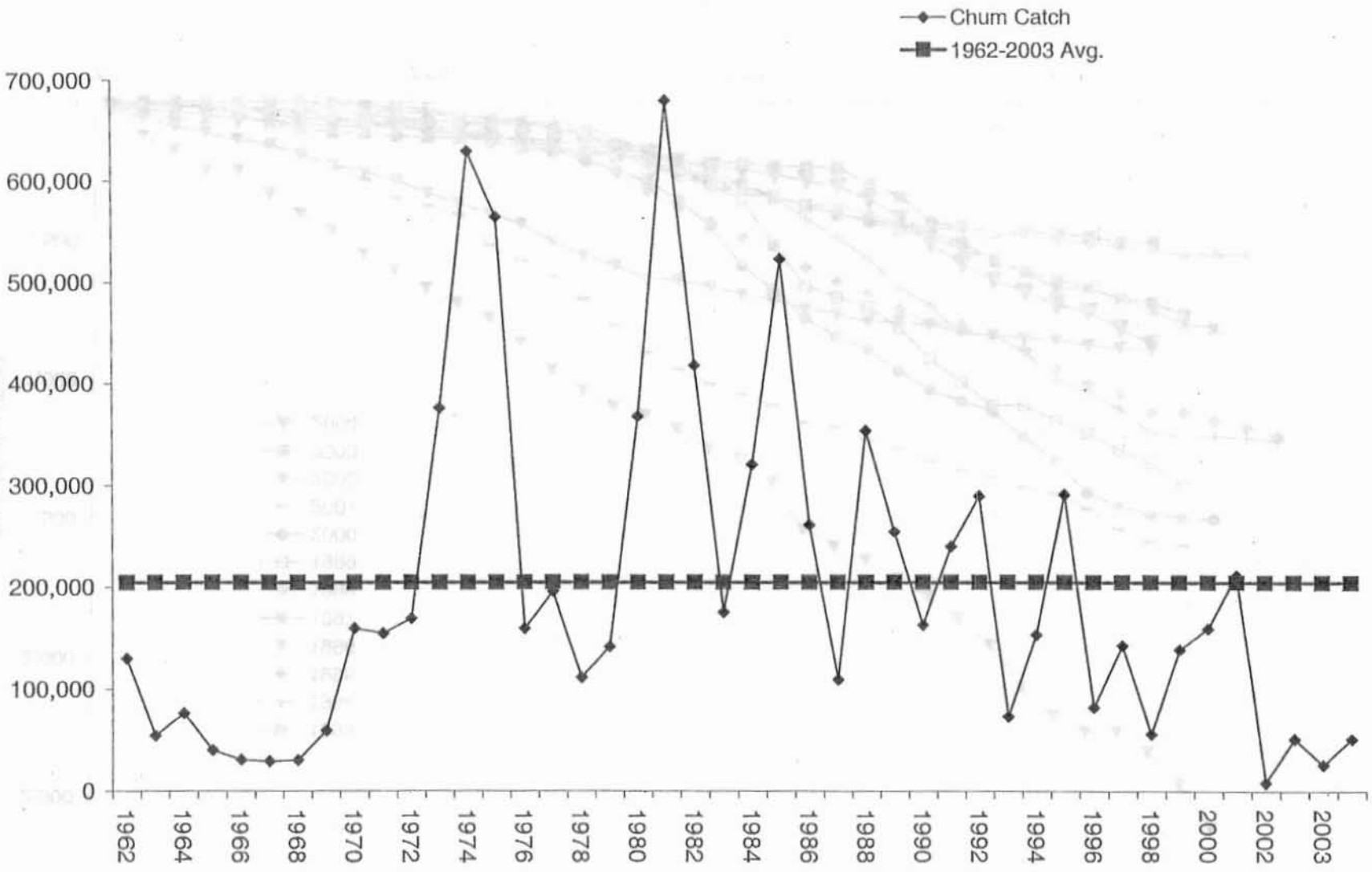

Figure 6. Kotzebue Sound commercial chum salmon catch and historical average, 1962-2004.

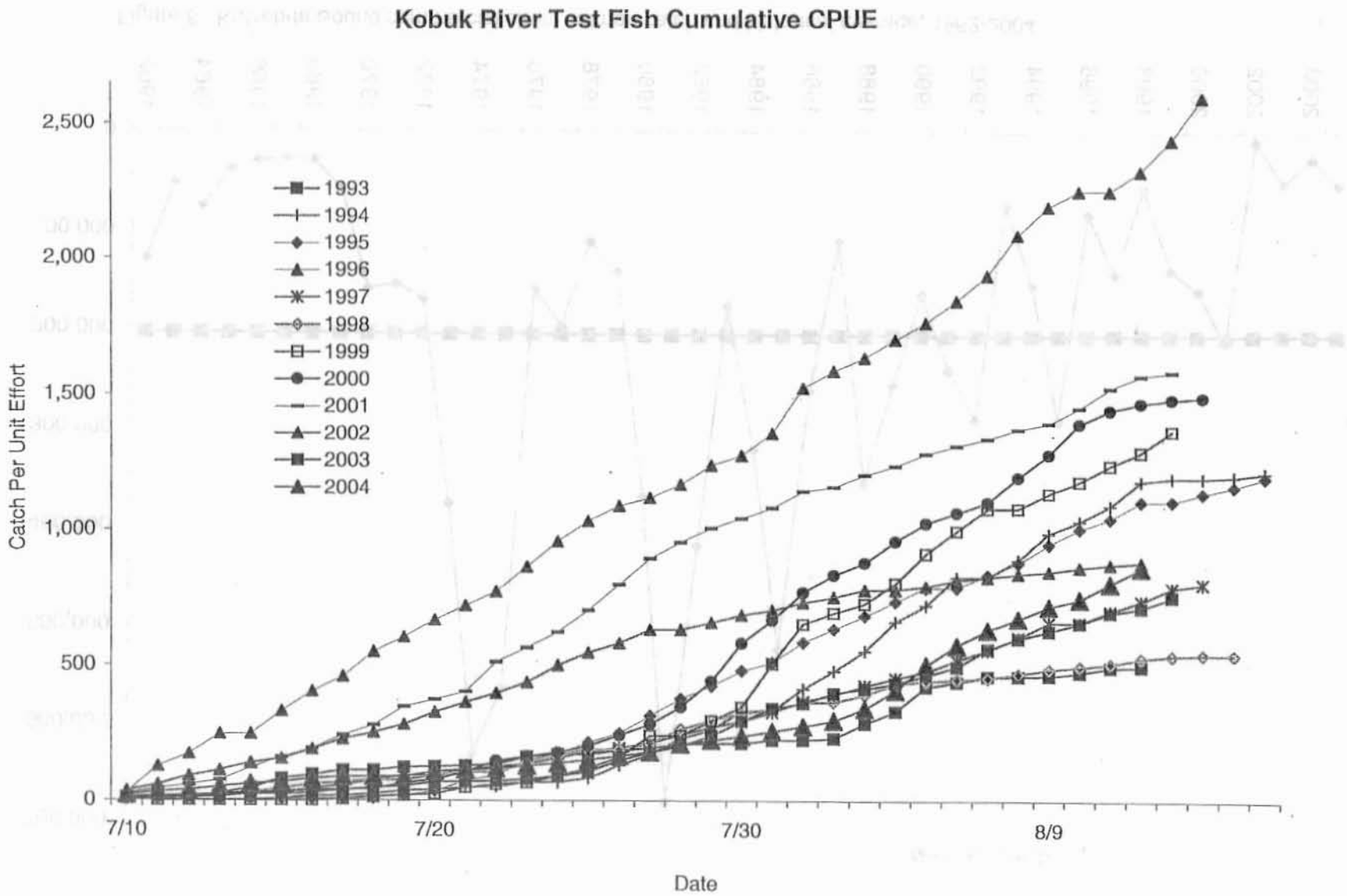

Figure 7. Kobuk River chum salmon drift test fish cumulative Catch Per Unit Effort (CPUE), 1993-2004.

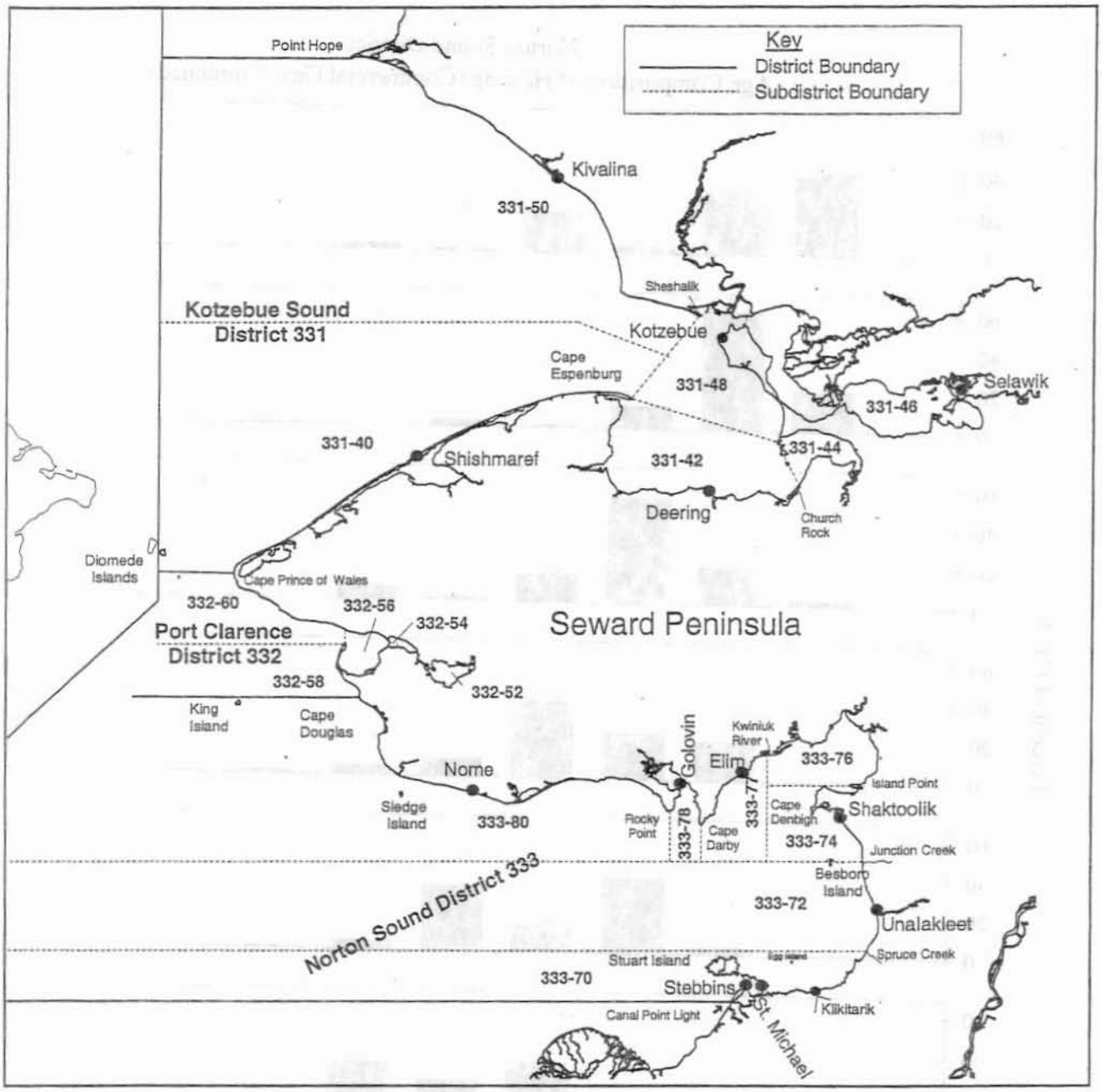

Figure 8. Statistical areas of the Norton Sound, Port Clarence and Kotzebue Sound commercial herring fishing districts.

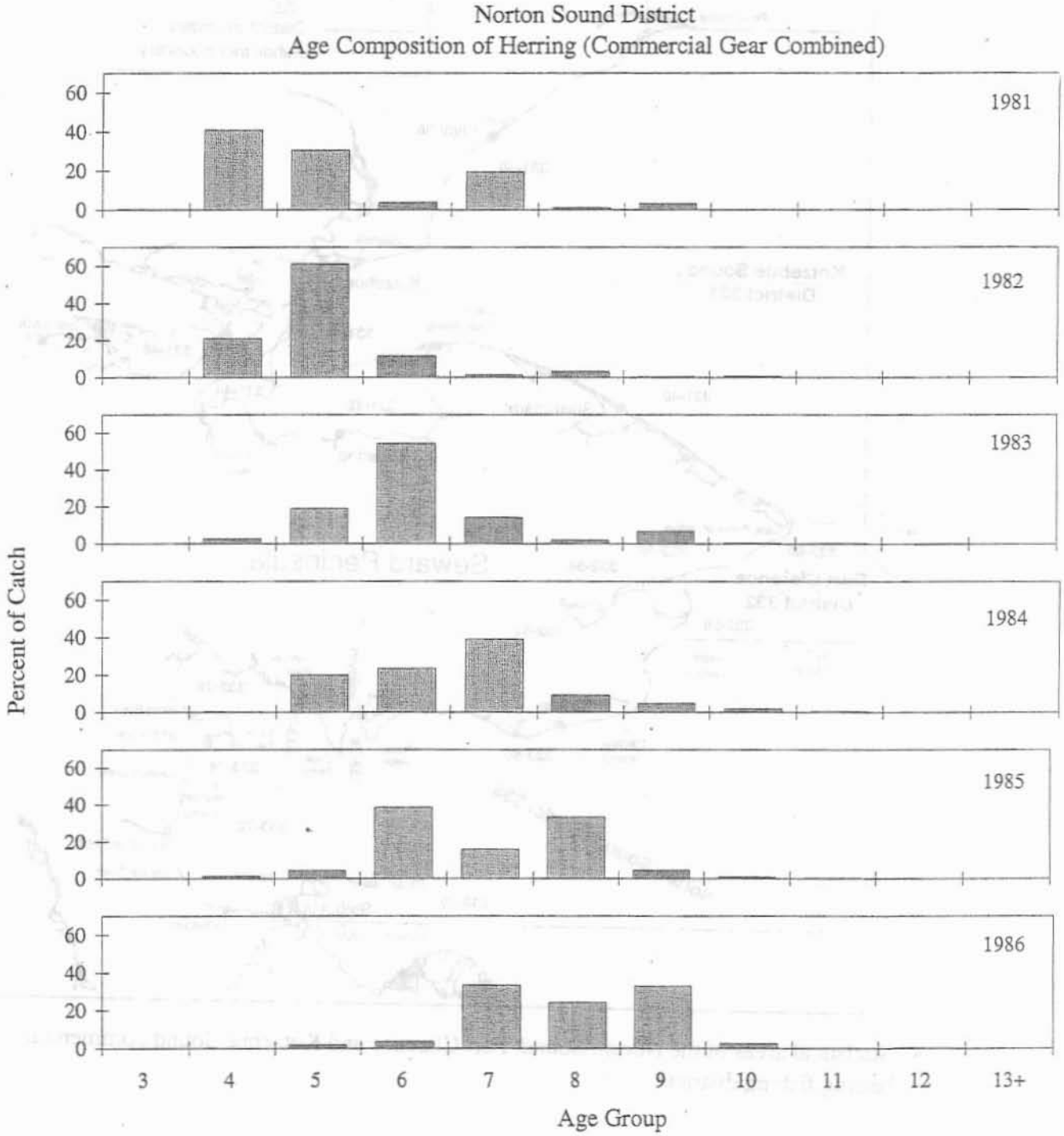

Figure 9. Norton Sound herring age class composition by percentage of commercial catch, commercial gear combined (beach seine and gillnet), 1981-2004. (page 1 of 4)

Norton Sound District
Age Composition of Herring (Commercial Gear Combined)

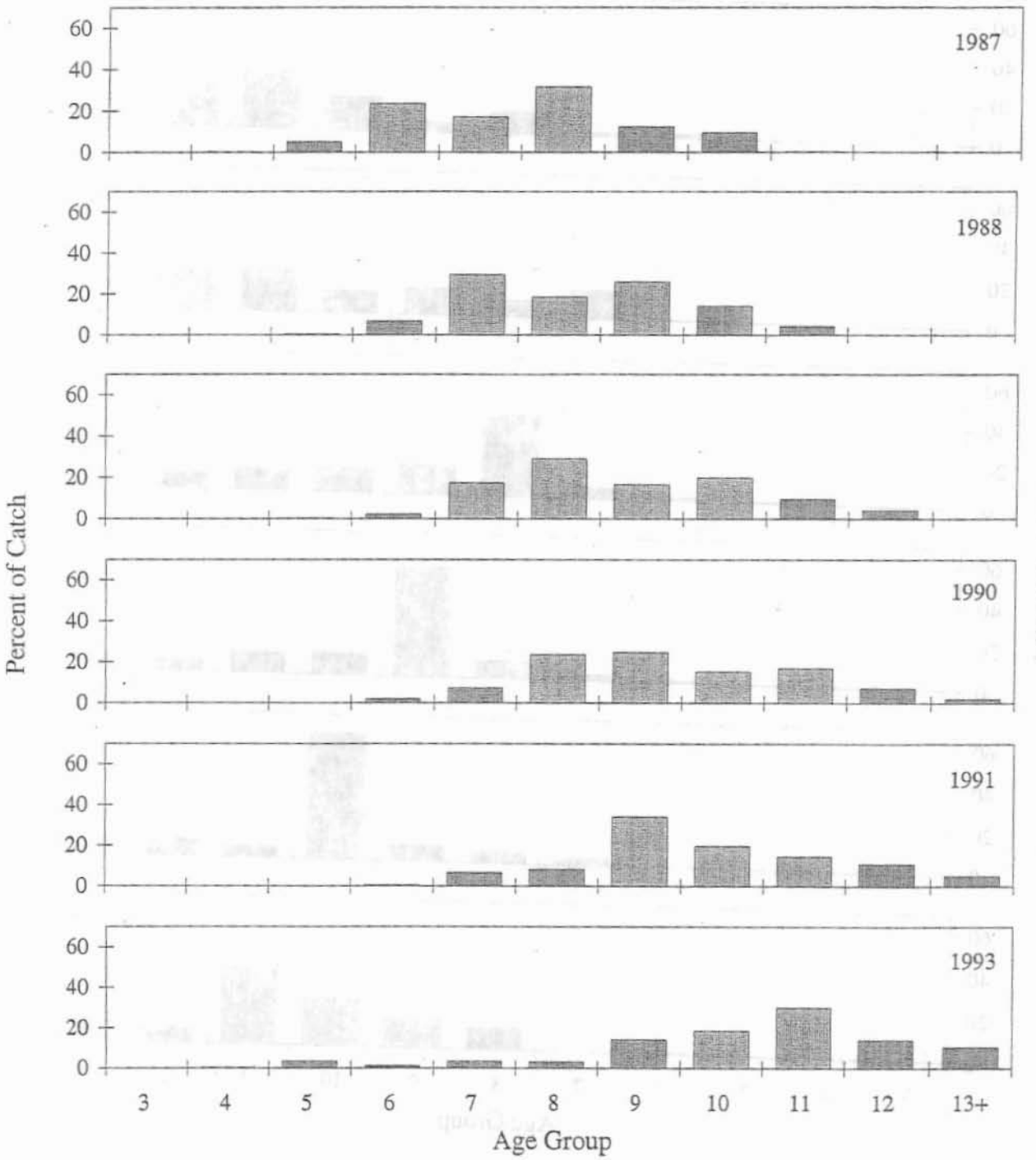

Figure 9. (page 2 of 4)
note: No commercial fishing occurred in 1992.

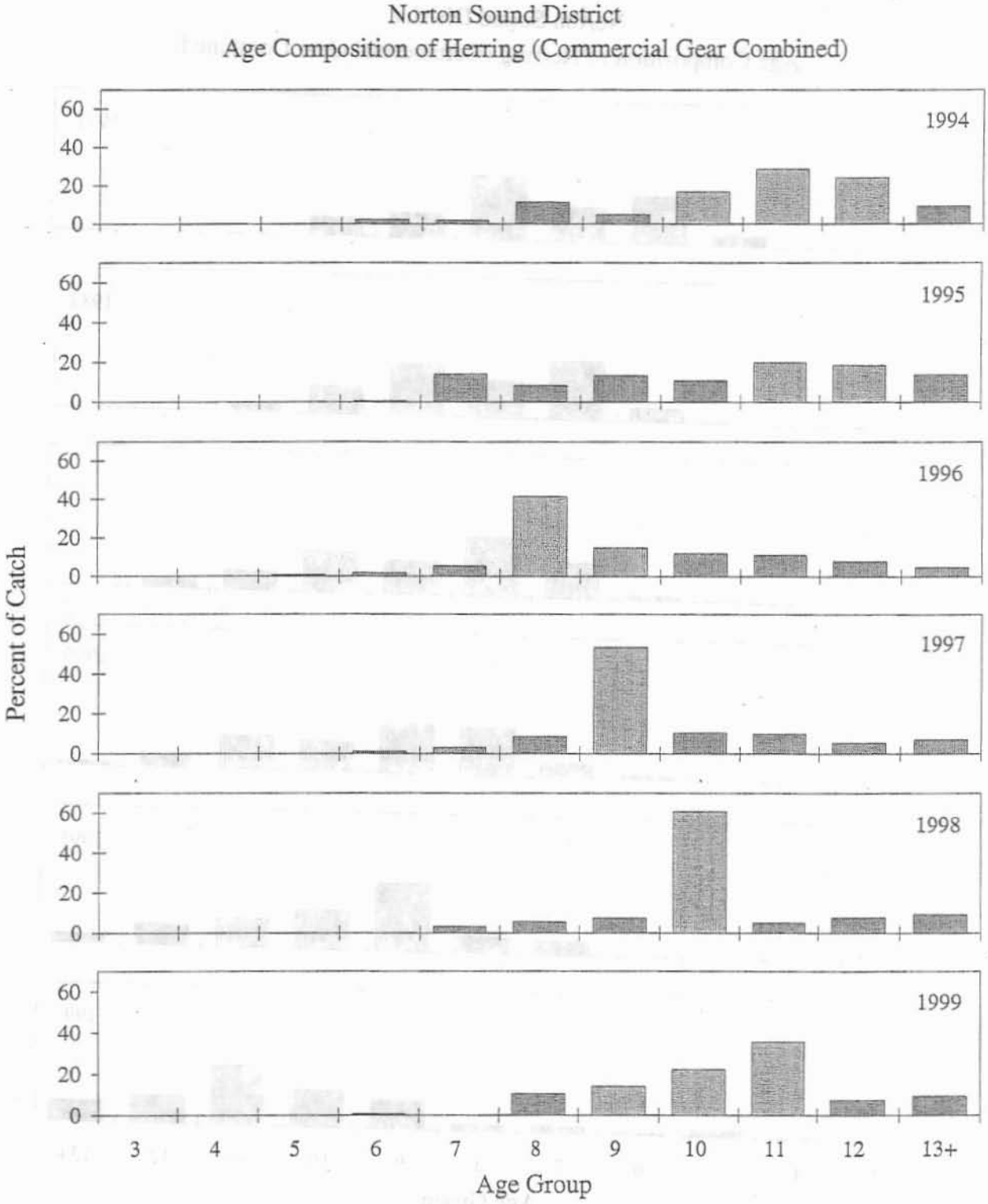

Figure 9. (page 3 of 4)
Note: No commercial catch from beach seine gear in 1998 and 1999.

Norton Sound District

Age Composition of Herring (Commercial Gear Combined)

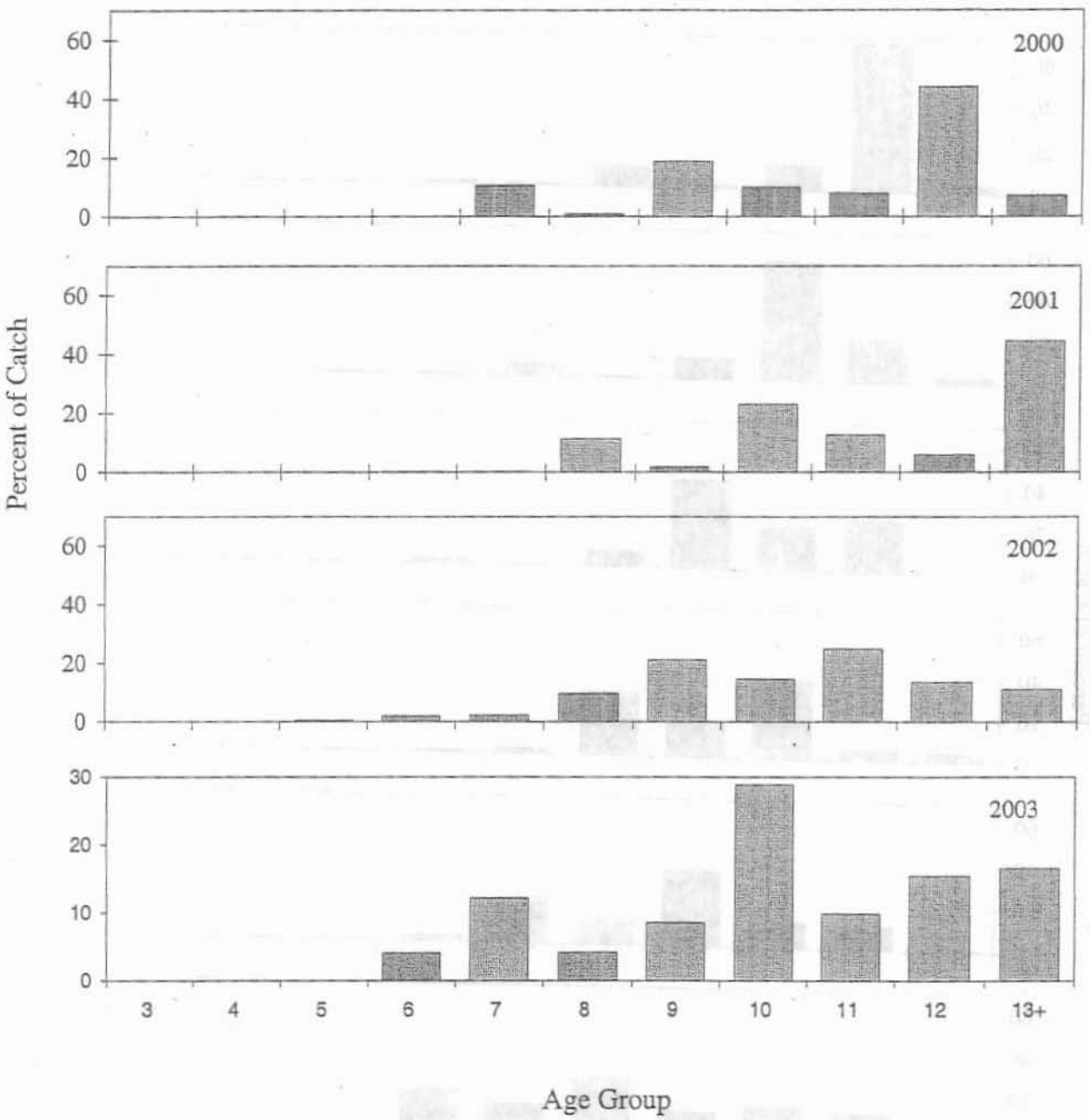

Figure 9. (page 4 of 4)
Note: No commercial catch from beach seine gear in 2001 - 2003. No fishery in 2004.

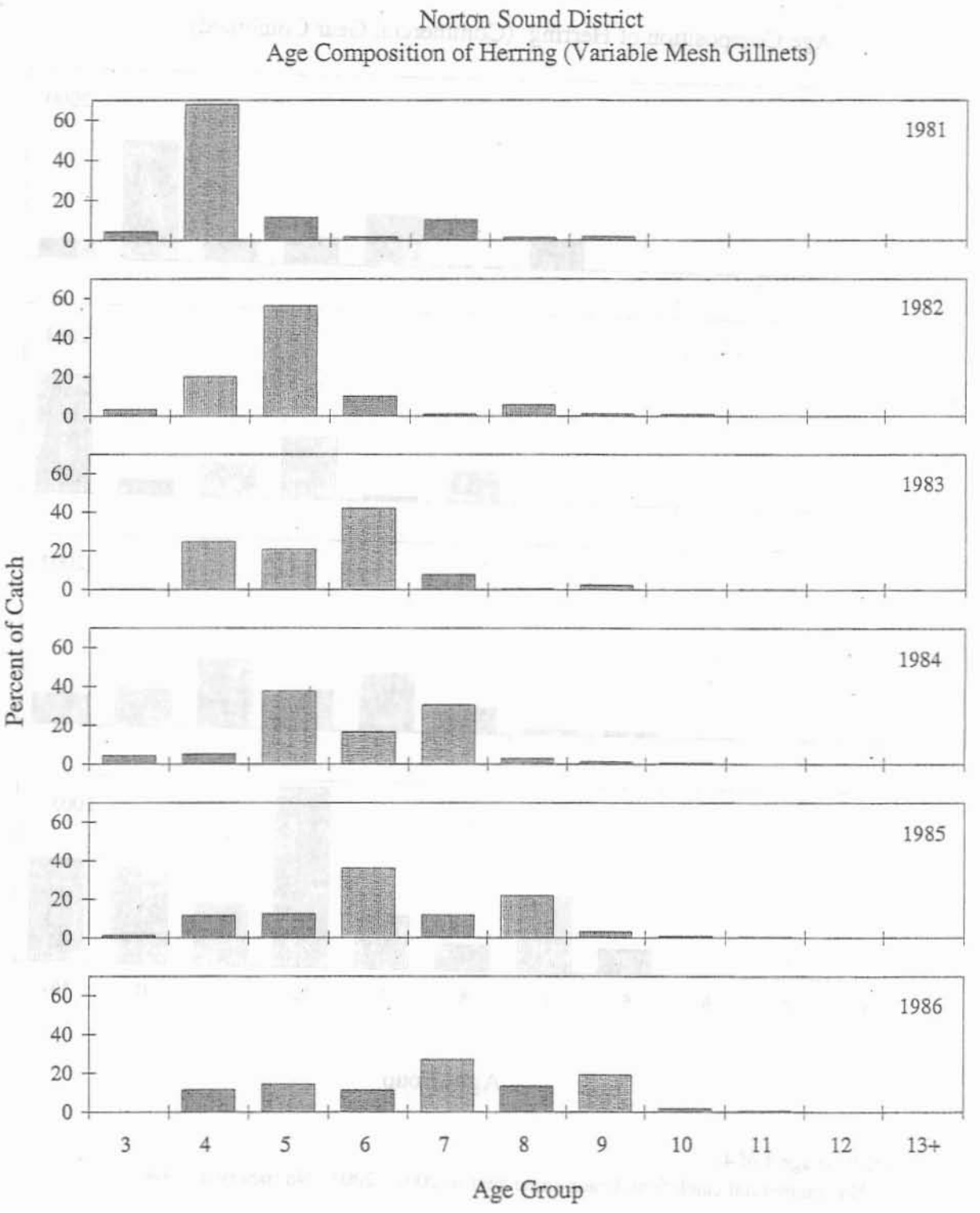

Figure 10. Norton Sound herring age class composition by percentage of total catch, variable mesh gillnets, 1981-2004. (Page 1 of 4)

Norton Sound District
Age Composition of Herring (Variable Mesh Gillnets)

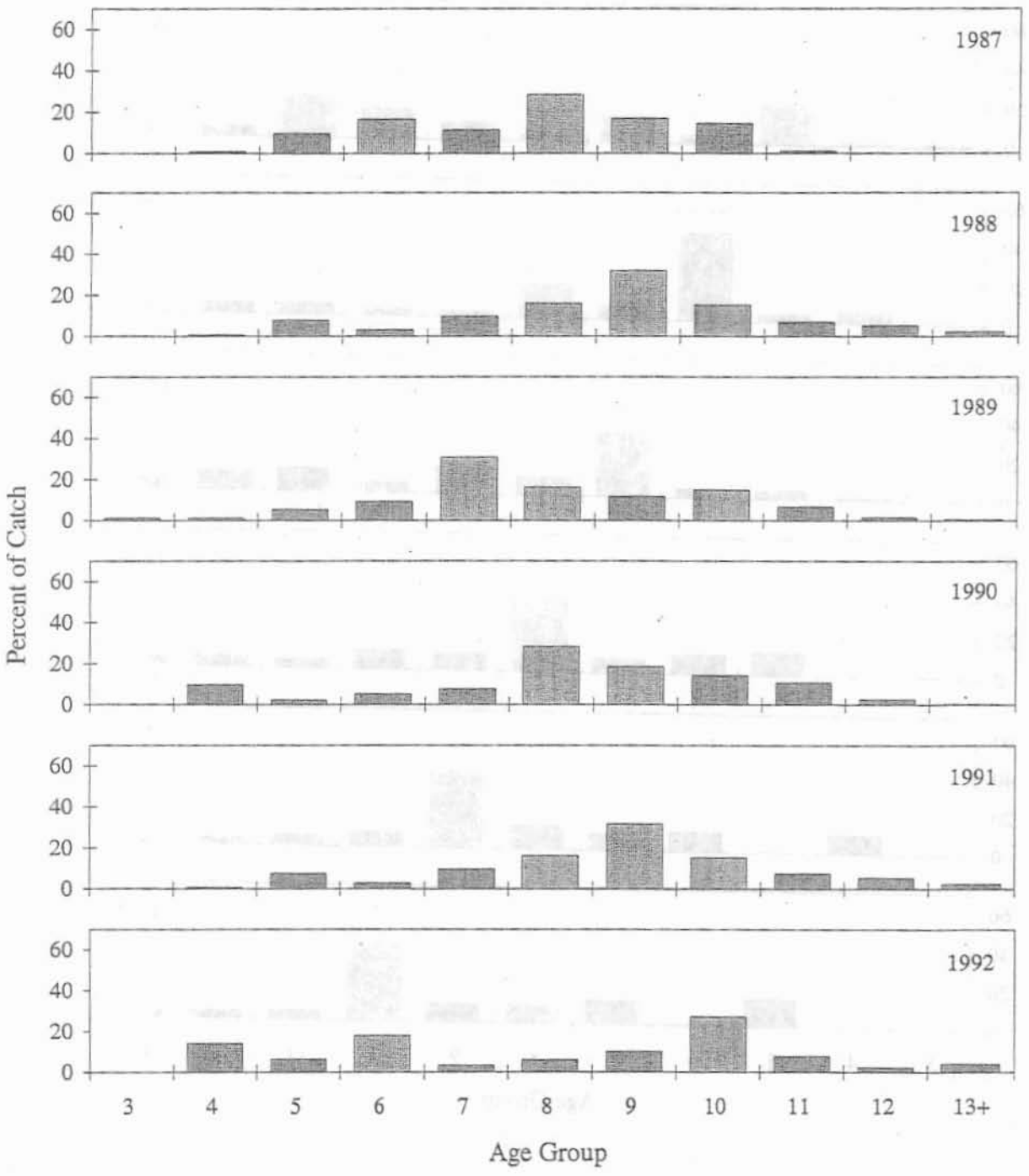

Figure 10. (Page 2 of 4)

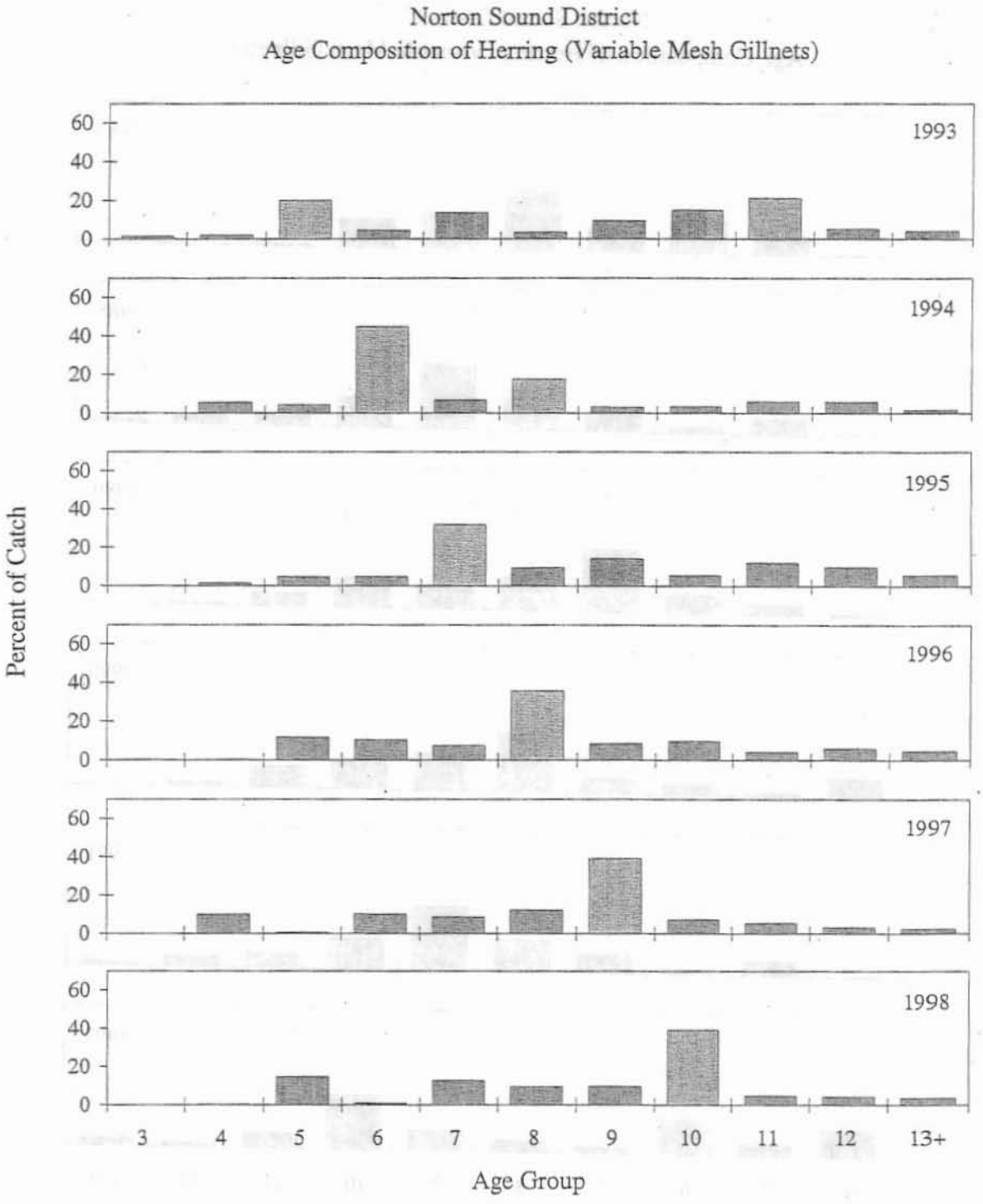

Figure 10. (Page 3 of 4)

Norton Sound District
Age Composition of Herring (Variable Mesh Gillnets)

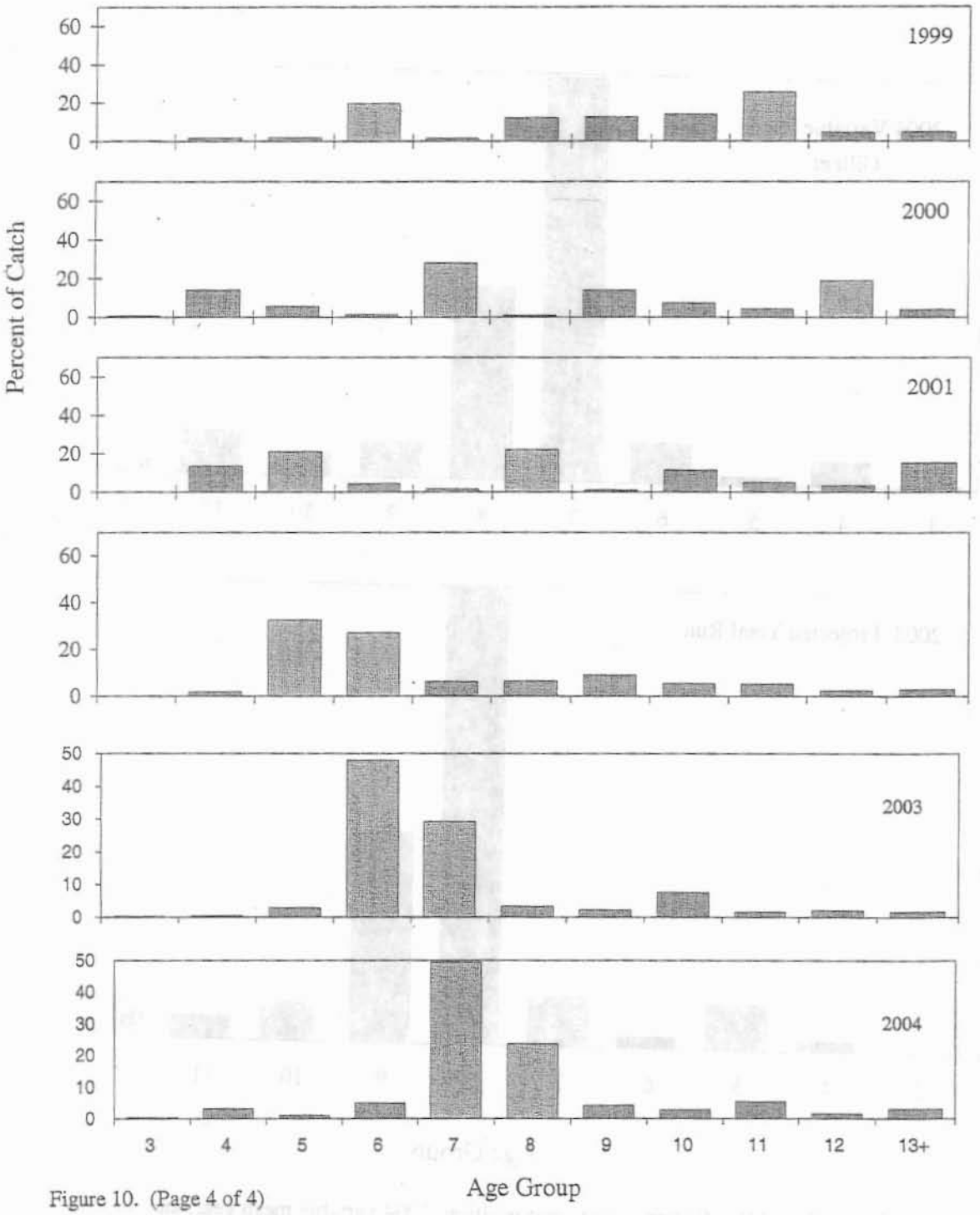

Figure 10. (Page 4 of 4)

NORTON SOUND HERRING
2004 Catch and the 2005 Projection

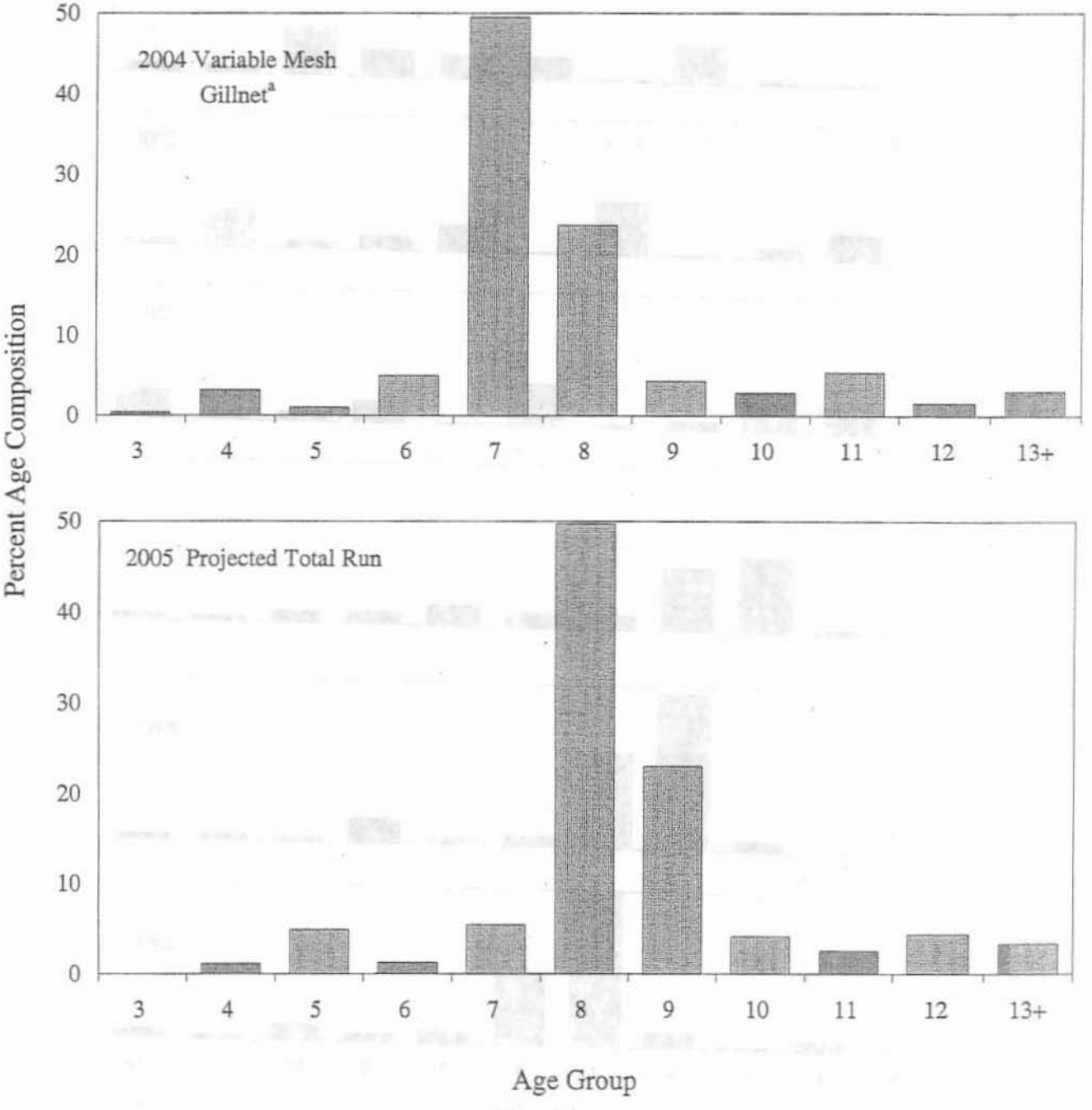

Figure 11. Norton Sound Pacific herring age composition, 2004 variable mesh gear, and the projected age composition of the 2005 return.
[a] No commercial fishery occurred in 2004

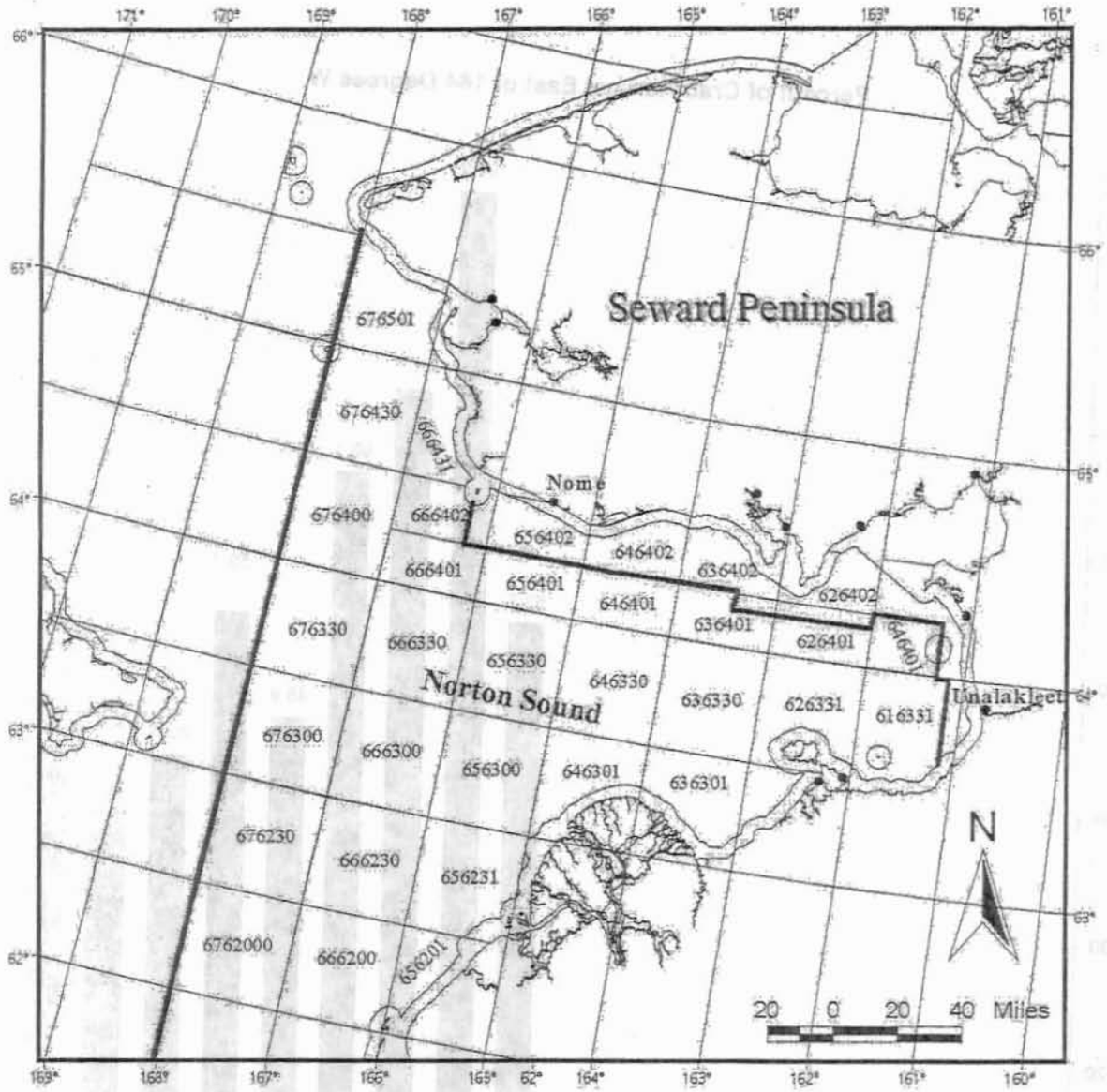

Figure 12. Statistical areas for the Norton Sound red king crab fishery.

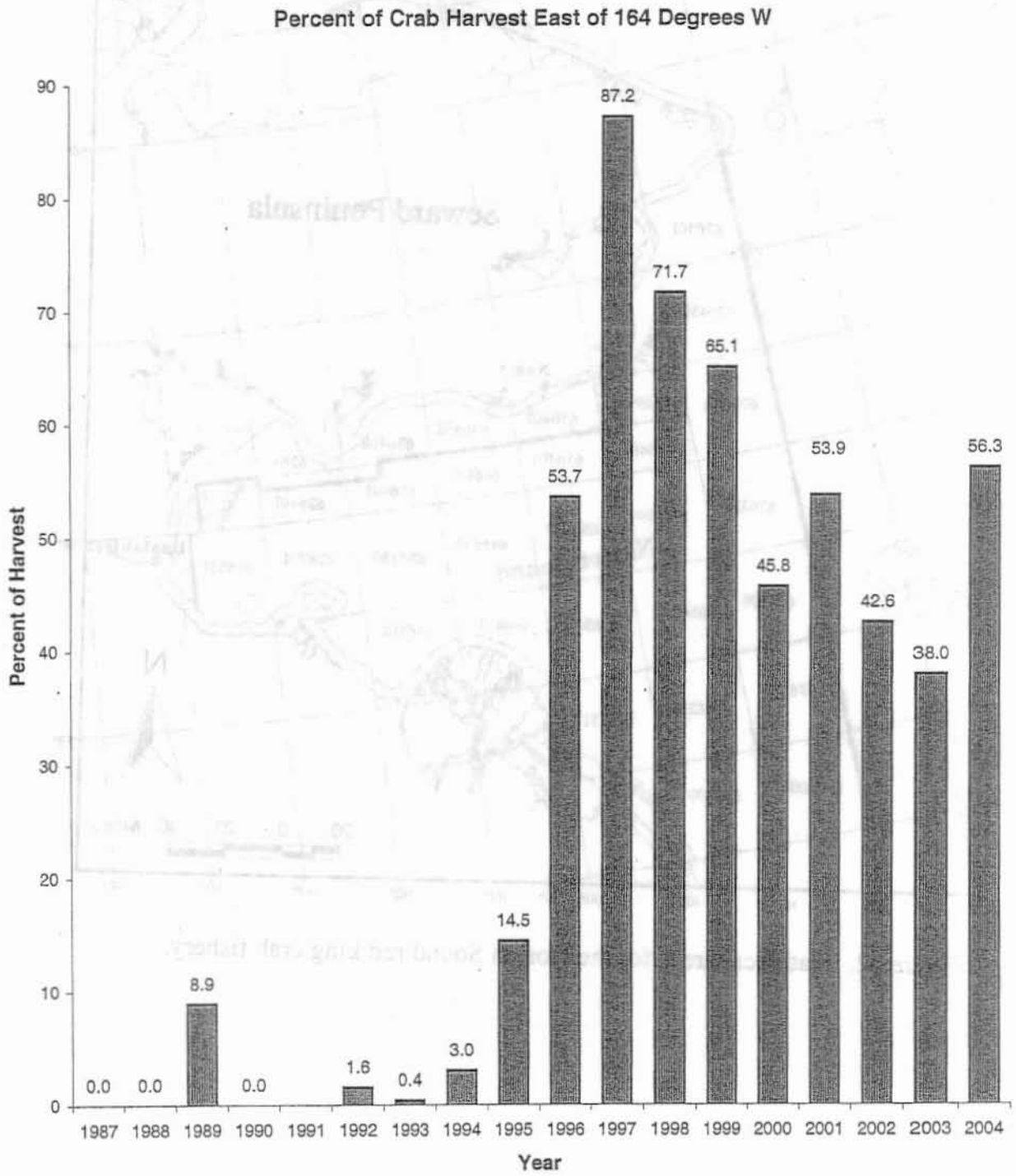

Figure 13. The percent of crab harvested during the Norton Sound summer commercial red king crab fishery east of the 164 degrees west longitude, 1987 - 2004.

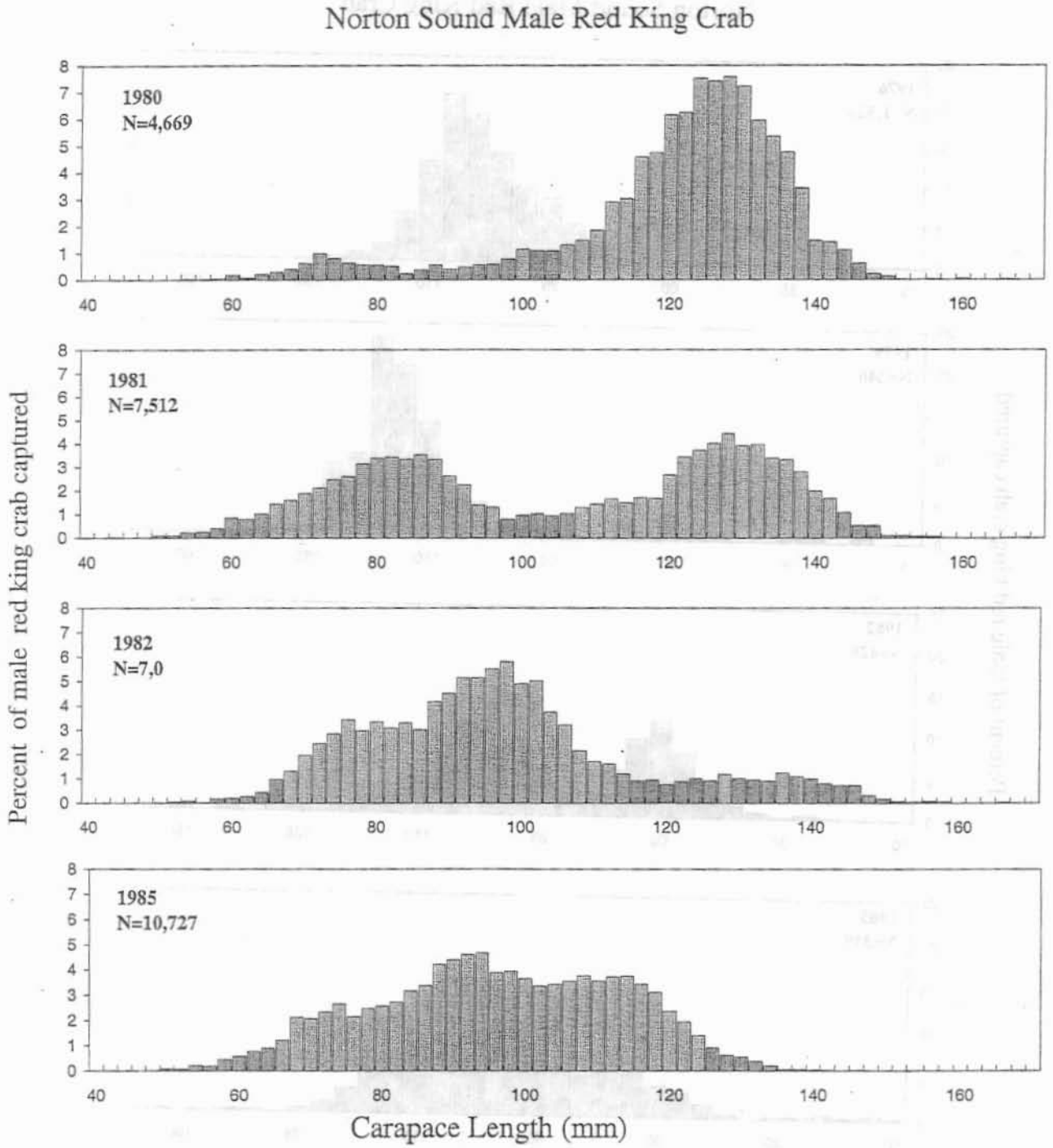

Figure 14. Norton Sound male red king crab size distribution from pot assessment surveys conducted by the Alaska Department of Fish and Game, 1980, 1981, 1982, and 1985.

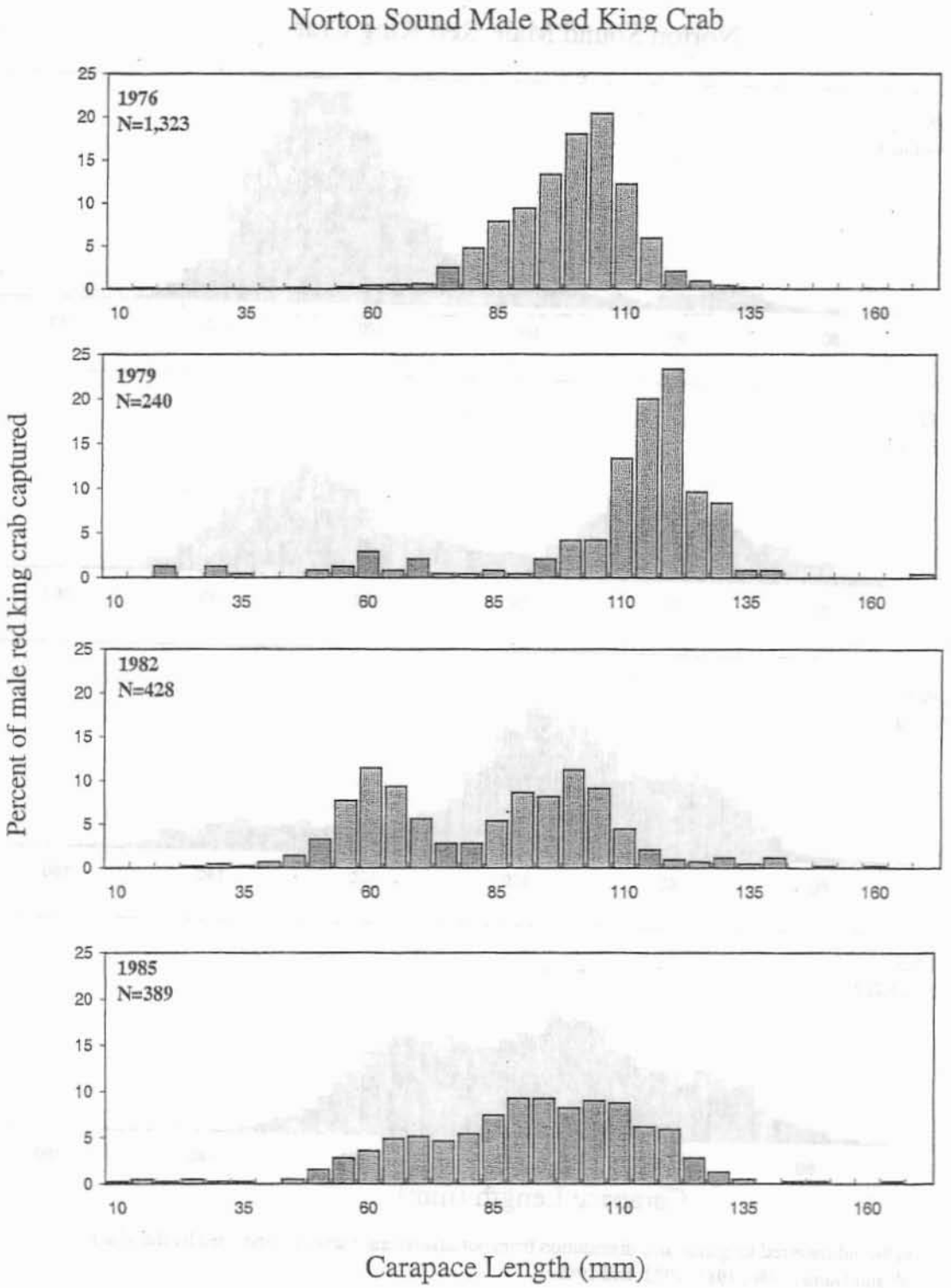

Figure 15. Norton Sound male red king crab size distribution from trawl assessment surveys conducted by the National Marine Fisheries Service, 1976, 1979, 1982, 1985, 1988, 1991, and by ADF&G in 1996, 1999, and 2002. (Page 1 of 3).

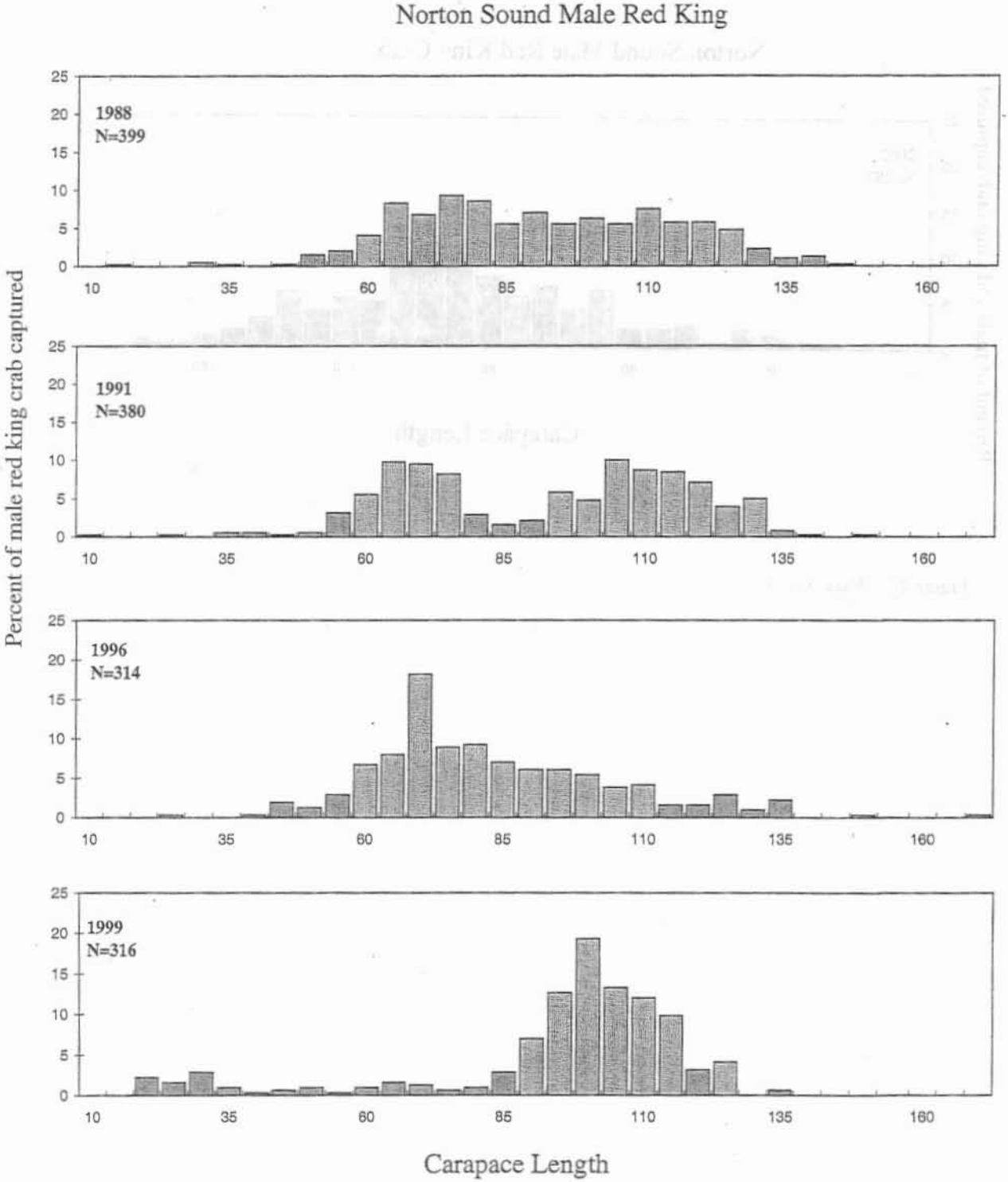

Figure 15. (Page 2 of 3)

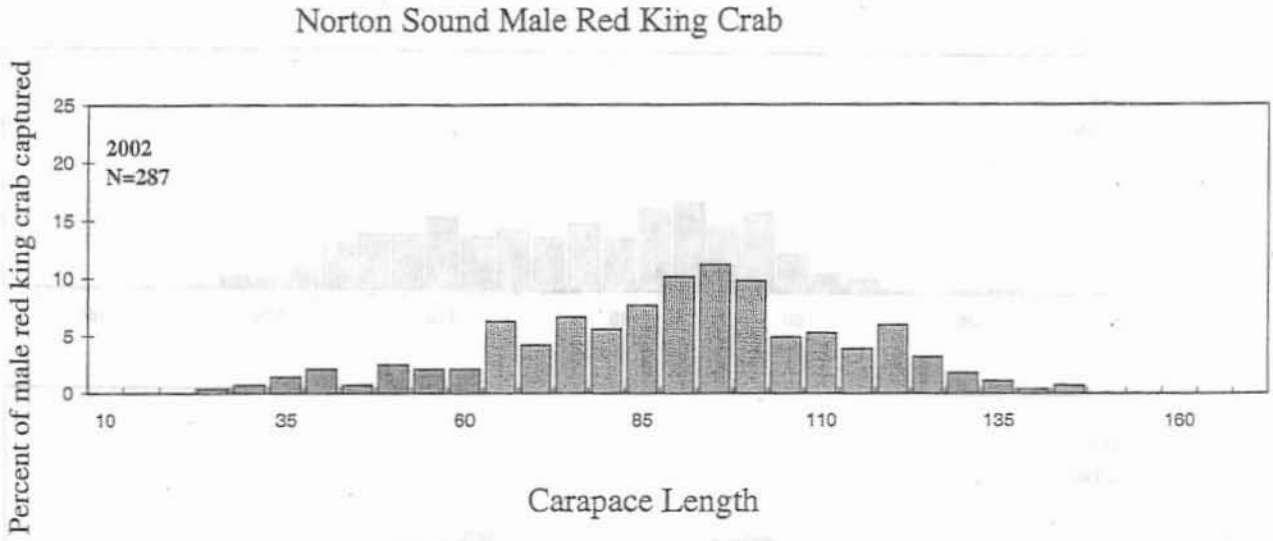

Figure 15. (Page 3 of 3)

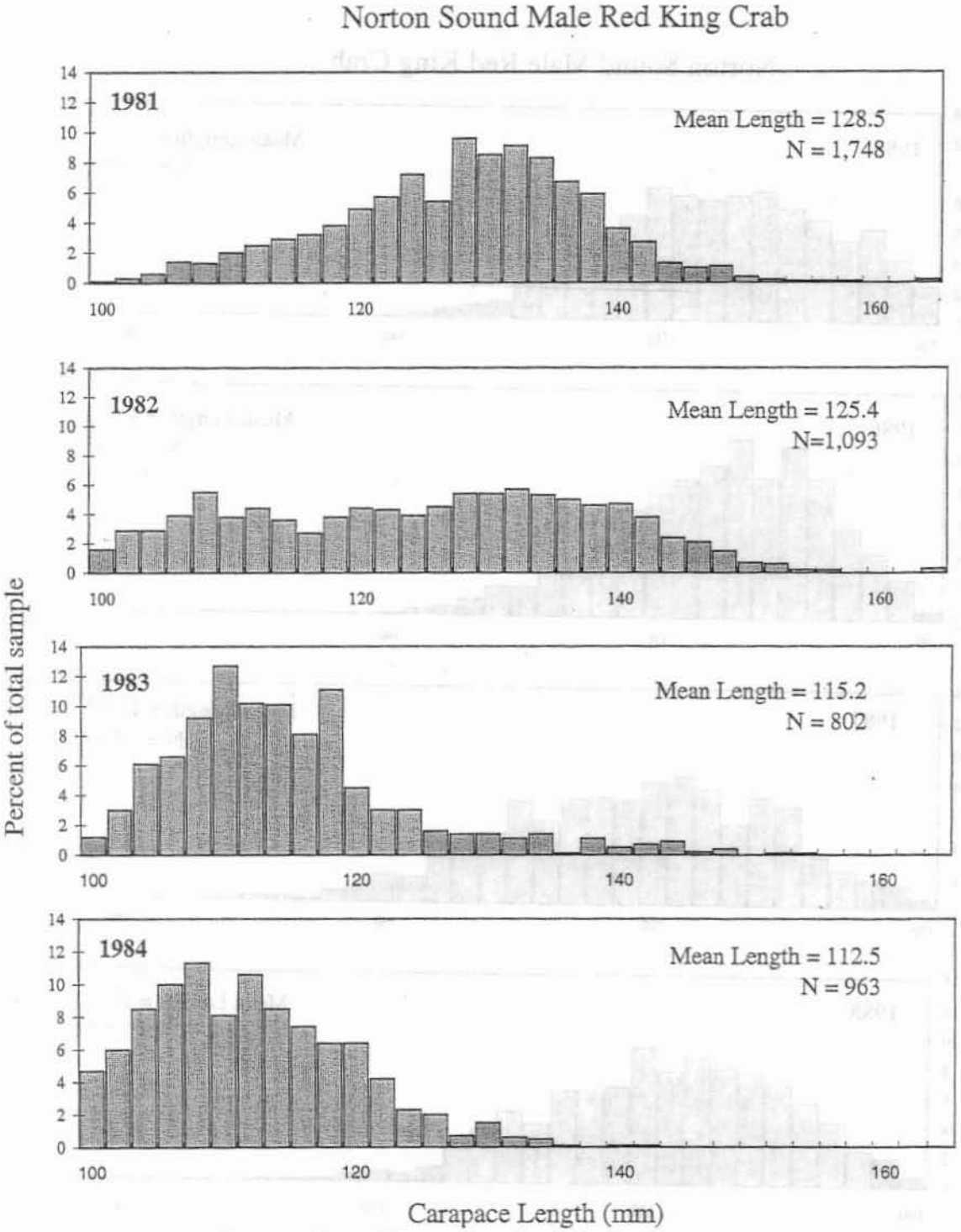

Figure 16. Length composition of Norton Sound red king crab summer commercial harvests, 1981-2004. (Page 1 of 6)

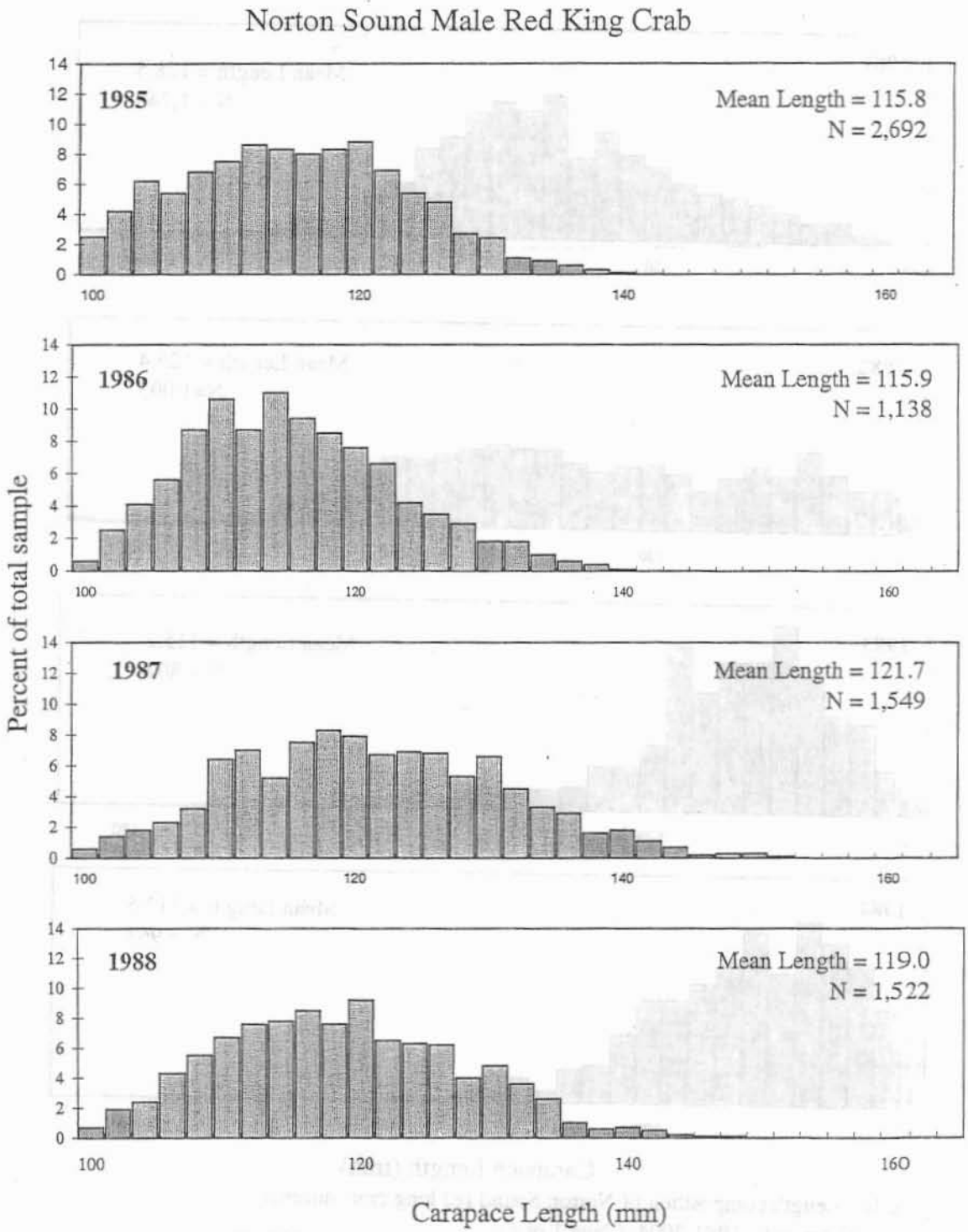

Figure 16. (page 2 of 6)

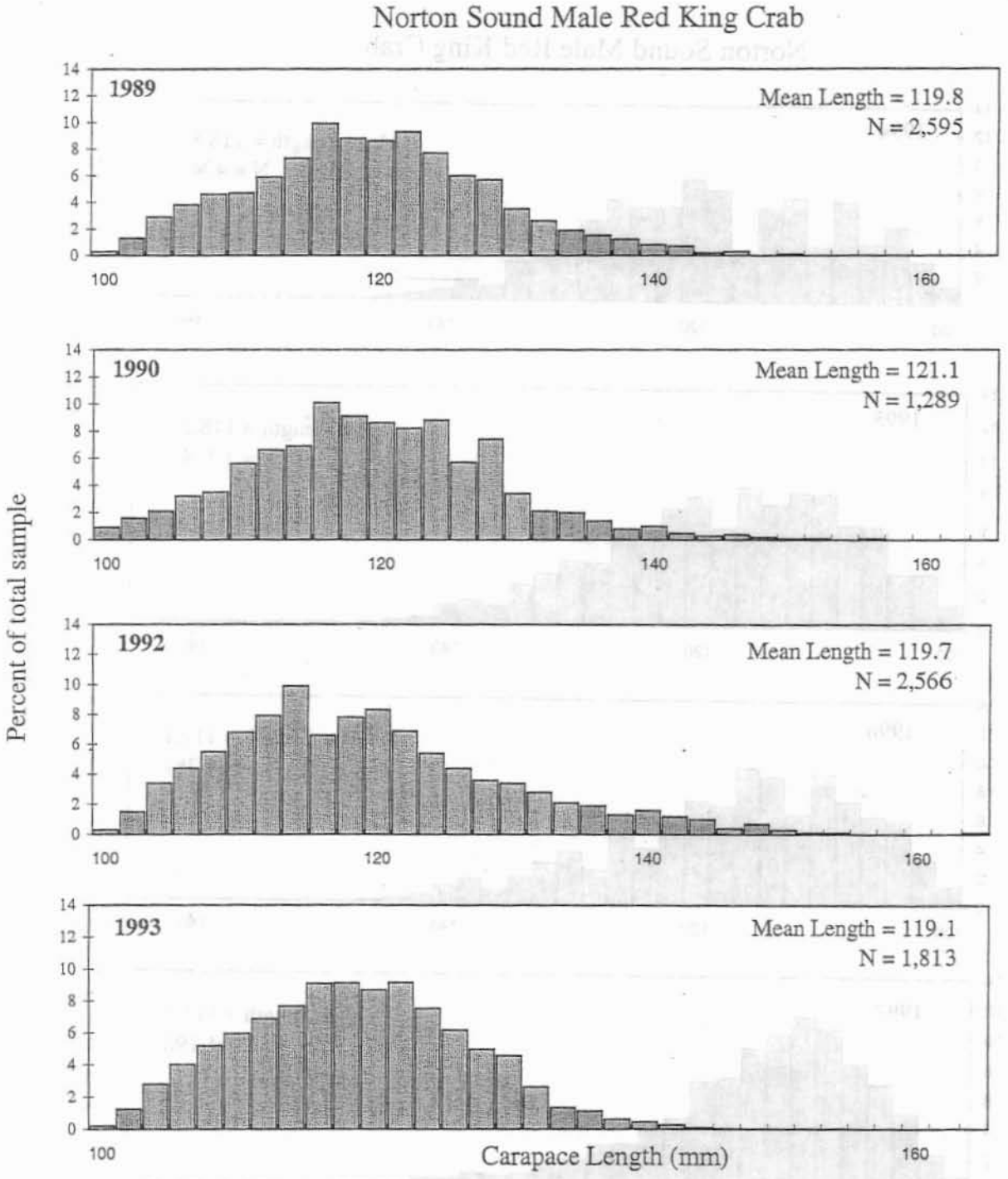

Figure 16. (page 3 of 6)
Note: No fishery in 1991.

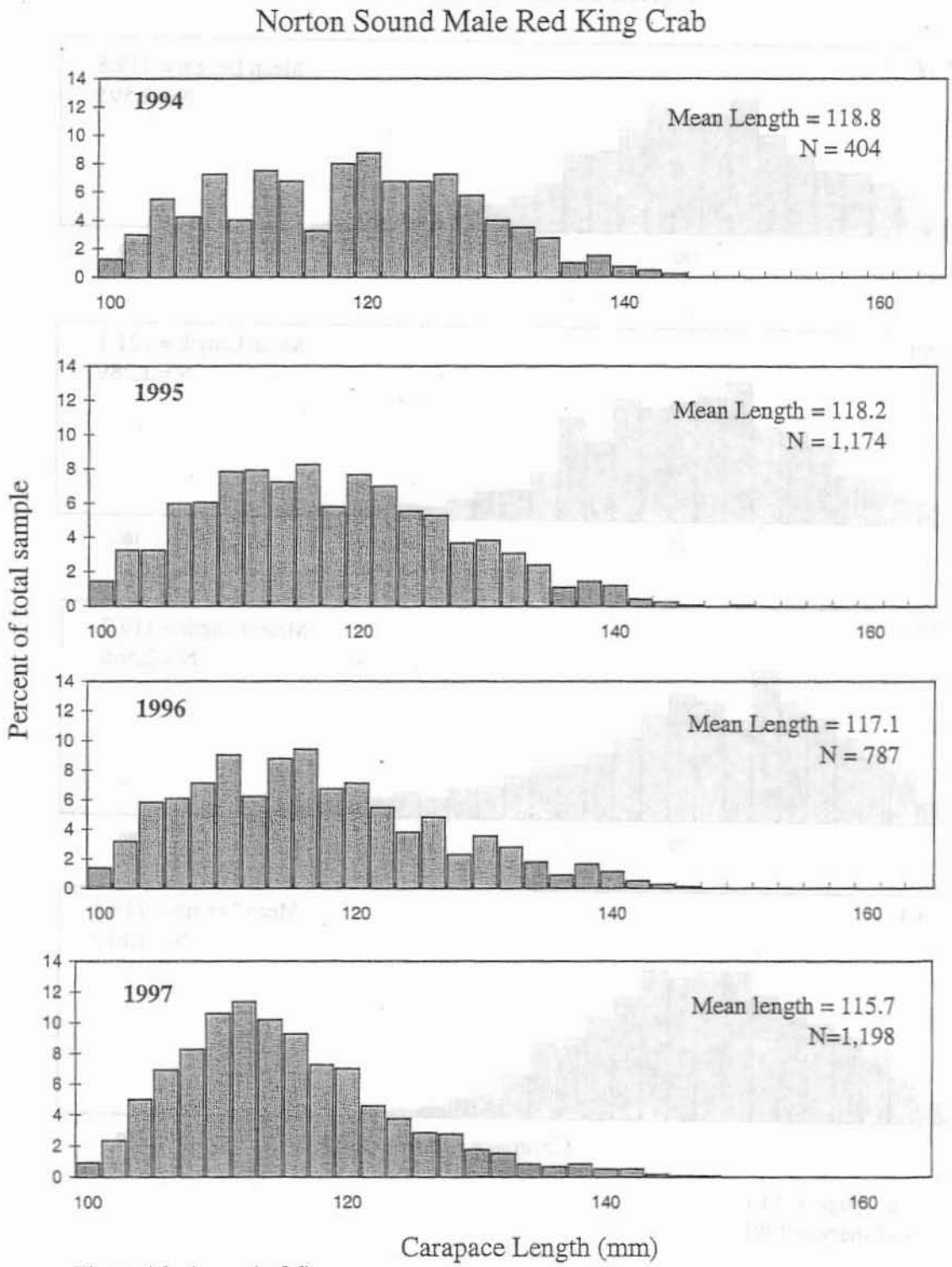

Figure 16. (page 4 of 6)

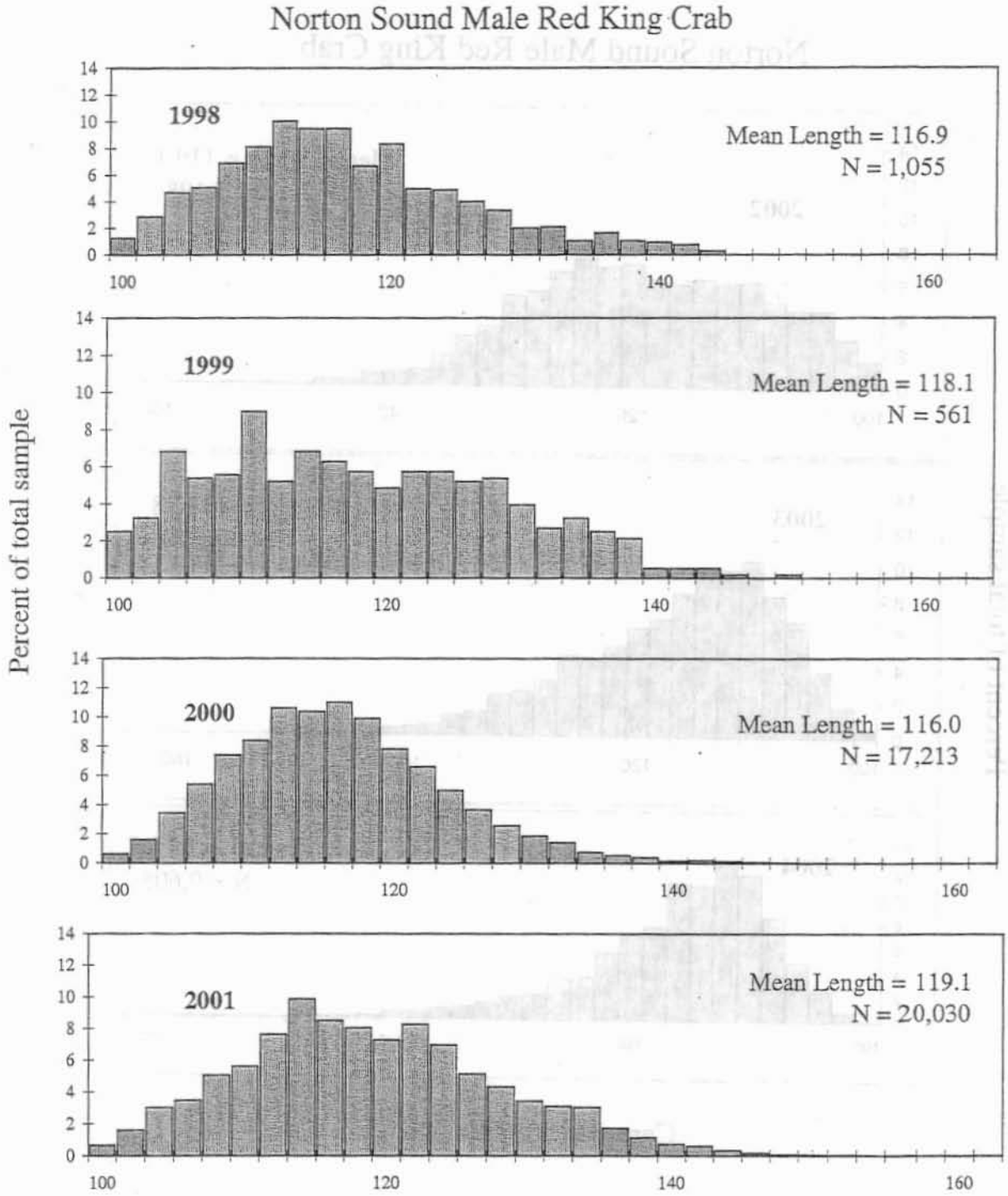

Figure 16. (page 5 of 6)

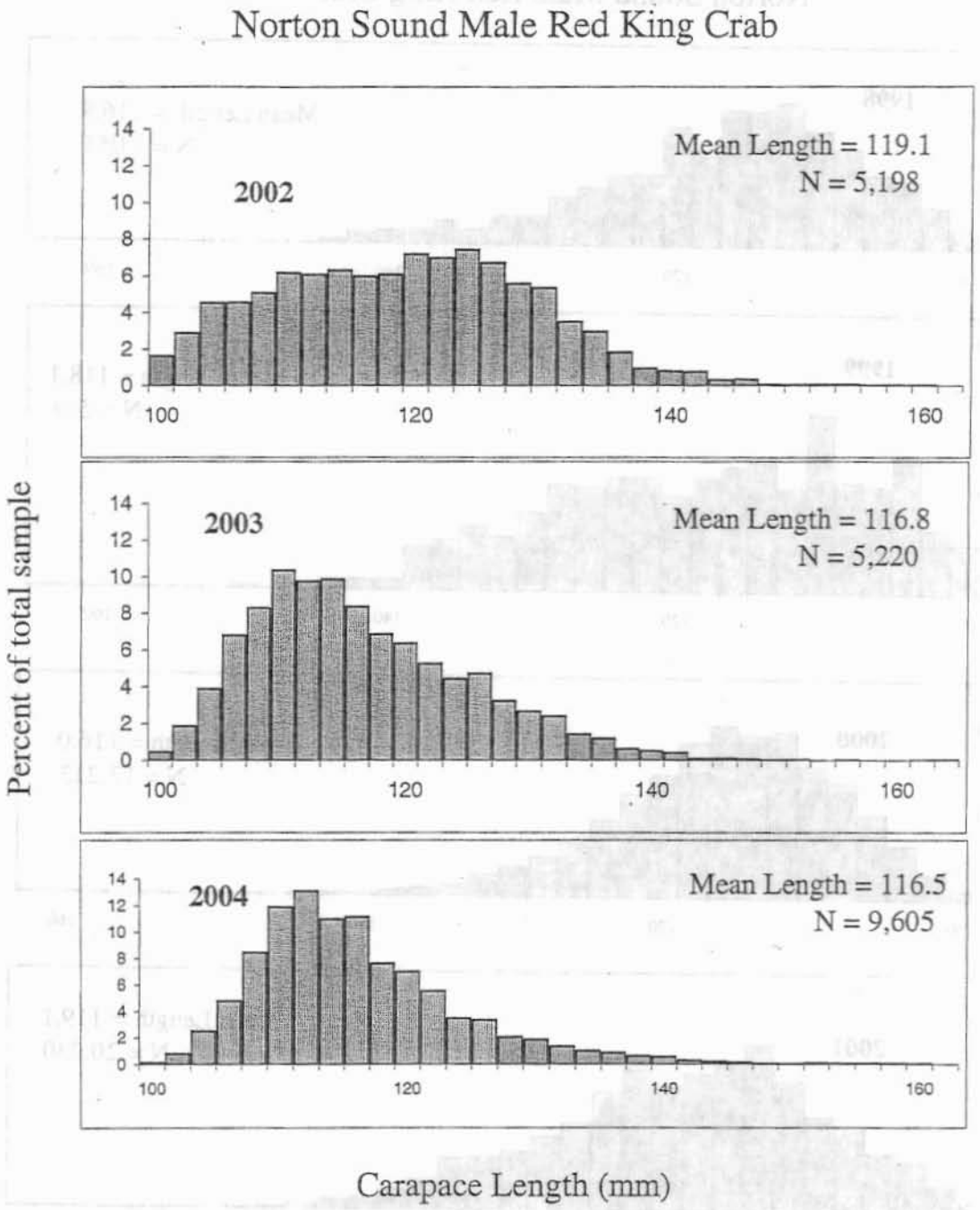

Figure 16. (page 6 of 6)

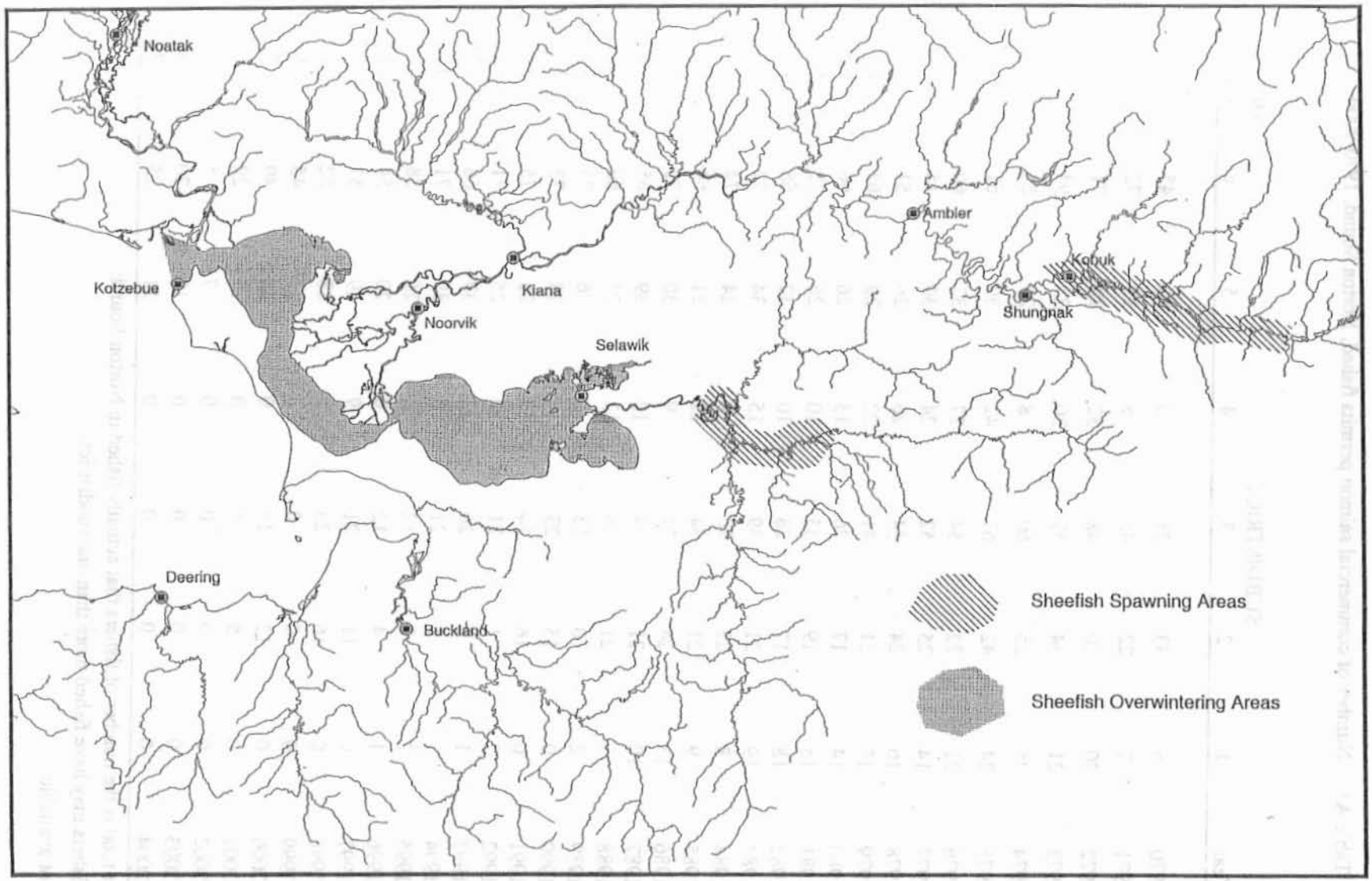

Figure 17. Kotzebue and Kobuk River Valley villages and their spatial relationship with inconnu spawning and overwintering areas.

Appendix Table A1. Number of commercial salmon permits fished, Norton Sound, 1970-2004.

Year	SUBDISTRICT 1	2	3	4	5	6	District [a] 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
2002	0	0	0	0	7	5	12
2003	0	0	0	0	10	20	30
2004	0	0	0	0	11	25	36

[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 salmon catch by species, Norton Sound District, 1961-2004.

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
2002	5	1	1,759	0	600	2,365
2003	12	16	17,058	0	3,560	20,646
2004	0	40	42,016	0	6,296	48,352
Previous 5-Yr Avg [a]	698	15	19,076	33,310	5,858	58,957
Previous 10-Yr Avg [b]	4,262	45	37,550	230,606	15,152	287,614

[a] 1999-2003

[b] 1994-2003

Appendix Table A3. Estimated mean prices paid to commercial salmon fishers, Norton Sound District, 1962-2004.

Year	Chinook	Coho	Pink	Chum
		Price Per Fish		
1962	$3.85	$0.60	$0.25	$0.35
1963	$3.85	$0.60	$0.25	$0.35
1964	$4.50	-	$0.25	$0.40
1965	$3.75	$0.45	-	$0.40
1966	$4.80	$1.05	$0.25	$0.65
		Price Per Pound		
1967	$0.20	$0.14	$0.07	$0.09
1968	$0.25	$0.14	$0.06	$0.10
1969	$0.22	$0.14	$0.06	$0.11
1970	$0.25	$0.14	$0.06	$0.10
1971	$0.25	$0.14	$0.07	$0.10
1972	$0.27	$0.16	$0.06	$0.11
1973	$0.40	$0.16	$0.07	$0.32
1974	$0.40	$0.16	$0.13	$0.32
1975	$0.40	$0.16	$0.13	$0.24
1976	$0.50	$0.32	$0.17	$0.30
1977	$0.65	$0.40	$0.16	$0.30
1978	$0.65	$0.35	$0.20	$0.30
1979	$0.88	$0.66	$0.16	$0.41
1980	$0.74	$0.63	$0.07	$0.23
1981	$1.25	$0.62	$0.13	$0.26
1982	$1.25	$0.57	$0.12	$0.32
1983	$1.13	$0.39	$0.11	$0.28
1984	$1.20	$0.45	$0.11	$0.24
1985	$1.08	$0.48	$0.20	$0.31
1986	$0.88	$0.52	$0.15	$0.27
1987	$1.11	$0.57	$0.20	$0.33
1988	$1.26	$1.13	$0.19	$0.39
1989	$0.73	$0.43	$0.10	$0.18
1990	$1.01	$0.50	$0.75 [a]	$0.23
1991 [b]	$0.87	$0.36	-	$0.27
1992 [c]	$0.66	$0.33	$0.16	$0.22
1993 [d]	$0.72	$0.22	$0.15	$0.24
1994	$1.02	$0.52	$0.15	$0.29
1995	$0.66	$0.43	$0.18	$0.18
1996	$0.54	$0.28	$0.10	$0.08
1997	$1.00	$0.47	$0.06	$0.11
1998	$0.74	$0.29	$0.14	$0.09
1999	$0.82	$0.35	-	$0.11
2000	$1.30	$0.30	$0.10	$0.15
2001 [e]	$1.00	$0.25	-	$0.19
2002	$0.39	$0.20	-	$0.07
2003 [f]	$0.64	$0.44	-	$0.14
2004	-	$0.39	-	$0.14
5 yr. Avg. 1999-2003	$0.83	$0.31		$0.13

[a] Price paid per pound of roe.

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

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

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

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

[f] Price paid for sockeye was $0.45 per pound.

Appendix Table A4. Round weight and value of commercially caught salmon by species, Norton Sound District, 1961 - 2004.

	Pounds Caught (Round Wt. in lbs)					
Year	Chinook	Coho	Pink	Chum	Salmon Roe (lbs)	Value of Catch
1961	120,405	96,649	102,711	347,990		[b]
1962 [a]	157,000	-	10,569	221,645		$105,800.00
1963 [a]	89,700	51,750	-	-		$104,000.00
1964 [a]	39,169	686	-	249,890		$51,000.00
1965	33,327	14,210	660	264,924	[b]	$21,483.00
1966	35,259	40,285	38,334	577,764	16,901	$68,000.00
1967	41,854	15,944	100,913	289,473	21,429	$44,038.00
1968 [c]	22,954	50,665	250,044	306,871	20,381	$63,700.00
1969 [d]	51,441	50,461	312,836	529,235	5,578	$95,297.00
1970	38,103	25,000	156,313	610,588	1,345	$99,019.00
1971	43,112	22,078	15,377	857,014	1,122	$101,000.00
1972	57,675	3,257	133,389	710,853	1,083	$102,225.00
1973	38,935	63,812	185,799	845,596	[b]	$308,740.00
1974	54,433	15,023	511,737	1,082,575	39,876	$437,127.00
1975	25,964	32,345	87,586	1,318,111	46,470	$413,255.00
1976	34,095	49,822	271,867	669,728	[b]	$285,283.00
1977	102,341	28,044	162,457	1,415,981	[b]	$546,010.00
1978	222,974	50,872	1,164,174	1,389,806	[b]	$907,330.00
1979	231,988	251,129	598,785	1,001,548	[b]	$878,792.00
1980	135,646	204,498	719,368	1,301,693	[b]	$572,125.00
1981	164,182	212,065	719,102	1,284,193	[b]	$761,658.00
1982	97,255	648,212	659,171	1,338,788	95	$1,069,723.00
1983	179,666	360,264	274,568	2,352,104	239	$946,232.00
1984	169,104	523,310	343,685	1,020,635	0	$738,064.00
1985	419,331	169,413	11,458	939,885	0	$818,477.00
1986	133,161	247,333	133,319	1,011,824	0	$546,452.00
1987	141,494	177,569	6,691	731,597	0	$517,894.00
1988	67,148	280,658	226,966	767,168	0	$760,641.00
1989	104,829	336,652	439	297,156	0	$319,489.00
1990	168,745	426,902	-	482,060	75	$474,064.00
1991	107,541	469,495	-	597,272	221	$413,479.00
1992	57,571	820,406	18,230	595,345	2,641	$463,616.00
1993	151,504	287,702	406,820	347,072	2,608	$368,723.00
1994	98,492	102,140	2,185,066	122,540	0	$863,060.00
1995	174,771	356,190	198,121	290,445	0	$356,164.00
1996	95,794	573,372	1,196,115	84,349	0	$292,264.00
1997	225,136	235,517	50	253,006	880	$326,618.00
1998	127,831	232,705	1,330,624	106,687	0	$351,410.00
1999	48,421	88,037	0	57,656	0	$82,638.00
2000	11,240	307,565	369,800	40,298	0	$143,621.00
2001	3,803	152,293	0	79,558	0	$56,921.00
2002	50	12,972	0	4,555	0	$2,941.00
2003	136	139,775	0	23,687	0	$64,473.25
2004	0	302,379	0	42,385	0	$122,705.70

[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 A5. Mean commercial salmon harvest weights, Norton Sound District, 1964-2004.

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
2002 [b]	10.0	7.4	-	7.6
2003 [b]	11.3	8.2	-	6.7
2004	-	7.2	-	6.7

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

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

Appendix Table A6. Commercial and subsistence salmon catch by species, by year in Nome Subdistrict, Norton Sound District, 1964-2004. (Page 1 of 2)

NOME (SUBDISTRICT 1)

	Commercial						Subsistence [a]						Combined					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1964	5	-	-	1	1,194	1,200	-	-	-	-	-	-	5	-	-	1	1,194	1,200
1965	1	-	-	183	1,941	2,135	-	-	-	780	1,825	2,605	1	-	-	973	3,766	4,740
1966	1	-	32	1	581	615	12	-	-	1,794	1,762	3,568	13	-	32	1,795	2,343	4,183
1967	-	-	-	72	406	478	11	-	-	349	627	987	11	-	-	421	1,033	1,465
1968	-	-	-	50	102	152	7	-	-	6,507	621	7,135	7	-	-	6,557	723	7,287
1969	-	-	63	330	601	994	2	-	-	3,649	508	4,159	2	-	63	3,979	1,109	5,153
1970	-	-	6	55	960	1,021	-	-	35	5,001	458	5,494	0	-	41	5,056	1,418	6,515
1971	11	-	-	14	2,315	2,340	-	-	122	5,457	2,900	8,479	11	-	122	5,471	5,215	10,819
1972	15	-	-	12	2,643	2,670	19	-	52	4,684	315	5,070	34	-	52	4,696	2,958	7,740
1973	-	-	-	321	1,132	1,453	14	-	120	5,108	1,863	7,105	14	-	120	5,429	2,995	8,558
1974	19	-	123	7,722	10,431	18,295	8	-	5	3,818	183	4,014	27	-	128	11,540	10,614	22,309
1975	2	-	319	2,163	8,364	10,848	2	-	97	6,267	2,858	9,224	4	-	416	8,430	11,222	20,072
1976	2	10	26	1,331	7,620	8,989	13	-	189	5,492	1,705	7,399	15	10	215	6,823	9,325	16,388
1977	8	-	58	65	15,998	16,129	35	-	498	2,773	12,192	15,498	43	-	556	2,838	28,190	31,627
1978	19	-	-	22,869	8,782	31,670	35	-	225	13,063	4,295	17,618	54	-	225	35,932	13,077	49,288
1979	9	-	29	5,860	5,391	11,289	11	-	1,120	6,353	3,273	10,757	20	-	1,149	12,213	8,664	22,046
1980	8	-	-	10,007	13,922	23,937	129	-	2,157	22,246	5,983	30,515	137	-	2,157	32,253	19,905	54,452
1981	4	-	508	3,202	18,666	22,380	35	14	1,726	5,584	8,579	15,938	39	14	2,234	8,786	27,245	38,318
1982	20	-	1,183	18,512	13,447	33,162	21	6	1,829	19,202	4,831	25,889	41	6	3,012	37,714	18,278	59,051
1983	23	-	261	308	11,691	12,283	74	53	1,911	8,086	7,091	17,215	97	53	2,172	8,394	18,782	29,498
1984	7	-	820	-	3,744	4,571	83	16	1,795	17,182	4,883	23,959	90	16	2,615	17,182	8,627	28,530
1985	21	-	356	-	6,219	6,596	56	114	1,054	2,117	5,667	9,008	77	114	1,410	2,117	11,886	15,604

-Continued-

Appendix Table A6. Commercial and subsistence salmon catch by species, by year in Nome Subdistrict, Norton Sound District, 1964-2004.

NOME (SUBDISTRICT 1)

	Commercial						Subsistence [a]						Combined					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1986	6	-	50	-	8,160	8,216	150	107	688	8,720	8,085	17,750	156	107	738	8,720	16,245	25,966
1987	3	-	577	-	5,646	6,226	200	107	1,100	1,251	8,394	11,052	203	107	1,677	1,251	14,040	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
2002	0	0	0	0	0	0	4	79	666	3,161	1114	5,024	4	79	666	3,161	1,114	5,024
2003	0	0	0	0	0	0	63	76	351	507	565	1,562	63	76	351	507	565	1,562
2004[b]	0	0	0	0	0	0	100	106	1,574	15,047	685	17,512	100	106	1,574	15,047	685	17,512
5-year avg.[c]	0	0	0	0	0	0	19	68	547	1,610	768	3,012	19	68	547	1,610	768	3,012
10-year avg.[d]	0	0	67	1	19	87	20	110	814	2,442	2,072	5,459	20	111	880	2,444	2,091	5,546

[a] Subsistence harvest are incomplete prior to 1979.

[b] Preliminary

[c] 1999-2003

[d] 1994-2003

Appendix Table A7. Commercial and subsistence salmon catch by species, by year in Golovin Subdistrict, Norton Sound District, 1962-2004.

GOLOVIN (SUBDISTRICT 2)

	Commercial						Subsistence						Combined					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1962	45	11	264	10,276	68,720	79,316	-	-	-	-	-	-	45	11	264	10,276	68,720	79,316
1963	40	40	-	19,677	49,850	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	16,721	20,566	39,303	4	-	353	2,046	2,614	5,017	17	-	356	20,767	23,180	44,320
1971	37	-	197	2,735	33,824	36,793	7	-	191	1,544	1,936	3,678	44	-	388	4,279	35,760	40,471
1972	36	-	20	6,562	27,097	33,715	4	-	62	1,735	2,028	3,829	40	-	82	8,297	29,125	37,544
1973	70	-	183	14,145	41,689	56,087	1	-	48	9	74	132	71	-	231	14,154	41,763	56,219
1974	30	-	3	28,340	30,173	58,546	3	-	-	967	205	1,175	33	-	3	29,307	30,378	59,721
1975	17	-	206	10,770	41,761	52,754	-	-	1	2,011	2,025	4,037	17	-	207	12,781	43,786	56,791
1976	12	-	1,311	24,051	30,219	55,593	-	-	-	1,995	1,128	3,123	12	-	1,311	26,046	31,347	58,716
1977	26	-	426	7,928	53,912	62,292	3	-	80	703	2,915	3,701	29	-	506	8,631	56,827	65,993
1978	22	-	94	72,033	41,462	113,611	1	-	-	2,470	1,061	3,532	23	-	94	74,503	42,523	117,143
1979	75	49	1,606	45,948	30,201	77,879	-	-	845	2,546	2,840	6,231	75	49	2,451	48,494	33,041	84,110
1980	36	36	328	10,774	52,609	63,783	12	-	692	10,727	4,057	15,488	48	36	1,020	21,501	56,666	79,271
1981	23	5	13	49,755	58,323	108,119	8	-	1,520	5,158	5,543	12,229	31	5	1,533	54,913	63,866	120,348
1982	78	5	4,281	39,510	51,970	95,844	7	-	1,289	4,752	1,868	7,916	85	5	5,570	44,262	53,838	103,760
1983	52	10	295	17,414	48,283	66,054	-	-	-	-	-	-[e]	-	-	-	-	-	-
1984	31	-	2,462	88,588	54,153	145,234	-	-	-	-	-	-[e]	-	-	-	-	-	-
1985	193	113	1,196	3,019	55,781	60,302	12	2	430	1,904	9,577	11,925[e]	205	115	1,626	4,923	65,358	72,227

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Appendix Table A7. Commercial and subsistence salmon catch by species, by year in Golovin Subdistrict, Norton Sound District, 1962-2004.

GOLOVIN (SUBDISTRICT 2)

	Commercial						Subsistence						Combined					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
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 [d]	169	18	3,980	28,314	1,319	33,800
2001	0	43	30	0	7,094	7,167	89	72	880	1,665	3,291	5,997 [d]	89	115	910	1,665	10,385	13,164
2002	0	0	0	0	0	0	69	66	1,640	14,430	1,882	18,087 [d]	69	66	1,640	14,430	1,882	18,087
2003	0	0	0	0	0	0	166	28	309	5,012	1,477	6,992 [d]	166	28	309	5,012	1,477	6,992
2,004	0	0	0	0	0	0	164	6	652	19,866	874	21,562 [e]	164	6	652	19,866	874	21,562
5-year avg. [a]	0	9	335	3,482	1,452	5,277	111	46	1,280	6,496	2,292	10,225	111	55	1,615	9,978	3,744	15,502
10-year avg. [b]	2	5	746	12,849	1,808	15,409	138	103	1,364	8,402	3,282	13,289	140	108	2,110	21,250	5,090	28,698

[a] 1999-2003

[b] 1994-2003

[c] Subsistence survey not conducted.

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

[e] Preliminary. This was the first year a permit was required for Golovin Subdistrict.

Appendix Table A8. Commercial and subsistence salmon catch by species, by year in Moses Point Subdistrict, Norton Sound District, 1962-2004.

MOSES POINT (SUBDISTRICT 3)

	Commercial						Subsistence						Combined					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1962	27	-	-	11,100	50,683	61,810	-	-	-	-	-	-	27	-	-	11,100	50,683	61,810
1963	15	-	-	2,549	46,274	48,838	5	-	-	5,808	8,316	14,129	20	-	-	8,357	54,590	62,967
1964	32	3	-	3,372	28,568	31,975	-	-	-	63	348	411	32	3	0	3,435	28,916	32,386
1965	-	-	-	-	-	-	16	-	72	1,325	9,857	11,270	16	-	72	1,325	9,857	11,270
1966	17	-	-	2,745	24,741	27,503	14	-	250	2,511	5,409	8,184	31	0	250	5,256	30,150	35,687
1967	-	-	-	-	-	-	39	-	116	1,322	9,913	11,390	39	-	116	1,322	9,913	11,390
1968	12	-	1	9,012	17,908	26,933	2	-	80	6,135	2,527	8,744	14	-	81	15,147	20,435	35,677
1969	29	-	-	11,807	26,594	38,430	9	-	109	1,790	1,303	3,211	38	-	109	13,597	27,897	41,641
1970	39	-	-	13,052	29,726	42,817	16	-	160	4,661	6,960	11,797	55	-	160	17,713	36,686	54,614
1971	95	-	4	922	43,831	44,852	16	-	271	1,046	2,227	3,560	111	-	275	1,968	46,058	48,412
1972	190	-	11	5,866	30,919	36,986	44	-	108	1,579	2,070	3,801	234	-	119	7,445	32,989	40,787
1973	134	-	-	10,603	31,389	42,126	2	-	-		298	300	136	-	-	10,603	31,687	42,426
1974	198	-	9	12,821	55,276	68,304	3	-	-	2,382	1,723	4,108	201	-	9	15,203	56,999	72,412
1975	16	-	-	4,407	46,699	51,122	2	-	6	1,280	508	1,796	18	-	6	5,687	47,207	52,918
1976	24	-	232	5,072	10,890	16,218	22	-	-	5,016	1,548	6,586	46	-	232	10,088	12,438	22,804
1977	96	-	6	9,443	47,455	57,000	22	-	225	1,145	1,170	2,562	118	-	231	10,588	48,625	59,562
1978	444	-	244	39,694	44,595	84,977	38	-	407	1,995	1,229	3,669	482	-	651	41,689	45,824	88,646
1979	1,035	-	177	40,811	37,123	79,146	16	-	890	6,078	1,195	8,179	1,051	-	1,067	46,889	38,318	87,325
1980	502	-	-	1,435	14,755	16,692	131	-	229	4,232	1,393	5,985	633	-	229	5,667	16,148	22,677
1981	198	-	5	26,417	29,325	55,945	32	-	2,345	6,530	2,819	11,726	230	-	2,350	32,947	32,144	67,671
1982	253	-	318	9,849	40,030	50,450	1	-	1,835	3,785	3,537	9,158	254	-	2,153	13,634	43,567	59,608
1983	254	-	-	17,027	65,776	83,057	-	-	-	-	-	-°	-	-	-	-	-	-
1984	-	-	5,959	28,035	9,477	43,471	-	-	-	-	-	-°	-	-	-	-	-	-
1985	816	32	1,803	559	24,466	27,676	67	-	1,389	1,212	947	3,615°	883	32	3,192	1,771	25,413	31,291

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Appendix Table A8. Commercial and subsistence salmon catch by species, by year in Moses Point Subdistrict, Norton Sound District, 1962-2004.

MOSES POINT (SUBDISTRICT 3)

	Commercial						Subsistence						Combined					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
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
2002	0	0	0	0	0	0	565	14	1,801	8,345	1,451	12,176 [d]	565	14	1,801	8,345	1,451	12,176
2003	0	0	0	0	0	0	660	39	1,143	2,524	1,687	6,053 [d]	660	39	1,143	2,524	1,687	6,053
2004	0	0	0	0	0	0	411	0	694	7,858	683	9,646 [e]	411	0	694	7,858	683	9,646
5-year avg. [a]	3	0	1,376	9,274	243	10,896	465	36	1,340	3,961	1,191	6,993	468	36	2,716	13,235	1,434	17,889
10-year avg. [b]	97	4	2,075	26,361	780	29,317	438	45	1,400	4,884	1,896	8,664	535	50	3,475	31,245	2,676	37,981

[a] 1999-2003

[b] 1994-2003

[c] Subsistence survey not conducted.

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

[e] Preliminary. This was the first year a permit was required for Moses Point Subdistrict.

Appendix Table A9. Commercial and subsistence salmon catch by species, by year in Norton Bay Subdistrict, Norton Sound District, 1962-2004.

NORTON BAY (SUBDISTRICT 4)

	Commercial						Subsistence						Combined					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1962	387	7	40	4,402	24,380	29,216	-	-	-	-	-	-	387	7	40	4,402	24,380	29,216
1963	137	2	-	17,676	12,469	30,284	-	-	-	5,097	-	5,097	137	2	-	22,773	12,469	35,381
1964	50	3	-	988	5,916	6,957	-	-	-	-	-	-	50	3	-	988	5,916	6,957
1965	-	-	-	-	-	-	4	-	22	252	3,032	3,310	4	-	22	252	3,032	3,310
1966	-	-	-	-	-	-	7	-	41	929	3,612	4,589	7	-	41	929	3,612	4,589
1967	-	-	-	-	-	-	12	-	14	1,097	2,945	4,068	12	-	14	1,097	2,945	4,068
1968	-	-	-	-	-	-	28	-	71	1,916	1,872	3,887	28	-	71	1,916	1,872	3,887
1969	26	-	-	4,849	3,974	8,849	59	-	189	2,115	3,855	6,218	85	-	189	6,964	7,829	15,067
1970	-	-	-	-		-	3	-	10	840	3,500	4,353	3	-	10	840	3,500	4,353
1971	-	-	-	-	-	-	5	-	47	92	2,619	2,763	5	-	47	92	2,619	2,763
1972	43	-	-	1,713	7,799	9,555	30	-	44	2,089	2,022	4,185	73	-	44	3,802	9,821	13,740
1973	28	-	-	1,645	4,672	6,345	1	-	-	10	130	141	29	-	-	1,655	4,802	6,486
1974	21	-	-	654	3,826	4,501	-	-	-	17	900	917	21	-	-	671	4,726	5,418
1975	68	-	89	1,137	17,385	18,679	1	-	-	93	361	455	69	-	89	1,230	17,746	19,134
1976	102	-	95	4,456	7,161	11,814	2	-	-	41	236	279	104	-	95	4,497	7,397	12,093
1977	158	-	1	2,495	13,563	16,217	14	-	-	420	2,055	2,489	172	-	1	2,915	15,618	18,706
1978	470	-	144	8,471	21,973	31,058	12	-	21	1,210	1,060	2,303	482	-	165	9,681	23,033	33,361
1979	856	-	2,547	6,201	15,599	25,203	12	-	697	735	1,400	2,844	868	-	3,244	6,936	16,999	28,047
1980	340	-	-	47	7,855	8,242	22	-	33	4,275	1,132	5,462	362	-	33	4,322	8,987	13,704
1981	63	-	-	177	3,111	3,351	7	-	82	2,314	3,515	5,918	70	-	82	2,491	6,626	9,269
1982	96	-	2,332	2,535	7,128	12,091	1	-	484	2,600	2,485	5,570	97	-	2,816	5,135	9,613	17,661
1983	215	-	204	3,935	17,157	21,511	-	-	-	-	-	- [a]	-	-	-	-	-	-
1984	-	-	-	1,162	3,442	4,604	-	-	-	-	-	- [a]	-	-	-	-	-	-
1985	528	-	384	68	9,948	10,928	-	-	-	-	-	- [a]	-	-	-	-	-	-

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Appendix Table A9. Commercial and subsistence salmon catch by species, by year in Norton Bay Subdistrict, Norton Sound District, 1962-2004.

NORTON BAY (SUBDISTRICT 4)

	Commercial						Subsistence						Combined					
Year	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	6,867 [e]	850	54	322	1,795	4,571	7,592
1998 [d]	0	0	0	0	0	0	684	0	388	2,009	6,192	9,273 [e]	684	0	388	2,009	6,192	9,273
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	10,398 [e]	460	14	276	5,203	4,445	10,398
2002 [d]	0	0	0	0	0	0	557	0	509	6,049	3,971	11,086 [e]	557	0	509	6,049	3,971	11,086
2003 [d]	0	0	0	0	0	0	373	46	510	4,184	3,397	8,510 [e]	373	46	510	4,184	3,397	8,510
2004 [d]	0	0	0	0	0	0						[e]						
5-year avg. [a]	0	0	0	0	0	0	423	12	346	3,927	4,136	8,844	423	12	346	3,927	4,136	8,844
10-year avg. [b]	19	0	0	0	53	73	453	17	447	3,693	4,548	9,158	473	17	447	3,693	4,601	9,231

[a] 1999-2003

[b] 1994-2003

[c] Subsistence survey not conducted.

[d] No commercial harvest reported.

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

Appendix Table A10. Commercial and subsistence salmon catch by species, by year in Shaktoolik Subdistrict, Norton Sound District, 1961-2004.

SHAKTOOLIK (SUBDISTRICT 5)

	Commercial						Subsistence						Combined					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1961	140	-	-	29,075	24,746	53,961	-	-	-	-	-	-	140	-	-	29,075	24,746	53,961
1962	1,738	-	2,113	640	8,718	13,209	-	-	-	-	-	-	1,738	-	2,113	640	8,718	13,209
1963	480	11	563	5,138	19,153	25,345	-	-	-	-	-	-	480	11	563	5,138	19,153	25,345
1964	631	79	16	1,969	35,272	37,967	77	-	340	2,132	5,412	7,961	708	79	356	4,101	40,684	45,928
1965	127	30	-	3	8,356	8,516	31	-	107	3,763	3,420	7,321	158	30	107	3,766	11,776	15,837
1966	310	-	956	344	8,292	9,902	142	-	762	1,445	4,183	6,532	452	-	1,718	1,789	12,475	16,434
1967	43	-	88	1,050	1,655	2,836	262	-	387	2,010	4,436	7,095	305	-	475	3,060	6,091	9,931
1968	61	-	130	2,205	2,504	4,900	10	-	458	6,355	1,915	8,738	71	-	588	8,560	4,419	13,638
1969	33	-	276	6,197	8,645	15,151	40	-	193	4,018	3,439	7,690	73	-	469	10,215	12,084	22,841
1970	197	-	155	2,301	15,753	18,406	43	-	210	2,474	2,016	4,743	240	-	365	4,775	17,769	23,149
1971	284	-	238	28	13,399	13,949	87	-	329	494	5,060	5,970	371	-	567	522	18,459	19,919
1972	419	-	11	2,798	12,022	15,250	64	-	235	939	3,399	4,637	483	-	246	3,737	15,421	19,887
1973	289	-	177	6,450	14,500	21,416	51	-	130	3,410	1,397	4,988	340	-	307	9,860	15,897	26,404
1974	583	-	179	5,650	26,391	32,803	93	-	353	1,901	358	2,705	676	-	532	7,551	26,749	35,508
1975	651	2	812	1,774	49,536	52,775	18	-	14	1,394	334	1,760	669	2	826	3,168	49,870	54,535
1976	892	-	129	15,803	15,798	32,622	24	-	121	1,188	269	1,602	916	-	250	16,991	16,067	34,224
1977	1,521	4	418	7,743	36,591	46,277	49	-	170	585	2,190	2,994	1,570	4	588	8,328	38,781	49,271
1978	1,339	7	1,116	46,236	35,388	84,086	81	-	15	3,275	1,170	4,541	1,420	7	1,131	49,511	36,558	88,627
1979	2,377	-	3,383	18,944	22,030	46,734	62	-	1,605	2,575	1,670	5,912	2,439	-	4,988	21,519	23,700	52,646
1980	1,086	-	8,001	1,947	27,453	38,487	57	-	756	3,227	1,827	5,867	1,143	-	8,757	5,174	29,280	44,354
1981	1,484	4	1,191	29,695	21,097	53,471	8	-	525	2,225	3,490	6,248	1,492	4	1,716	31,920	24,587	59,719
1982	1,677	3	22,233	17,019	26,240	67,172	68	-	2,138	3,865	1,165	7,236	1,745	3	24,371	20,884	27,405	74,408
1983	2,742	4	12,877	12,031	67,310	94,964	-	-	-	-	-	-	- [e]	-	-	-	-	-
1984	1,613	-	10,730	1,596	32,309	46,248	-	-	-	-	-	-	- [e]	-	-	-	-	-
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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Appendix Table A10. Commercial and subsistence salmon catch by species, by year in Shaktoolik Subdistrict, Norton Sound District, 1961-2004.

SHAKTOOLIK (SUBDISTRICT 5)

	Commercial						Subsistence						Combined					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1986	1,075	29	6,626	-	16,126	23,856	-	-	-	-	-	-	- [c]	-	-	-	-	-
1987	2,214	-	6,193	-	14,088	22,495	-	-	-	-	-	-	- [c]	-	-	-	-	-
1988	671	79	6,096	3,681	21,521	32,048	-	-	-	-	-	-	- [c]	-	-	-	-	-
1989	1,241	43	8,066	0	19,641	28,991	-	-	-	-	-	-	- [c]	-	-	-	-	-
1990	2,644	49	4,695	0	21,748	29,136	-	-	-	-	-	-	- [c]	-	-	-	-	-
1991	1,324	55	11,614	0	31,619	44,612	-	-	-	-	-	-	- [c]	-	-	-	-	-
1992	1,098	56	14,660	0	27,867	43,681	-	-	-	-	-	-	- [c]	-	-	-	-	-
1993	2,756	20	11,130	106,743	20,864	141,513	-	-	-	-	-	-	- [c]	-	-	-	-	-
1994	885	8	22,065	502,231	5,411	530,600	1,175	1	2,777	9,133	1,221	14,307 [d]	2,060	9	24,842	511,364	6,632	544,907
1995	1,239	5	10,856	37,377	14,775	64,252	1,275	2,480	2,626	7,024	2,480	15,885 [d]	2,514	2,485	13,482	44,401	17,255	80,137
1996	1,340	1	13,444	304,982	3,237	323,004	1,114	31	3,615	8,370	4,425	17,555 [d]	2,454	32	17,059	313,352	7,662	340,559
1997	2,449	0	4,694	-	5,747	12,890	1,146	62	2,761	5,779	1,612	11,360 [d]	3,595	62	7,455	5,779	7,359	24,250
1998	910	0	3,624	236,171	7,080	247,785	982	92	1,872	6,270	1,034	10,250 [d]	1,892	92	5,496	242,441	8,114	258,035
1999	581	0	2,398	0	2,181	5,160	818	183	1,556	5,092	467	8,116 [d]	1,399	183	3,954	5,092	2,648	13,276
2000	160	3	7,779	85,493	2,751	96,186	440	20	2,799	5,432	2,412	11,103 [d]	600	23	10,578	90,925	5,163	107,289
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
2002	1	0	680	0	261	942	1,230	4	2,169	8,769	800	12,972 [d]	1,231	4	2,849	8,769	1,061	13,914
2003	2	0	4,031	0	485	4,518	881	50	2,941	12,332	587	16,791 [d]	883	50	6,972	12,332	1,072	21,309
2004	0	0	12,734	0	1,372	14,106	786	10	1,663	6,076	219	8,754 [e]	786	10	14,397	6,076	1,591	22,860
5-year avg. [a]	167	1	3,510	17,099	1,499	22,276	861	80	2,311	8,359	1,164	12,775	1,028	81	5,821	25,458	2,663	35,051
10-year avg. [b]	766	2	7,224	116,625	4,375	128,991	1,000	307	2,521	7,837	1,659	13,323	1,765	308	9,744	124,463	6,034	142,314

[a] 1999-2003

[b] 1994-2003

[c] Subsistence survey not conducted.

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

[e] Preliminary reported, unexpanded survey results.

Appendix Table A11 Commercial and subsistence salmon catch by species, by year in Unalakleet Subdistrict, Norton Sound District, 1961-2004.

UNALAKLEET (SUBDISTRICT 6)

	Commercial						Subsistence						Combined					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1961	5,160	35	13,807	5,162	23,586	47,750	-	-	-	-	-	-	5,160	35	13,807	5,162	23,586	47,750
1962	5,089	-	6,739	6,769	30,283	48,880	-	-	-	-	-	-	5,089	-	6,739	6,769	30,283	48,880
1963	5,941	18	16,202	1,140	27,003	50,304	-	-	-	-	-	-	5,941	18	16,202	1,140	27,003	50,304
1964	1,273	1	79	1	19,611	20,965	488	-	2,227	7,030	6,726	16,471	1,761	1	2,306	7,031	26,337	37,436
1965	1,321	-	2,030	24	26,498	29,873	521	-	4,562	11,488	8,791	25,362 [c]	1,842	-	6,592	11,512	35,289	55,235
1966	1,208	-	4,183	5,023	16,840	27,254	90	-	789	6,083	3,387	10,349 [c]	1,298	-	4,972	11,106	20,227	37,603
1967	1,751	-	1,544	21,961	8,502	33,758	490	-	484	9,964	-	10,938 [c]	2,241	-	2,028	31,925	8,502	44,696
1968	960	-	6,549	41,474	14,865	63,848	186	-	1,493	11,044	2,982	15,705 [c]	1,146	-	8,042	52,518	17,847	79,553
1969	2,276	-	5,273	40,558	22,032	70,139	324	-	1,483	4,230	4,196	10,233 [c]	2,600	-	6,756	44,788	26,228	80,372
1970	1,604	-	4,261	30,779	40,029	76,673	495	-	3,907	10,104	7,214	21,720 [c]	2,099	-	8,168	40,883	47,243	98,393
1971	2,166	-	2,688	1,196	37,543	43,593	911	-	3,137	2,230	7,073	13,351 [c]	3,077	-	5,825	3,426	44,616	56,944
1972	2,235	-	412	28,231	20,440	51,318	643	-	1,818	3,132	4,132	9,725 [c]	2,878	-	2,230	31,363	24,572	61,043
1973	1,397	-	8,922	13,335	25,716	49,370	323	-	213	6,233	3,426	10,195	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	136,200	37,079	186,546	1,044	-	2,538	13,268	3,442	20,292	8,569	5	8,275	149,468	40,521	206,838
1979	6,354	8	23,696	49,647	30,445	110,150	640	-	3,330	6,960	1,597	12,527	6,994	8	27,026	56,607	32,042	122,677
1980	4,339	3	21,512	203,142	64,198	293,194	1,046	-	4,758	19,071	5,230	30,105	5,385	3	26,270	222,213	69,428	323,299
1981	6,157	47	29,845	123,233	39,186	198,468	869	24	5,808	5,750	4,235	16,686	7,026	71	35,653	128,983	43,421	215,154
1982	3,768	2	61,343	142,856	44,520	252,489	913	2	7,037	20,045	4,694	32,691	4,681	4	68,380	162,901	49,214	285,180
1983	7,022	13	36,098	26,198	109,220	178,551	1,868	33	6,888	13,808	4,401	26,998	8,890	46	42,986	40,006	113,621	205,549
1984	6,804	6	47,904	-	43,317	98,031	1,650	1	6,675	17,418	3,348	29,092	8,454	7	54,579	17,418	46,665	127,123
1985	12,621	21	15,421	1	25,111	53,175	1,397	3	2,244	55	1,968	5,667	14,018	24	17,665	56	27,079	58,842

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Appendix Table A11 Commercial and subsistence salmon catch by species, by year in Unalakleet Subdistrict, Norton Sound District, 1961-2004.

UNALAKLEET (SUBDISTRICT 6)

	Commercial						Subsistence						Combined					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1986	4,494	153	20,580	-	30,239	55,466	-	-	-	-	0	- [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	87,100	511,730	25,020	634,434
1995	7,617	78	31,280	37,009	24,843	100,827	5,049	807	13,110	17,246	13,460	49,672 [f]	12,666	885	44,390	54,255	38,303	150,499
1996	3,644	-	52,200	113,837	7,369	177,050	5,324	608	15,963	19,782	16,481	58,158 [f]	8,968	608	68,163	133,619	23,850	235,208
1997	9,067	159	26,079	-	17,139	52,444	6,325	353	9,120	10,804	7,649	34,251 [f]	15,392	512	35,199	10,804	24,788	86,695
1998	6,413	7	24,534	99,412	6,210	136,576	5,915	639	11,825	17,259	7,962	43,600 [f]	12,328	646	36,359	116,671	14,172	180,176
1999	1,927	0	10,264	0	5,700	17,891	4,504	848	10,250	10,791	10,040	36,433 [f]	6,431	848	20,514	10,791	15,740	54,324
2000	582	11	29,803	17,278	2,700	50,374	2887	569	9,487	11,075	7,294	31,312 [f]	3,469	580	39,290	28,353	9,994	81,686
2001	116	1	15,102	0	1,512	16,731	3662	376	9,520	11,710	9,163	34,431 [f]	3,778	377	24,622	11,710	10,675	51,162
2002	4	1	1,079	0	339	1,423	3044	600	8,301	23,599	8,599	44,143 [f]	3,048	601	9,380	23,599	8,938	45,566
2003	10	0	13,027	0	3,075	16,112	2,585	283	6,192	21,777	1,785	32,622 [f]	2,595	283	19,219	21,777	4,860	48,734
2004	0	40	29,282	0	4,924	34,246	2,255	276	5,307	17,969	1,174	26,981 [g]	2,255	316	34,589	17,969	6,098	61,227
5-year avg. [a]	528	3	13,855	3,456	2,665	20,506	3,336	535	8,750	15,790	7,376	35,788	3,864	538	22,605	19,246	10,041	56,294
10-year avg. [b]	3,378	33	27,439	74,769	8,118	113,736	4,459	590	10,985	17,562	9,517	43,112	7,837	623	38,424	92,331	17,634	156,848

[a] 1999-2003

[b] 1994-2003

[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.

[g] Preliminary reported, unexpanded survey results.

Appendix Table A12. Commercial, subsistence, and sport salmon catch by species, by year for all subdistricts in Norton Sound District, 1961-2004.

ALL SUBDISTRICTS

	Commercial						Subsistence						Sport					
Year	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	-	-	-	-	-	-	-	-	-	-	-	-
1962	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	-	-	-	-	-	-
1964	2,018	126	98	13,567	148,862	164,671	565	-	2,567	9,225	12,486	24,843	-	-	-	-	-	-
1965	1,449	30	2,030	220	36,795	40,524	574	-	4,812	19,131	30,772	55,289	-	-	-	-	-	-
1966	1,553	14	5,755	12,778	80,245	100,345	269	-	2,210	14,335	21,873	38,687	-	-	-	-	-	-
1967	1,804	-	2,379	28,879	41,756	74,818	817	-	1,222	17,516	22,724	42,279	-	-	-	-	-	-
1968	1,045	-	6,885	71,179	45,300	124,409	237	-	2,391	36,912	11,661	51,201	-	-	-	-	-	-
1969	2,392	-	6,836	86,949	82,795	178,972	436	-	2,191	18,562	15,615	36,804	-	-	-	-	-	-
1970	1,853	-	4,423	64,908	107,034	178,218	561	-	4,675	26,127	22,763	54,126	-	-	-	-	-	-
1971	2,593	-	3,127	4,895	131,362	141,977	1,026	197	4,097	10,863	21,618	37,801	-	-	-	-	-	-
1972	2,938	-	454	45,182	100,920	149,494	804	93	2,319	14,158	13,873	31,247	-	-	-	-	-	-
1973	1,918	-	9,282	46,499	119,098	176,797	392	-	520	14,770	7,185	22,867	-	-	-	-	-	-
1974	2,951	-	2,092	148,519	162,267	315,829	420	-	1,064	16,426	3,958	21,868	-	-	-	-	-	-
1975	2,393	2	4,593	32,388	212,485	251,861	186	11	192	15,803	8,113	24,305	-	-	-	-	-	-
1976	2,243	11	6,934	87,919	95,956	193,063	203	-	1,004	18,048	7,718	26,973	-	-	-	-	-	-
1977	4,500	5	3,690	48,675	200,455	257,325	846	-	2,530	14,296	26,607	44,279	197	0	449	2,402	670	3,718
1978	9,819	12	7,335	325,503	189,279	531,948	1,211	-	2,981	35,281	12,257	51,730	303	0	742	7,399	546	8,990
1979	10,706	57	31,438	167,411	140,789	350,401	747	-	8,487	25,247	11,975	46,456	-	-	-	-	-	-
1980	6,311	40	29,842	227,352	180,792	444,337	1,397	-	8,625	69,778	19,622	93,422	52	0	1,455	7,732	1,601	10,840
1981	7,929	56	31,562	232,479	169,708	441,734	2,021	38	13,416	28,741	32,866	77,082 [c]	70	0	1,504	3,101	1,889	6,564
1982	5,892	10	91,690	230,281	183,335	511,208	1,011	8	14,612	54,249	18,580	88,460 [c]	409	0	2,986	13,742	2,620	19,757
1983	10,308	27	49,735	76,913	319,437	456,420	-	-	-	-	-	- [d]	687	0	3,823	4,583	2,042	11,135
1984	8,455	6	67,875	119,381	146,442	342,159	-	-	-	-	-	- [d]	247	351	7,582	8,322	1,481	17,983

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Appendix Table A12. Commercial, subsistence, and sport salmon catch by species, by year for all subdistricts in Norton Sound District, 1961-2004.

ALL SUBDISTRICTS

	Commercial						Subsistence						Sport					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1985	19,491	166	21,968	3,647	134,928	180,200	-	-	-	-	-	- [d]	239	20	1,177	1,138	1,036	3,610
1986	6,395	233	35,600	41,260	146,912	230,400	-	-	-	-	-	- [d]	1,077	19	3,926	3,172	1,719	9,913
1987	7,080	207	24,279	2,260	102,457	136,283	-	-	-	-	-	- [d]	615	924	2,319	1,304	814	5,976
1988	4,096	1,252	37,214	74,604	107,966	225,132	-	-	-	-	-	- [d]	400	782	5,038	2,912	1,583	10,715
1989	5,707	265	44,091	123	42,625	92,811	-	-	-	-	-	- [d]	203	165	4,158	3,564	1,497	9,587
1990	8,895	434	56,712	501	65,123	131,665	-	-	-	-	-	- [d]	364	198	3,305	7,647	925	12,439
1991	6,068	203	63,647	-	86,871	156,789	-	-	-	-	-	- [d]	404	237	5,800	1,738	1,415	9,594
1992	4,541	296	105,418	6,284	83,394	199,933	-	-	-	-	-	- [d]	204	131	4,671	6,403	523	11,932
1993	8,972	279	43,283	157,574	53,562	263,670	-	-	-	-	-	- [d]	595	10	3,783	2,250	691	7,329
1994 [c,e]	5,285	80	102,140	982,389	18,290	1,108,184	7,374	1,161	22,124	71,066	25,020	126,745	600	18	5,547	7,051	536	13,752
1995 [c,e]	8,860	128	47,862	81,644	42,898	181,392	7,766	1,222	23,015	38,594	43,014	113,611	438	104	3,705	928	394	5,569
1996 [c,e]	4,984	1	68,206	487,441	10,609	571,241	7,255	1,182	26,304	64,724	34,585	134,050	662	100	7,289	5,972	662	14,685
1997 [c,e]	12,573	161	32,284	20	34,103	79,141	8,998	1,892	16,476	27,200	26,803	81,370	1,106	30	4,393	1,458	278	7,265
1998 [c,e]	7,429	7	29,623	588,013	16,324	641,396	8,295	1,214	19,007	51,933	20,032	100,480	590	16	4,441	6,939	682	12,668
1999 [c,e]	2,508	0	12,662	0	7,881	23,051	6,144	1,177	14,342	20,017	19,398	61,078	630	0	5,582	3,039	211	9,462
2000 [c,e]	752	14	44,409	166,548	6,150	217,873	4,149	682	17,062	38,308	17,283	77,485	889	45	7,441	2,886	1,097	12,358
2001 [c,e]	213	44	19,492	0	11,100	30,849	5,576	767	14,543	30,253	20,210	71,349	271	39	4,802	360	1,709	7,181
2002 [c,e]	5	1	1,759	0	600	2,365	5,469	763	15,086	64,354	17,817	103,489	802	0	4,211	4,303	818	10,134
2003 [c,e]	12	16	17,058	0	3,560	20,646	5,290	801	14,105	49,674	13,913	83,783	2003 data not yet available					
2004	0	40	42,016	0	6,296	48,352	3,716	428	9,898	66,718	3,695	84,455 [f]	2004 data not yet available					
5-year avg. [a]	698	15	19,076	33,310	5,858	58,957	5,326	838	15,028	40,521	17,724	79,437	636 [g]	20	5,295	3,505	903	10,361
10-year avg. [b]	4,262	45	37,550	230,606	15,152	287,614	6,632	1,086	18,206	45,812	23,808	95,344	658 [h]	36	5,119	3,519	708	10,040

[a] 1999-2003

[b] 1994-2003

[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.

[g] 1998-2002

[h] 1993-2002

[i] Preliminary reported, unexpanded survey results. All subdistricts not surveyed.

Appendix Table A13. Sport salmon harvest by species, by year for the Unalakleet River, 1990-2004.

Year	Chinook	Coho	Chum	Pink	Total
1990	276	1826	298	1180	3,580
1991	296	2,180	497	437	3,410
1992	117	1,555	379	779	2,830
1993	382	643	116	89	1,230
1994	379	2,425	220	402	3,426
1995	259	2,033	207	222	2,721
1996	384	3,411	463	59	4,317
1997	842	2,784	228	1,055	4,909
1998	513	2,742	447	434	4,136
1999	415	2,691	211	2,946	6,263
2000	345	4,150	403	961	5,859
2001	250	2,766	714	188	3,918
2002	544	2,937	607	1,378	5,466
2003	97	1,604	191	29	1,921
2004	Data not available				

Appendix Table A14. Comparative salmon aerial survey escapement indices of Norton Sound streams unless noted otherwise, 1961-2004 .

	Sinuk River					Nome River					Flambeau River				
Year[a]	Chinook	Chum	Pink	Pink & Chum[b]	Coho	Chinook	Chum	Pink	Pink & Chum[b]	Coho	Chinook	Chum	Pink	Pink & Chum[b]	Coho
1961															
1962															
1963						-	126	3719	-	-	-	400	80	-	
1964															
1965						-	294	-	-	-					
1966															
1967															
1968															
1969															
1970															
1971						-	75	7,765	-	-					
1972						-	710	14,960	-	-					
1973						6	1,760	14,940	-	-					
1974		463	7766	-	-	-	854	17,832	-	-	-	190	-	-	-
1975	-	4,662	5,390	-	-	1	2,161	3,405	-	-	-	197	1505	-	-
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			100								-	283	291	-	-
1980	3	2,022	199,000	-	1,002	5	7,745	171,350		1,145	-	-	-	29,190	-
1981	-	5,579	350	-	-	15	1,195	12,565	-	-	-	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[b]	493[b]	284,400[b]	-	192	1	2,084[b]	178,870	-	839	1	3,150[g]	20,200[g]	-	-
1985	4	1,910	8,860	-	33	7	1,967	2,250	-	242	-	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[h]	-	419	0	115	0	-	-
1988	3	2,070	4,652[i]	-	563	3	973	2,490[i]	-	1,108[b]	3	765	10	-	-
1989	-	1,025	31,310	-	75	2	72	1,365	-	375	-	-	-	-	-
1990	-	95	29,040	-	161	-	541	13,085	-	377	-	-	-	-	-
1991	3	5,420	14,680	-	701	11	3,520	4,690	-	611	2	1,607	570	-	-
1992	1	470	292,400	-	422	3	813	255,700	-	691	-	606	180	-	-
1993	7	1,570	5,120	-	104	8	1,520	8,941	-	276	4	1,590	-	-	-
1994	10	1,140	492,000	-	307	2	350	265,450	-	631	1	4,960	290	-	-
1995	-	3,110	1,250	-	290	-	1,865	182	-	517	-	7,205	350	-	68
1996	5	1,815	74,100	-	367	1	799	34,520	-	723	-	5,390	-	-	-
1997	-	2,975	1,200	-	57	4	956	65	-	544	-	905	-	-	96
1998	-	630	372,850	-	322	3	335	179,680	-	515	-	2,828	7180	-	-
1999	-	1,697	180	-	217	-	375	345	-	620	-	55	-	-	42
2000	-	10	12,608	-	912	-	658	6,380	-	1,032	-	819	640	-	11
2001	-	3,746	115[g]	-	750	-	946[g]	790[g]	-	1,307[g]	-	3,612	4	-	213
2002	-	1,682	28,487	-	1,290[g]	-	127[g]	295[g]		1,796	-	1,876	1102	-	186
2003	-	677	9,885		190	8	337	2,841		604	-	647	355	-	71
2004		100[g]	1,267,100[g]		2,085	-	3[g]	707,350[g]		1,687		2,250[g]	200[g]		751

[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.

(Continued)

Appendix Table A14. Comparative salmon aerial survey escapement indices of Norton Sound streams unless noted otherwise, 1961-2004 .

	Eldorado River					Fish River					Boston Creek				
Year	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	-	400	2,000	-	-	21	-	-	25,728	-	67	1,669	-	-	-
1964						-	18,670	10,935	14,550	-	10	3,315	-	-	-
1965															
1966						7	-	-	17,955	-	153	761	-	-	-
1967						-	-	-	13,610	-					
1968						10	-	-	164,000	-	7	2,500	2,500	-	-
1969						-	2,080	124,000	-	-	100	7,000	16,000	-	-
1970						33	76,550	198,000	-	-	246	8,200	12,900	-	-
1971						1	13,185	1,670	-	-	42	7,045	80	-	-
1972						-	3,616	13,050	-	-	57	4,252	3,950	-	-
1973						31	6,887	15,564	-	-	153	3,014	3,213	-	-
1974	13	2,143	6,185	-	-	3	10,945	15,690	-	-	231	2,426	749	-	-
1975						26	20,114	15,840	-	-	147	1,885	2,556	-	-
1976	-	328	1,340	-	-	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	140,600	-	-	136	2,655	74,221	-	-
1979	-	326	652	-	-	11	6,893	9,132	-	-	58	882	271	-	-
1980	6	9,900	55,520	-	56	-	19,100	33,500	-	-	16	2,450	1,510	-	-
1981	-	15,605	495	-	-	90	24,095	450	-	-	-	1,985	-	-	-
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 [i]	4,362 [g]	1,924,935 [g]	-	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	130	-	108	193	7,886	0	-	-	583	3,640	0	-	-
1988	17	2,645	1,045	-	78	36	1,240	29,950 [i]	-	-	163	1,015	7,400 [i]	-	-
1989	-	350	1,550	-	87						-	-	-	-	-
1990	17	884	2,050	-	44						112	1,455	8,440	-	-
1991	76	5,755	1,590	-	98	58	10,470	51,190	-	-	152	2,560	3,210	-	-
1992	2	4,887	6,615	-	113	4	390	1,387,000	-	-	68	1,540	50,850	-	-
1993	38	2,895	120	-	111	48	12,695	13,440	-	-	227	4,563	1,930	-	-
1994	-	5,140	53,890	-	242	55	16,500	910,000	-	-	95	4,270	355,600	-	-
1995	4	9,025	50	-	247	40	13,433	780	-	1,829	78	4,221	-	-	230
1996	21	20,710	40,100	-	254	189	5,840 [i]	684,780	-	-	-	3,505 [i]	35,980	-	-
1997	40	5,967	10	-	37	110	19,515	800	-	465	452	4,545	-	-	-
1998	-	3,000	123,950	-	71	96	28,010	663,050	-	-	255	1,570	175,330	-	-
1999	2	1,741	6	-	45	-	50	20	-	821	-	-	-	-	319
2000	2	3383	16,080	-	24	-	-	-	-	805	-	-	-	-	414
2001	2	4,450	8	-	232	8	3,220	1,744	-	1,055	33	3,533	1,038	-	155
2002	8	139	58,700	-	463										
2003	12	1,257	821	-	71	95	3,200	1,014	-	-	145	750	701	-	
2004	-	109 [g]	52,000 [g]		755	19	621	404,430		90	93	55	135,000		140

[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.

(Continued)

Appendix Table A14. Comparative salmon aerial survey escapement indices of Norton Sound streams unless noted otherwise, 1961-2004 .

	Niukluk River					Kwiniuk River					Tubutulik River				
Year	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	-	-	27,878	-	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	8,668	-	-					
1966	-	21,300	8,600	4,700	-	7	32,786	10,629	-	-	-	5,514	26,000	-	-
1967	-	20,546	-	-	-	13	24,444	3,587	-	-	1	-	-	22,475	-
1968	-	-	-	87,093	-	27	18,813	129,052	-	-					
1969	-	10,240	92,650	-	-	12	19,687	56,683	-	-	3	12,040	12,788	3,045	-
1970	-	7,300	60,350	-	-	-	68,004	226,831	-	-	-	53,290	136,590	-	-
1971	-	22,605	8,370	-	-	37	39,046	16,634	-	-	-	16,820	7,500	5,065	-
1972 [e]	-	10,500	22,600	-	-	65	30,686	62,461	-	-	-	8,070	21,100	-	-
1973	-	15,156	14,790	-	-	57	28,617	37,070	-	-	131	5,383	15,665	-	-
1974	1	8,720	8,915	-	-	62	35,899	39,375	-	-	136	9,560	17,940	-	-
1975	-	10,089	16,258	-	-	44	14,344	55,293	-	-	7	17,141	38,003	-	-
1976	-	4,130	7,190	-	-	12	6,977	35,226	-	375 [e]	-	1,095	6,095	2,600	-
1977	19	10,456	4,150	-	-	84	22,757	47,934	-	-	-	8,540	4,685	-	-
1978	2	14,365	208,300	-	-	74 [e]	14,408 [e]	70,148 [e]	-	-	2	5,865	1,364	-	-
1979	8	1,282	2,119	-	-	107	12,355	167,492	-	-	-	812	1,624	-	-
1980	-	8,915	75,770	-	-	177	19,374	319,363	-	-	405	21,616	663,937	-	-
1981	-	7,249	-	-	-	136	34,561	566,417	-	-	30	2,105	480		
1982	20	2,557	227,440	-	-	138	44,036	469,674	-	-	49	2,044	53,605	-	-
1983	54	8,886	50	-	-	267	56,907	251,965	-	-	135	16,345	40,797	-	-
1984 [f]	6	34,572	22,636		998	736	54,043	736,544	-	983 [f]	270	56,210	93,600	-	-
1985	25	11,140	-	-	332 [k]	712	9,912	18,237	-	673 [f]	472	13,645	8,940	-	-
1986	2	2,442	0	-	-	653	24,704	241,446	-	421 [f]	453	5,975	35,680	-	-
1987	10	4,145	0	-	257 [k]	314	16,134	5,567	-	819 [f]	474	9,605	580	-	-
1988	18	6,521	8,160 [f]	-	1,095 [k]	321	13,301	187,991	-	444 [f]	561	4,662	114,340	-	-
1989	-	-	-	-	182 [k]	282	13,689	27,487	-		-	-	-	-	-
1990	15	6,200	115,250	-	170	744	13,735	416,511	-	746 [f]	397	4,350	186,400	-	-
1991	42	10,700	37,410	-	1,783	587	18,802	53,499	-	809 [f]	661	7,085	26,870	-	-
1992	-	7,770	803,200	-	812	479	12,077	1,464,717	-	532 [f]	260	2,595	138,600	-	-
1993	15	19,910	2,840	-	2,104	565	15,823	43,065	-	1,238 [f]	1,061	8,740	18,650	-	1,395
1994	7	16,470	1,294,100	-	274	627	33,010	2,304,099	-	2,547 [d]	No survey due to poor conditions				
1995	48	25,358	200	-	2,136	468	42,161	17,509	-	1,625 [f]	377	16,158	4,020	-	930
1996	25	9,732 [f]	153150	-	2,047	567	27,256	907,894	-	1,410 [f]	439	10,790	226,750	-	-
1997	131	16,550	-	-	983	972	20,118	9,536	-	610 [f]	1,946	3,105	16,890	-	-
1998	51	2,556	205,110	-	593	296	24,248	655,933	-	610 [f]	894	10,180	1,124,800	-	-
1999	-	640	-	-	619	115	8,763	608	-	223 [f]	-	-	-	-	-
2000	-	-	-	-	3,812	144	12,878	750,173	-	541 [f]	-	-	-	-	0
2001	6	2,448	2,856	-	1,122	258	16,598	8,423	-	9,532 [d]	77	863	-	- -	
2002	-	-	-	-	1,122	778	37,995	111,410	-	6,459 [d]	42	180	182,000	- -	
2003	55	2,315	272		146	744	12,123	22,329		5,490 [d]	50	1,352	60	-	292
2004	15	173	277,900		828	81	1,132	948,000		1,237	321	1,117	391,000		779

[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.

(Continued)

Appendix Table A14. Comparative salmon aerial survey escapement indices of Norton Sound streams unless noted otherwise, 1961-2004 .

	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					
1966	153	-	-	16,600	-
1967					
1968					
1969					
1970 [a]	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]	196	826	143,789	-	-
1975 [a]	60	5,237	17,885	-	-
1976 [a]	66	1,963	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	168,902	-	4,145
1983	347	4,135	4,980	-	-
1984 [d]	2,844	2,915	458,387	-	152
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 [l]	-	240
1989 [a]	-	-	-	-	-
1990	255	1,345	25,685	-	-
1991	656	2,435	119,140	-	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 [k]
1996	106	270 [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					
2001	367	330	-	-	-
2002	122	217	45,950	-	800
2003	131	222	11,010	-	-
2004	189	283	264,000		1,386

[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. Comparative sockeye salmon aerial survey indices, Port Clarence District, 1963-2004

Year	Salmon Lake	Grand Central River	Total
1963	866	620	1,486
1964 [a]	76	590	666
1965	250	160	410
1966	1,120	370	1,490
1967	129	280	409
1968 [a]	830	645	1,475
1969	24	171	195
1970 [b]	-	-	-
1971	538	512	1,050
1972 [a]	680	300 [c]	980
1973	1,747	607	2,354
1974	820	-	820
1975	537	123	660
1976	132	22	154
1977	317	235	552
1978	822	280	1,102
1979	1,250	261	1,511
1980 [a]	512	175	687
1983	970	-	970
1984	445	30	475
1985	730	250	980
1986	2,125	160	2,285
1987	4,040	530	4,570
1988	1,195	6	1,201
1989	3,055	525	3,580
1990	2,834	926	3,760
1991	3,790	1,570	5,360
1992	1,500	[b]	1,500
1993	2,885	216	3,092
1994	3,740	1,230	4,970
1995	5,433	628 [d]	6,061
1996	6,610	770	7,380
1997	8,760	1,520	10,280
1998	5,210	1,977	7,187
1999	31,720	1,780	33,500
2000	12,772	[b]	12,772
2001	9,400	155	9,555
2002	3,520	71	3,591
2003	19,275	1,015	20,290
2004	23,005	2,855	25,860

[a] Poor survey.

[b] No survey made.

[c] Boat survey.

[d] Early count

Appendix Table B2. Subsistence surveys conducted in Port Clarence District 1963 - 2004.

Year		Number of Fishing Families Interviewed	Chinook	Sockeye	Coho	Pink	Chum	Total
1963		19	9	4,866	25	1,061	1,279	7,240
1964		22	17	1,475	227	371	1,049	3,139
1965		29	36	1,804	639	1,854	1,602	5,935
1966		26	10	1,000	896	859	2,875	5,640
1967		19	12	2,068	232	767	1,073	4,152
1968		24	40	688	133	1,906	904	3,671
1969		13	2	180	27	548	932	1,689
1970		18	4	588	1,071	1,308	4,231	7,202
1971		22	31	850	959	1,171	3,769	6,780
1972		8	4	68	388	75	2,806	3,341
1973		4	22	46	280	424	1,562	2,334
1974		13	-	28	62	14	2,663	2,767
1975		17	-	244	5	743	1,589	2,581
1976		15	7	291	20	436	6,026	6,780
1977	[a]	13	-	-	-	-	-	5,910
1978		26	1	392	-	7,783	705	8,881
1979		26	-	320	35	741	1,658	2,754
1980		22	7	3,195	5	3,170	1,715	8,092
1981		10	8	255	110	765	5,845	6,983
1982		27	23	405	100	4,345	684	5,557
1983	[b]	3	17	261	-	615	299	1,192
1984 - 1988	[c]							
1989	[d]	15	28	535	472	395	410	1,840
1990 - 1993	[c]							
1994	[e]	127	181	1,979	1,692	3,849	2,042	9,743
1995	[e]	122	76	4,481	1,739	3,293	6,011	15,600
1996	[e]	117	195	4,558	2,079	2,587	1,264	10,684
1997	[e]	126	158	3,177	829	755	2,099	7,019
1998	[e]	138	287	1,665	1,759	7,812	2,621	14,144
1999	[e]	155	89	2,392	1,030	786	1,936	6,233
2000	[e]	134	72	2,851	935	1,387	1,275	6,521
2001	[e]	160	84	3,692	1,299	1,183	1,910	8,167
2002	[e]	159	133	3,732	2,194	3,394	2,699	12,152
2003	[e,f]	204	177	4,495	1,434	4,113	2,430	12,649
2004	[g,h]	376	276	8,288	1,031	5,817	2,501	17,913

[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.

[f] Includes harvest reported from Pilgrim River permits. 101 permits were issued and 79 returned.

[g] Preliminary.

[h] This was the first year a permit was required for Port Clarence (including Pilgrim River). 372 permits were issued and 367 returned.

Appendix Table C.1. Kotzebue District chum salmon catch statistics, 1962-2004.

Year	Total Catch	Total Days [a]	Boat Days [b]	Catch/Boat Day	Number Fishers [c]	Season Catch per Fisher
1962	129,948	21.0	793	164	84	1,547
1963	54,445	20.0	693	79	61	893
1964	76,449	27.0	560	137	52	1,470
1965	40,025	32.0	410	98	45	889
1966	30,764	35.0	548	56	44	699
1967	29,400	33.0	556	53	30	980
1968	30,212	34.0	858	35	59	512
1969	59,335	40.0	798	74	52	1,141
1970	159,664	32.0	1,368	117	82	1,947
1971	154,956	29.0	1,468	106	91	1,703
1972	169,664	35.0	2,095	81	104	1,631
1973	375,432	25.0	2,217	169	148	2,537
1974 [d]	627,912	32.0	3,769	167	185	3,394
1975 [e]	563,345	39.0	4,301	131	267	2,110
1976	159,796	16.0	2,236	71	220	726
1977	195,895	21.0	2,353	83	224	875
1978	111,494	23.0	2,738	41	208	536
1979	141,623	21.0	2,462	58	181	782
1980	367,284	27.0	2,559	144	176	2,087
1981	677,239	27.0	3,336	203	187	3,622
1982	417,790	23.5	3,115	134	199	2,099
1983	175,762	12.5	1,557	113	189	930
1984	320,206	19.5	2,432	132	181	1,769
1985	521,406	25.5	3,376	154	189	2,759
1986	261,436	15.5	2,049	128	187	1,398
1987	109,467	11.5	1,160	94	160	684
1988	352,915	21.5	2,761	128	193	1,829
1989	254,617	22.2	1,961	130	165	1,543
1990	163,263	11.5	1,760	93	153	1,067
1991	239,923	22.5	1,795	134	142	1,690
1992	289,184	17.0	1,513	191	149	1,941
1993 [f]	73,071	7.0	431	170	114	641
1994 [g]	153,452	9.8	426	360	109	1,408
1995	290,730	9.7	282	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
2001 [I]	211,672	15.3	307	689	66	3,207
2002	8,390	14	19 [k]	442	3	2,797
2003 [j]	25,423	25	33 [k]	770	4	6,356
Average	204,827	22	1,481	238	121	1,786
2004	51,038	27	139 [l]	367	43	1,187

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 fishers.

d Includes 6,567 chum salmon frpm 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.

j An additional 340 chum salmon from the commercial catch were kept for subsistence use.

k In 2002-2003 the season was open continuously and boat days are days fished.

l Although the season was open continuously from July 12 to August 31, boat days are calculated only from hours the buyer reported as have being fished.

Appendix Table C2. Kotzebue District chum salmon type of processing and weights, 1962-2004.

Year	Chum Salmon Cases (48lbs)	Chum Salmon Fresh Frozen (Round weight in pounds)	Other [a]	Fresh Frozen Salmon Roe (pounds)	Cured Pounds
1962	14,500				
1963	5,396				
1964	5,421	202,993			
1965	1,929	207,350			
1966		310,716		13,600	3,065
1967		273,420			11,488
1968		288,500			11,850
1969		455,013			8,183
1970		1,240,000			48,377
1971		1,264,753			27,542
1972		1,547,041			55,376
1973		3,416,431			144,768
1974		5,361,130 [b]			
1975		4,877,313 [c]			
1976		1,415,549	487		
1977		1,846,340	1,075		
1978		1,009,121	32,419		
1979		1,236,429	6,155		
1980		3,160,948	7,828		
1981		6,139,518	2,210		
1982		3,833,051	790	100	
1983		1,647,160	2,449		
1984		2,631,582	1,593		
1985		4,528,379	1,106		
1986		2,271,320	1,691		
1987		900,405	597		
1988		3,060,292	2,120		
1989		2,163,174	1,426		
1990		1,453,040	538		
1991		1,951,041	714		
1992		2,397,302	2,714		
1993 [d]		613,968	1,507	1,000	
1994 [e]		1,166,494	73		
1995		2,329,898	93		
1996 [f]		97,510	51		
1997		1,141,741	649		
1998		447,256	2,971		
1999		1,108,898	87		
2000		1,370,637	106		
2001		1,847,361	64		
2002		74,341	0		
2003		218,091	0		
2004		419,059	1,450		

[a] Chinook, pink salmon, and Dolly Varden.

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

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

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

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

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

Appendix Table C3. Kotzebue District mean prices paid per pound to salmon fishers by species, 1962-2004.

Year[a]	Chum Salmon Average Weight	Chum Salmon Average Price	Chinook Salmon	Pink Salmon	Inconnu	Dolly Varden
1962		$0.35 [c]				
1963		$0.35 [c]				
1964	8.3	$0.45 [c]				
1965	9.0	$0.45			$1.30 [c]	
1966	10.1	$0.11			$1.40 [c]	$0.55
1967	9.3	$0.11			$1.50 [c]	$0.75
1968	9.7	$0.14			$0.91 [c]	$0.98
1969	7.5	$0.15			$1.30 [c]	$2.84
1970	8.1	$0.15				
1971	8.1	$0.16			$0.16	$0.17
1972	9.1	$0.17			$0.20	$0.17
1973	9.1	$0.25			$0.30	$0.16
1974 [b]	8.5	$0.34			$0.30	$0.16
1975 [b]	8.6	$0.28			$0.30	$0.30
1976	8.9	$0.41			$0.30	$0.30
1977	9.6	$0.56			$0.30	
1978	9.1	$0.57			$0.30	$0.25
1979	8.8	$0.80				$0.25
1980	8.6	$0.46			$0.10	$0.20
1981	9.1	$0.53			$0.75	$0.17
1982	9.3	$0.51	$1.25	$0.15	$0.75	$0.20
1983	9.4	$0.25	$1.08	$0.13		$0.20
1984	8.2	$0.44	$1.03			$0.25
1985	8.7	$0.47	$1.25			$0.25
1986	8.7	$0.41	$1.25			$0.20
1987	8.2	$0.57	$1.25			$0.30
1988	8.7	$0.85	$1.98			$0.35
1989	8.5	$0.28	$1.72			$0.28
1990	8.9	$0.31	$2.00			$0.25
1991	8.1	$0.22	$1.64		$0.50	$0.18
1992	8.3	$0.22	$1.89		$0.58	$0.10
1993	8.5	$0.38	$2.37		$0.50	$0.10
1994	7.8	$0.20	$1.14			$0.17
1995	8.0	$0.13	$1.00		$0.50	$0.20
1996	8.0	$0.09	$1.00		$0.44	$0.25
1997	8.0	$0.16	$1.02			$0.20
1998	8.0	$0.15	$1.00			$0.20
1999	8.0	$0.16	$1.00			$0.20
2000	8.6	$0.18	$1.00			$0.20
2001	8.7	$0.17	$1.00			
2002	8.9	$0.10				
2003	8.6	$0.12				$0.50
2004	8.2	$0.15	$0.72			$0.26

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

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

[c] Price per fish.

Appendix Table C4. Kotzebue District commercial fishery dollar value estimates, 1962-2004.

Year	Gross Value of [a] Catch to Fishers
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
2001	$322,650
2002	$7,572
2003	$26,377
Average	$630,285
2004	$64,420

[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 C5. Kotzebue District commercial and subsistence salmon catches, 1914-2004.

	Commercial Catch			Subsistence Chum Salmon Catch			
Year [a]	Chum [b]	Other [c]	Total	Chum	Number of Fishers Interviewed	Average Catch per Fisher	Total Documented Catch
1914	8,550		8,550				
1915	4,750		4,750				
1916	19,000		19,000				
1917	44,612		44,612				
1918	27,407		27,407				
1957				298,430 [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 [h]	66	235	335,821
1985	521,406	63	521,469	13,494 [i]	243	56	534,963
1986	261,436	106	261,542	36,311	837	43	297,853
1987	109,467	44	109,511	[j]	[j]	[j]	109,511
1988	352,915	152	353,067	[j]	[j]	[j]	353,067
1989	254,617	87	254,704	[j]	[j]	[j]	254,704
1990	163,263	32	163,295	[j]	[j]	[j]	163,295
1991	239,923	44	239,967	[j]	[j]	[j]	239,967
1992	289,184	204	289,388	[j]	[j]	[j]	289,388
1993	73,071 [k]	131	73,202	[j]	[j]	[j]	73,202
1994	153,452 [l]	3	153,455	36,226 [n]	375	97	189,681
1995	290,730	5	290,735	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
2002	8,390	0	8,390	16,880 [n,o]	191	88	25,270
2003	25,423	0	25,423	19,201 [n]	446	43	44,624
2004	51,038	243	51,281	2004 data not yet available			
1979-2003 Average	225,380	174	225,554	1994-2003 Average 28,399	247	99	255,090

[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 Sikusuilaq 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.
[o] Only 2 of 6 villages surveyed.

Appendix Table C6. Kotzebue District subsistence chum salmon catches by village, 1962-2004.

	Village					Kobuk River	Noatak	Village						District
Year	Noorvik	Kiana	Ambler	Shungnak	Kobuk	Villages	Village	Kotzebue	Deering	Kivalina	Buckland	Candle	Shishmaref	Total
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 [a,e]
1982	7,433	4,918	2,506	4,191	600	19,648	5,479	4,099	807	210	[b]	[b]	[b]	30,243 [a]
1983 [a,d]	277	223	1,062	3,556	368	5,486	4,035	347	219	200	[b]	[b]	[b]	10,287
1984 [a,e]	[b]	[b]	2,990	4,241	[b]	7,231	6,049	88 [a]	1,940	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
2002	13,943	[f]	[f]	[f]	[f]	[f]	2,937	[f]	[b]	[b]	[b]	[b]	[b]	16,880
2003	7,982	3,010	1,719	28+60	1,453	14,164	2,177	[b]	[b]	[b]	[b]	[b]	[b]	16,341
2004	2004 subsistence catches not yet available													

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

[b] Not surveyed.

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

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

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

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

Appendix Table C7. Kotzebue District mean subsistence chum salmon catch per fisher by village, 1962-2004.

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]
2002	[a]	29	124	[a]	[a]	[a]	[a]	[a]
2003	[a]	21	59	33	28	87	63	[a]
2004	2004 subsistence catches not yet available							

[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 interveiws 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, 1962-2004. (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 [b,j]	89,798	6,152 [b,j]	101,640	29,120 [b]	39,394	33,945	
Eli River	9,080 [d]	35			120		5,502 [f]	68 [f]	138,145
Kelly River & Lake	1,818 [d]	600		3,155	570	225	375	150	
Noatak River System Total	178,898	2,605	89,798	9,307	102,330	29,345	45,271	34,163	
Kobuk Drainage									
Kobuk to Pah River		400		1,750	266		530		
Pah River to just below Selby River		1,530		500			50		1,753
Selby River mouth & Slough		1,045		500	630	1,625	70		20
Selby R. mouth to Beaver C.		1,095				75	170		4,820
Beaver Creek mouth					460	795	1,550		2,385
Above Beaver Creek		465			118				4,930
Upper Kobuk River Total	9,224 [d]	4,535	7,985 [g]	2,750	1,474	2,495	2,370	7,500 [c]	
									13,908
Squirrel River	5,834 [d]	2,200	8,009	7,230	1,350	3,332	6,746	6,714	
Salmon River	12,936 [d]	1,535	9,353	1,500 [b]	3,957	2,116	3,367	2,561	4,418
Tutuksuk River	10,841 [d]	670	2,685		1,383	169	823 [b]	159	3,000 [b]
									2,000 [b]
Kobuk River System Total	38,835 [c]	8,940	28,032	11,480	8,164	8,112 [c]	13,306	16,934	

(continued)

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

(continued)

Stream[a,b]	1998	1999	2000[k]	2001	2002	2003	2004	Aerial Escapement Goals
Noatak Drainage								
Noatak River below Kelly River	[b]				700	34,575	49,541	
Eli River	[b]						2,917	
Kelly River & Lake	2,631				1,116	1,566	2,987	
Noatak River System Total	[b]	84,085				36,141	55,445	64,000-120,000
Kobuk Drainage								
Kobuk to Pah River	[b]			2,790		5,501	7,493	
Pah River to just below Selby River	[b]			1,380	857	828	1,885	
Selby River mouth & slough	[b]			1,780	2,100	1,110	3,846	
Selby River	730					427	3,760	
Selby R. mouth to Beaver C.	[b]			7,470		1,274	6,215	
Beaver Creek mouth	[b]							
Above Beaver Creek	[b]				490	2,462		
	[b]							
Upper Kobuk River Total	[b]	27,340		13,420	3,447	11,602	23,199	8,000-16,000
Squirrel River	[b]	13,513				[b]		7,200-14,400
Salmon River	[b]	4,989				[b]		3,200-6,400
Tutuksuk River	[b]	2,906				[b]		1,200-2,400
Kobuk River System Total		48,748		13,420	3,447	11,602	23,199	19,600-39,200

[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 discrepencies 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 survey conditions.

[k] No surveys flown.

Appendix Table D1. Norton Sound herring and spawn-on-kelp harvests (in tons) by U.S. commercial fishers, 1909-2004.

Year	Sac Roe Herring	Food or Bait Herring	Total	Spawn on Kelp
1909-1916 [a]	-	-	-	-
1916-1928	-	1,881	1,881	-
1929	-	166	166	-
1930	-	441	441	-
1931	-	86	86	-
1932	-	529	529	-
1933	-	31	31	-
1934	-	4	4	-
1935	-	15	15	-
1936	-	-	-	-
1937	-	6	6	-
1938	-	10	10	-
1939	-	6	6	-
1940	-	14	14	-
1941	-	3	3	-
1942-1963	-	-	-	-
1964	20	-	-	-
1965	-	-	-	-
1966	12	-	-	-
1967	-	-	-	-
1968	-	-	-	-
1969	2	-	-	-
1970	8	-	-	-
1971	20	-	-	-
1972	17	-	-	-
1973	35	-	-	-
1974	2	-	-	-
1975	-	-	-	-
1976	9	-	-	-
1977	11	-	-	trace
1978	15	-	-	4
1979	1,292	-	-	13
1980	2,451	1	2,452	24
1981	4,371	-	-	47 [b]
1982	3,864	69	3,933	38
1983	4,181	401	4,582	29 [c]
1984	3,298	274	3,572	19 [d]
1985	3,420	128	3,548	- [e]
1986	4,926	268	5,194	-
1987	3,779	303	4,082	-
1988	4,256	416	4,672	-
1989	4,494	247	4,741	-
1990	5,253	1,026	6,279	-
1991	5,465	207	5,672	-
1992 [f]	-	-	-	-
1993	4,713	321	5,034	-
1994	958	2	960	-
1995	6,647	116	6,763	-
1996 [g]	6,061	109	6,220	-
1997 [h]	3,709	262	3,976	-
1998	2,623	8	2,631	9 [i]
1999	2,693 [j]	53	2,761	4
2000	4,487 [k]	-	4,487	2
2001	2,245	-	2,245	2
2002	1,059	64	1,123	-
2003	1,587	21	1,608	2
2004	-	11	11	-

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

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

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

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

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

[f] No commercial fishery took place in 1992.

[g] Total includes an estimate 50 st of wastage.

[h] Total includes an estimate 5 st of wastage. Includes approximately 1000 lbs taken as bait under 5 AAC 27.971.

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

Appendix Table D3. Commercial herring fishery summary information, Norton Sound District, 1979-2004.

Year	Est. biomass (tons)	Catch Gillnet (tons)	Beach Seine (tons)	Wild Kelp (tons)	*Macrocystis* Kelp (lbs.)	No. of Fishers	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	6,033	614			215	4.2	6	10.4	24-May	23-May/30-May
1996	26,596	5,581	589			287	4.5	10	10.6	25-May	24-May/25-May
1997	47,748	3,459	513			220	0.6	9	9.9	22-May	20-May/24-May
1998	52,033	2,632	0	1	16,083	47	0.2	2	9.2	25-May	22-May/9-Jun
1999	34,314	2,755	0		7,482	122	0.6	4	10.5	17-Jun	13-Jun/22-Jun
2000	32,680	4,390	81		4,500	97	0.8	4	9.5	11-Jun	7-Jun/15-Jun
2001	26,305	2,245	0		4,400	76	0.3	3	12.3	12-Jun	12-June/16-June
2002	27,068	1,123	0		0	46	0.1	2	10.6	24-May	22-May/3-June
2003	32,918	1,608	0		1,750	32	0.2	2	10.5	18-May	16-May/25-May
2004	34,180	11	0	0	0	4	0.0	0		24-May [b]	

[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, 1979-2004.

	Subdistricts							
Year[a]	s.d. 1	s.d. 2	s.d. 3	s.d. 4	s.d. 5	s.d. 6	s.d. 7	Totals
1979	319	405	555	0	0	0	14	1,293
1980	1,176	632	632	5	0	7	0	2,452
1981	3,068	831	471	1	0	0	0	4,371
1982	2,062	946	925	0	0	0	0	3,933
1983	434	1,265	2,733	0	65	85	0	4,582
1984	-	-	3,572	0	0	0	0	3,572
1985	1,538	188	1,675	0	147	0	0	3,548 [b]
1986	2,559	-	2,450	0	185	0	0	5,194
1987	2,218	174	1,690	0	0	0	0	4,082
1988	3,260	99	1,307	0	6	0	0	4,672
1989	3,256	60	1,425	0	0	0	0	4,741 [c]
1990	4,498	950	931	0	0	0	0	6,379 [d]
1991	0	880	4,792	0	0	0	0	5,672 [e]
1992 [f]	0	0	0	0	0	0	0	0
1993	2,288	587	1,881	0	278	0	0	5,034 [g]
1994	250	36	634	0	40	0	0	960
1995	2,359	604	1,524	0	2,108	167	0	6,762
1996	3,074	111	2,831	0	153	0	0	6,170 [h]
1997	2,046	62	1,864	0	0	0	0.5 [j]	3,976 [i]
1998	1,543	0	1,081	0	0	0	0	2,624
1999	285	323	2,050	0	0	0	8	2,746 [k]
2000 [l]	2,623	81	1,767	0	0	0	0	4,471
2001 [l]	898	0	1,347	0	0	0	0	2,245
2002 [l]	373 [a]	0	750 [a]	0	0	0	0	1,123 [a]
2003 [l]	283	0	1,325	0	0	0	0	1,608 [a]
2004	0	0	0	0	0	0	11	11 [a]

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

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

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

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

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

[f] No commercial fishery in 1992.

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

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

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

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

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

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

Appendix Table D5. Port Clarence District commercial herring fishing history.

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

G/N= gillnet

Appendix Table B1. Historical commercial summer harvest of red king crab from Norton Sound Section, Eastern Bering Sea, by statistical areas, 1977-2004 (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-

Appendix Table E1. (page 2 of 2)

Statistical Area	1990	1991[a]	1992	1993	1994	1995	1996[b]	1997	1998	1999	2000	2001	2002	2003	2004	Total
616331					48					633	4,557		3,506	646		9,390
616401						35										35
626331							61						2,455			2,538
626401						18,971	45,045	18,066	8,065	508	4,689	61,620	53,722	15,899	23,113	254,927
626402														1,352		1,352
636330							4,560	3,838	2,449			2,253				13,100
636401			1,159	1,373	8,087	24,329	70,677	59,206	10,771	14,201	126,994	91,343	50,906	83,949	166,489	844,793
636402					1,754	3,466										5,220
646301						4,628	13,888									18,516
646330						1,493	2,894	314		3,021		1,868	1,955		2,226	23,699
646401				1,963	37,222	105,045	22,834	1,052	3,194	221		4,287		3,952	1,964	356,557
646402				730	143,511	66,821										211,810
656300														14	932	177,819
656330			4,814	265		19,745	15,446	4,661	4,078	1,300		20,869	12,374	21,176	46,288	1,179,163
656401	171		53,119	105,341	29,566	32,289	9,985	4,035	1,127	2,739	94,813	55,158	63,038	40,566	21,579	1,988,300
656402				193,079	106,053	44,000								1,441		772,653
666230																77
666300							25,519									185,005
666330	27,185		4,305	31,758		730					5,839	7,030	1,332	1296	12,359	1,204,287
666401	162,263		10,632	746	396		3,001	1,816		930	60,762	43,771	35,970	83,998	42,452	2,643,558
666402				535	1,221								30,070	12,873	23,344	837,139
666431						1,124							4,274	45		151,472
676300							546									126,777
676330																107,294
676400	3,212						9,775									140,737
676430																17,366
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	259,602	267,207	340,746	13,885,228

[a] No commercial fishery occured in 1991.

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

Appendix Table E2. The results of the population assessment surveys conducted for red king crab in Norton Sound since 1976.

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

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

[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] 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.

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

[e] 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.

Appendix Table E3. Historical summer commercial red king crab fishery economic performance, Norton Sound Section, Eastern Bering Sea, 1977 - 2004.

Year	Guidline Harvest Level (lbs) [b]	Legal Male Pop. Est. No. crab (millions)	Legal Male Pop. Est. lbs [b]	Commercial Harvest (lbs) [a,b] Open Access	Commercial Harvest (lbs) [a,b] CDQ	Number of Vessels	Number of Permits	Number of Landings	Number of Pots Registered	Number of Pots Pulls	Exvessel Price/lb	Fishery Value (millions $)	Season Length Days	Season Length Dates
1977	[d]	1.7	5.1	0.52		7	7	13	[d]	5,457	0.75	0.229	60	[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]
2002	0.24	1.0	3.1	0.24	0.01	28	32	164	1,120	6,491	2.81	0.729	77	6/15-9/3 [m]
2003	0.25	1.0	3.1	0.25	0.01	24	30	218	960	8,494	3.09	0.823	68	6/15-8/24 [n]
2004	0.35	1.6	4.4	0.31	0.03	26	29	208	1,120	7,418	313.00	1.063	41	6/15-8/8 [o]

[a] Deadloss included in total.

[b] Millions of pounds.

[c] No summer commercial fishery.

[d] Information not available.

[e] Fishing actually began 8/12.

[f] Fishing actually began 7/8.

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

[h] First delivery was made 7/10.

[i] First delivery was made 7/16.

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

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

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

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

[n] Open Access fishery was open 7/1/03-8/13/03. CDQ fishery was open 6/15/03-6/28/03 and 8/15/03-8/24/03.

[o] Open Access fishery was 7/1/04-8/8/04. CDQ fishery was 6/15/04-6/28/04

Appendix Table E4. Percentage of recruit and postrecruit male red king crab from summer commercial fishery catch samples in Norton Sound Section, Bering Sea, 1977-2004.

Year	Recruits[a] %	Postrecruits[b] %
1977	53	47
1978	29	71
1979	33	67
1980	15	85
1981	10	90
1982	27	73
1983	55	45
1984	59	41
1985	45	55
1986	49	51
1987	22	78
1988	25	75
1989	23	77
1990	21	79
1991 [c]	-	-
1992	28	72
1993	31	69
1994	20	80
1995	36	64
1996	30	70
1997	49	51
1998	32	68
1999	42	58
2000	41	60
2001	33	67
2002	33	67
2003	48	52
2004	49	51

[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 E5. Winter commercial and subsistence red king crab harvests, Norton Sound, Eastern Bering Sea, 1978 - 2004.

Commercial			Subsistence						
Year[a]	Fishers	# Crab Harvested	Winter[b]	Permits Issued	Permits Returned	Permits Fished	Total Crab Caught[c]	Total Crab Harvested[d]	Average/ permit fished
1978	37	9,625	1977-78	290	206	149	*	12,506	84
1979	1	221	1978-79	48	43	38	*	224	6
1980	1	22	1979-80	22	14	9	*	213	24
1981	0	0	1980-81	51	39	23	*	360	16
1982	1	17	1981-82	101	76	54	*	1,288	24
1983	5	549	1982-83	172	106	85	*	10,432	123
1984	8	856	1983-84	222	183	143	15,923	11,220	78
1985	9	1,168	1984-85	203	166	132	10,757	8,377	63
1986	5	2,168	1985-86	136	133	107	10,751	7,052	66
1987	7	1,040	1986-87	138	134	98	7,406	5,772	59
1988	10	425	1987-88	71	58	40	3,573	2,724	68
1989	5	403	1988-89	139	115	94	7,945	6,126	65
1990	13	3,626	1989-90	136	118	107	16,635	12,152	114
1991	11	3,800	1990-91	119	104	79	9,295	7,366	93
1992	13	7,478	1991-92	158	105	105	15,051	11,736	112
1993	8	1,788	1992-93	88	79	37	1,193	1,097	30
1994	25	5,753	1993-94	118	95	71	4,894	4,113	58
1995	42	7,538	1994-95	167	71	57	5,918	4,059	71
1996	9	1,778	1995-96	84	44	35	2,936	1,679	48
1997	2	83	1996-97	38	22	13	1,617	745	57
1998	5	984	1997-98	94	73	64	20,327	8,622	135
1999	5	2,714	1998-99	95	80	71	10,651	7,533	106
2000	10	3,045	1999-2000	98	64	52	9,816	5,723	107
2001	3	1,098	2000-01	50	27	12	366	256	21
2002	11	2,591	2001-02	114	101	67	8,805	3,669	55
2003	13	6,853	2002-2003	107	73	64	9,052	4,140	65
2004	2	522	2003-2004	96	77	41	1,775	1,181	29
Avg 1978-2002	9	2240	Avg 1977-2002	111	85	66	8318	5067	67

[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.

[e] Information not available.

Appendix Table E6. Size composition by percent of red king crab from winter research pots near Nome, Norton Sound, Bering Sea, 1983-2004.

	SUBLEGAL[a]			LEGAL[a]		
Year	Prerecruit Twos	Prerecruit Ones	Totals	Recruits	Post-Recruits	Totals
1983	26	38	64	26	10	36
1984	35	31	66	19	16	35
1985	25	45	70	20	10	30
1986	26	35	61	22	17	39
1987	13	31	44	11	45	56
1988 [b]	-	-	-	-	-	-
1989	27	15	42	27	31	58
1990	16	33	49	25	26	51
1991	5	30	35	34	31	65
1992 [c]	-	-	-	-	-	-
1993	3	9	12	17	71	88
1994 [c]	-	-	-	-	-	-
1995	10	11	23 [d]	32	45	77
1996	22	33	64 [d]	10	26	36
1997	32	21	64 [d]	14	22	36
1998	36	44	82 [d]	9	9	18
1999	7	42	49 [d]	39	11	50
2000	16	20	36 [d]	39	25	64
2001	23	16	39 [d]	14	48	61
2002	43	26	79 [d]	9	12	21
2003	20	42	66 [d]	20	14	34
2004	9	40	49	37	13	50

[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- 2004.

Year [b]	No. of Fishers	No. of Fish	Pounds[a] Total	Pounds[a] Average	Price/ Pound	Estimated Value
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 [e]						
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 [e]						
1998	1	254	2,400	9.4	$0.43	$1,032
1999 [e]						
2000 [e]						
2001	1	19	200	10.5	$1.00	$200
2002	4	30	300	10.0	$1.00	$300
2003	1	122	1,250	10.2	$0.56	$700
2004 [e]						

[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, 1966-2004.

Year[a]	Number of Fishers Interviewed	Reported Harvest	Average Catch per Fisher
1966-1967	135	22,400	166
1967-1968	146	31,293	214
1968-1969	144	11,872	82
1970	168	13,928	83
1971	155	13,583	88
1972	79	3,832	49
1973	65	4,883	75
1974	58	1,062	18
1975	69	1,637	24
1976	57	966	17
1977	95	1,810	19
1978	95	1,810	19
1979	75	3,985	53
1980	74	3,117	42
1981	62	6,651	107
5/82-4/83 [b,c]	130	4,704	36
5/83-4/84 [b,c]	27	764	28
5/84-9/84 [b]	30	2,803	93
1985 [d]	2	60	30
1986 [b,d]	72	721	10
1987 [d]	46	276	6
1988 [d]			
1989 [d]			
1990 [d]			
1991	40	2,180	55
1992	43	2,821	66
1993	46	2,441	53
1994	171	3,181	19
1995 [e]	314	9,465	30
1996 [e]	389	6,953	18
1997 [e]	338	9,805	24.6
1998 [e]	435	5,350	13.6
1999 [e]	191	8,256	18.6
2000 [e]	237	7,446	16.6
2001 [e]	363	3,838	8.9
2002	101	3,882	38
2003	488	7,823 [f]	16.0
2004	2004 harvest not yet available		

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

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

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

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

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

[f] Includes 10 reported from commercial salmon fishery and used for subsistence.

Appendix Table F3. Peak annual aerial survey counts of sheefish in the Kobuk and Selawik Rivers, 1966-2004.

Year[a]	Kobuk River	Abundance Estimate for Kobuk River spawning area[e]	Selawik River	Total
1966	1,200		[c]	1,200
1967	1,025		[c]	1,025
1968	4,973		1,234	6,207
1969	3,654		[c]	3,654
1970	3,220		[c]	3,220
1971	8,166		1,196	9,362
1972	[b]		[c]	
1973	[c]		[c]	
1974	[b]		[c]	
1975	[b]		[c]	
1976	73		[c]	73
1977	[c]		[c]	
1978	2,824		[c]	2,824
1979	1,772		[c]	1,772
1980	250 [d]		[c]	250
1981	[b]		[c]	[b]
1982	1,009 [d]		[c]	1,009
1983	2,604		[c]	2,604
1984	[c]		[c]	
1985	[c]		[c]	
1986	[c]		[c]	
1987	[c]		[c]	
1988	[c]		[c]	
1989	[c]		[c]	
1990	[c]		[c]	
1991	17,335		[c]	17,335
1992	3,310		[c]	3,310
1993	[c]		[c]	
1994	[c]		[c]	
1995	1,840	32,273	[c]	1,840
1996	[c]	43,036	[c]	
1997	[c]	26,782	[c]	
1998	[c]		[c]	
1999	[c]		[c]	
2000	[c]		[c]	
2001	[c]		[c]	
2002	[c]		[c]	
2003	[c]		[c]	
2004	[c]		[c]	

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

[b] No fish reported.

[c] Not surveyed.

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

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

Appendix Table F4. Kotzebue District incidentally caught and sold Dolly Varden during the commercial salmon fishery, 1966-2004.

Year	Number of Fish Sold	Estimated Total Catch [g]	Pounds Sold	Average Weight [d]	Average Price
1966	3,325				0.55 [f]
1967	367		2,606	7.1	0.11
1968	3,181		21,949	6.9	0.14
1969	1,089 [a]				2.84 [f]
1970	2,095				
1971	3,828 [b]		23,353	6.1	0.16
1972	7,746		56,545	7.3	0.17
1973	640		4,608	7.2	0.16
1974	2,605 [c]		20,580	7.9	0.16
1975					
1976					
1977					
1978	1,229		9,094	7.4	0.15
1979	2,523		12,523	5.0	0.25
1980	3,049		17,015	5.6	0.20
1981	3 [e]		16	5.3	0.17
1982	3,447		23,648	6.9	0.20
1983	190 [e]	845	1,108	5.8	0.20
1984	347 [e]	1,090	2,104	6.1	0.25
1985	454	3,600	3,177	7.0	0.25
1986	5 [e]	2,373	34	6.8	0.20
1987	1,261	[h]	8,704	6.9	0.30
1988	752	[h]	4,967	6.6	0.35
1989	3,093	[h]	20,293	6.6	
1990	604	[h]	4,219	7.0	0.25
1991	6,136	[h]	40,747	6.6	0.18
1992	1,977	[h]	11,951	6.0	0.10
1993	76	[h]	540	7.1	0.10
1994	149	[h]	767	5.1	0.17
1995	2,090	[h]	13,195	6.3	0.20
1996	188	[h]	1,153	6.1	0.25
1997	3,320	[h]	23,203	7.0	0.20
1998	349	[h]	2,640	7.6	0.20
1999	1,502	[h]	11,352	7.6	0.20
2000	7	[h]	44	6.3	0.20
2001	0	[h]	0		
2002	0	30	0		
2003	20	176	160	8.0	0.50
2004	124	[h]	846	6.8	0.26

[a] Includes 269 taken by permit.

[b] Includes 179 taken by permit.

[c] Includes 234 taken during commercial sheefish fishery.

[d] Some data extrapolated from average reported weight.

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

[f] Price per fish.

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

[h] No estimate made of Dolly Varden caught but not sold.

Appendix Table F5. Subsistence harvests of Dolly Varden from the villages of Kivalina and Noatak, 1959-2004.

	Kivalina		Noatak
Year	Number	Pounds	Number [d]
1959 [a]	34,240	85,600	
1960 [a]	49,720	124,300	
1962			27,623
1963			4,130
1968 [e]	49,512	120,214	
1969	64,970	152,750	32,350
1970	33,820	79,420	3,700
1971	29,281	68,518	5,320
1972	48,807	114,637	1,492
1973 [b]			
1979 [c]	14,600		9,060
1980			7,220
1981	15,000-18,000		3,056
1982	18,438 [e]		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
2002 [g]			3,242
2003 [g]			5,670
2004	2004 data not available at this time		

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

[b] Storm and ice conditions prevented fall harvest.

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

[d] No data available on poundage.

[e] Harvest data from Stephen Braund and Associates.

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

[g] Based on ADFG, 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, 1968-2004.

Year [a]	Noatak River Spawner Survey [b]	Overwintering	
		Wulik River [e]	Kivalina River [e]
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	70,704	[f]
2000	[f]	[f]	[f]
2001	[f]	92,614	[f]
2002	[f]	44,257	[f]
2003	[f]	1,500 [g]	
2004		100,806	

[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.

[#] Spawning survey conducted on 8/20/03.

Appendix Table F7. Subsistence whitefish catch and effort in the Kotzebue District, 1970-2004.

Year[a]	Number of Fishers Interviewed	Number of Whitefish Harvested
1970		58,165
1971		36,012
1977		30,810
1978		77,474
1979	123	43,653
1980	67	49,106
1981	71	37,746
1982[b]		
1983	47	16,389
1984	79	28,614
1985[c]	46	5,229
1986[d]	72	11,854
1987[d]	46	20,020
1988[e]	38	14,000
1989[b]		
1990[b]		
1991[d]	63	16,015
1992[d]	66	17,485
1993[d]	70	19,060
1997	413[f]	84,851
1998	435[f]	39,754
1999	191[f]	56,326
2000	237[f]	70,097
2001	363[f]	30,976
2002	101[g]	25,607
2003	446	73,242
2004	2004 data not yet available	

[a] Whitefish harvest information was collected during chum salmon subsistence surveys and is considered a 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 is from Ambler, Kaiana, Kobuk, Noatak, Noorvik, and Shungnak.

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

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

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

Appendix G2. Alaska Department of Fish and Game and associated cooperative studies conducted within the Norton Sound, Port Clarence, and Kotzebue Districts, 2004.

HERRING

Herring Test Fishing

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

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

SALMON

Unalakleet Escapement Studies

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

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

North River Tower

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

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

Kwiniuk River Tower

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

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

(continued)

Niukluk River Tower

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

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

Eldorado River Fixed Weir

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

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

Nome River Fixed Weir

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

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

Snake River Fixed Weir

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

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

(continued)

Fish River Chum Salmon Radiotelemetry

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

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

Glacial Lake Salmon Counting Weir

a)Location: At outlet of Glacial Lake.

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

Pilgrim River Counting Weir

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

b)Description: Determine daily and seasonal timing and magnitude of the salmon escapements. Cooperative project operated by Kawerak Inc. with assistance from ADFG, BSFA, Norton Sound Initiative (NSI), and NSEDC.

(continued)

Northwest Salmon Biological / Rehabilitation Projects

1). Salmon Lake Limnology Project / Sockeye Salmon Restoration

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

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

2). Hobson Creek Incubation Project.

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

b)Description: Incubation facility for supplemental salmon production. Nome Fishermen's Association project. Study designed to prove the feasibility producing and marking salmon fry. Land leased from Sitnasuak Native Corporation. Pink salmon eggs were taken in 2004.

3). Safety Sound Chum Salmon Juvenile Ecology Project

a)Location: Safety Sound, throughout.

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

Kobuk River Test Fish Project

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

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

(continued)

Subsistence Salmon Fishing Surveys

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

b)Description: Determine subsistence utilization of salmon for formulating management procedures and goals. House-to-house surveys were conducted in Kotzebue District and surrounding villages by the Division of Subsistence. Subsistence salmon permits were issued in the Norton Sound and Port Clarence Districts by the Division of Commercial Fisheries. ADFG project.

CRAB

Nearshore Winter King Crab Study

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

b)Description: Document the abundance and distribution of red king crab in nearshore Nome waters. Tag all male new shell red king crab with carapace length $\leq$ 100 mm. ADFG project.

Norton Sound King Crab Trawl Survey (Conducted in 2002; next survey 2005)

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

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

Appendix G3. Norton Sound, Port Clarence, Kotzebue Sound processors, 2004.

Company	Address	Type of Processing	District
Aqua Tech	P.O. Box 10119 Anchorage, AK 99510	Fresh Crab	Norton Sound
Norton Sound Seafood	Box 323 Unalakleet, AK 99684	Frozen/Fresh Salmon Herring Roe on Kelp King Crab	Norton Sound
Bering Sea Fishermen's Assn.	705 Christiansen St. Anchorage, AK 99501	Headed and Gutted Salmon and Dolly Varden	Kotzebue Sound

Appendix G4.

NORTON SOUND 2004 SUBSISTENCE SALMON HARVEST SURVEY

Alaska Department of Fish and Game

Community ID#_____

Household ID#_____

Community: _____

Survey Date: _____

Interviewer: _____

Household Size: _____

(If new household) PO Box:_____

Household participation is voluntary. Individual household data will not be released without permission of household head.

1. Did your household fish for salmon for subsistence use this year? (Include fishing with a rod and reel) ☐ YES ☐ NO

2. Does your household usually subsistence fish for salmon? ☐ YES ☐ NO

FOR SALMON FISHING HOUSEHOLDS ONLY ("Yes" to #1)

3. Please estimate how many salmon your household caught for subsistence use this year, including with a rod and reel. It is important not to double count fish harvests. Report only your share of the catch if fishing with others. Include salmon you gave away, ate fresh, fed to dogs, lost to spoilage, or obtained from helping others process fish.

SPECIES	NUMBER OF SALMON YOUR HOUSEHOLD HARVESTED (BY GEAR TYPE)			Of your TOTAL HARVEST how many salmon were caught JUST for dog food? (Number of fish)
	SUBSISTENCE GILL NET or SEINE (Number of fish)	ROD & REEL (Number of fish)	KEPT FROM COMMERCIAL FISHING (Number of fish)	
CHUM SALMON Dog				
CHINOOK SALMON King				
PINK SALMON Humpy				
SOCKEYE SALMON Red				
COHO SALMON Silver				

4. How was subsistence chum salmon fishing for your household this year ?

☐ VERY GOOD ☐ AVERAGE ☐ POOR IF POOR, why?_____

5. Does anyone in your household trade or barter subsistence-caught fish with people in other households or communities?

☐ YES ☐ NO

6. Comments or Suggestions?

COMMUNITY ID# _____
HHID#_____

NOATAK RIVER AREA

2004 SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY

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

Community: _____ Household Head Name: _____

Survey Date: _____ ***Household Size** _____

Interviewer:_____ If new household, where were you living last year? _____

_____

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

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

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

FISHING HOUSEHOLDS ("Yes" to #1)

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

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

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

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

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

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

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

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

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

If Household Fished for Dog Food:

8. How many salmon did your household catch for dog food? (Do not include fish lost to spoilage and fed to dogs.)
CHUM_____ ("DOGS") CHINOOK_____ ("KINGS") PINK_____ ("HUMPIES") SOCKEYE _____ ("REDS") COHO_____ ("SILVERS") UNKNOWN SALMON_____

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

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

HHID#_____

NOATAK RIVER AREA

2004 SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY (CON'T)

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

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

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

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

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

(Go to #13)

COMMERCIAL FISHING

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

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

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

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

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

TROUT (CHAR) AND WHITEFISH FISHING

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

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

TROUT _____ WHITEFISH _____

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

THANK YOU FOR YOUR TIME AND FOR HELPING WITH THIS PROJECT.
A summary of this subsistence fishing survey will be sent to you next spring (April).

COMMUNITY ID#_____
HHID#_____

KOBUK RIVER AREA

2004 SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY

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

Community: _____
Survey Date: _____
Interviewer:_____

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

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

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

FISHING HOUSEHOLDS ("Yes" to #1)

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

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

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

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

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

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

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

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

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

If Household Fished for Dog Food:

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

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

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

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

HHID#_____

KOBUK RIVER AREA

2004 SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY (CON'T)

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

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

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

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

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

(Go to #13)

COMMERCIAL FISHING

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

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

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

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

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

SHEEFISH AND WHITEFISH FISHING

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

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

SHEEFISH _____ WHITEFISH _____

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

THANK YOU FOR YOUR TIME AND FOR HELPING WITH THIS PROJECT.
A summary of this subsistence fishing survey will be sent to you next spring (April).

RED KING CRAB

Emergency Order: 3-C-Z-01-04 Effective Date: June 15, 2004
EXPLANATION: This emergency order opens the commercial CDQ crab fishery in Norton Sound from 12:00 noon Tuesday, June 15 until 12:00 noon Monday, June 28.
JUSTIFICATION: By regulation, the Norton Sound CDQ crab fishery may begin at 12:00 noon, June 15, or no less than 72 hours after the commercial gillnet or beach seine herring fishery is closed, whichever is later. The guideline harvest level for the 2004 Norton Sound crab fishery is 353,000 pounds. By regulation, the CDQ fishery is allocated 7.5% of the summer season harvest. Therefore, the CDQ harvest quota is set at 26,500 pounds. Only fishers designated by the Norton Sound and Lower Yukon CDQ groups are allowed to participate in this portion of the king crab fishery. Fishers must have a CDQ fishing permit from Commercial Fisheries Entry Commission and register with Nome or Unalakleet ADF&G prior to fishing. Fishers will also be given pot tags at the time of registration. It is important for fishers to understand that they are operating under the authority of the CDQ permit holder. It is the individual CDQ group's decision on how the CDQ crab quota will be harvested. Commercial fishers are also reminded that subsistence pots must be removed from the water 14 days prior to deploying commercial pots.

Emergency Order: 3-C-Z-02-04 Effective Date: August 8, 2004
EXPLANATION: This emergency order closes the commercial open access king crab fishery in Norton Sound at 12:00 noon Sunday, August 8
JUSTIFICATION: Through August 5th approximately 276,000 pounds of king crab have been harvested in the Norton Sound Open Access fishery. The GHL for the 2004 summer open access fishery is 326,500 pounds of crab. There are 28 vessels registered and 182 deliveries have been made. It is expected that the GHL will be reached by 12:00 noon Sunday, August 8.

HERRING

Emergency Order: 3-H-Z-1-04 Effective Date: May 25, 2004
EXPLANATION: This emergency order opens the Norton Sound District to commercial gillnet bait herring fishing.
JUSTIFICATION: There has been no buyer interest in herring sac roe although there is over 5,000 tons on the quota. An aerial survey estimated 34,000 tons of herring in the district. Permit holders have asked for a bait fishery to allow herring to be harvested for the upcoming crab season. Some permit holders may attempt to sell the herring as a catcher-seller. Others plan to sell the herring to a local buyer who intends to hold it for the permit holders' use later in the season. As the likely harvest of herring will be a few hundred tons or less the fishery will be open continuously and permit holders can use their sac roe or bait herring permit cards. The emergency order expires when the regular herring bait season occurs in regulation.

KOTZEBUE SALMON

Emergency Order: 3-S-X-01-04 Effective Date: July 12, 2004
EXPLANATION: This emergency order opens commercial fishing in the Kotzebue District until September 1, 2004. Commercial permit holders can fish at any time a market is available for their catch.
JUSTIFICATION: One major commercial salmon buyer has expressed interest in purchasing Kotzebue chum salmon this season. However, the buyer has indicated that they intend to buy from a limited number of permit holders and will require a much higher quality of product from the sellers. The season normally opens on July 10 and by regulation closes after August 31. The buyer has notified the department that they would like to begin purchasing fish on July 12. The forecast was for a harvest of 25,000 to 50,000 chum salmon this year. One permit holder has expressed interest in being a catcher-seller this season, but would likely sell less than 200 chums. The historical harvest has been over 100,000 chum salmon most years. To provide maximum opportunity to those who will fish, the department is opening the commercial salmon season 24 hours a day until further notice and the season will close on September 1, 2004. Permit holders can choose when they want to fish according to market conditions. Having the fishery open 24 hours per day will allow the one buyer to determine the fishing schedule that will provide for maximum quality of salmon based on processing time and airline schedules. With a limited market and an expected low number of participating permit holders, achieving escapement goals are not expected to be a

problem. If escapement becomes a concern then a restricted fishing schedule will go into effect. Permit holders will have to make use of any salmon the buyer does not purchase. If any dumping of salmon occurs the department will close the fishery and meet with buyers and permit holders and design a schedule that is more efficient and to remind permit holders that the buyer is not required to buy any salmon not meeting quality standards.

NORTON SOUND SALMON

Emergency Order: 3-S-Z-01-04 Effective Date: June 15, 2004
EXPLANATION: This emergency order closes Subdistrict 1 of the Norton Sound District, from Topkok Head in the east to Cape Rodney in the west, to all subsistence salmon fishing in fresh and marine waters beginning Tuesday, June 15 until August 1, 2004, unless superceded by a following emergency order. All rivers that drain into Subdistrict 1 of the Norton Sound District and all marine waters are closed to the taking of salmon.
JUSTIFICATION: For over a decade the Nome Subdistrict has had weak chum salmon returns and once again, the subdistrict is being closed to protect chum salmon spawning stocks. The chum salmon stock of the Nome Subdistrict is judged insufficient to support the full subsistence needs of the residents. The Board of Fisheries has mandated that a harvestable surplus of less than 3,430 chum salmon be managed as a Tier II fishery. It is anticipated that there will be a harvestable surplus of approximately 1,500 chum salmon this season. Tier II fishing allows those residents who have been determined to be the longest users and the most dependent users of chum salmon to participate in a subsistence fishery. The other salmon species present in the Nome Subdistrict during July are not present in sufficient numbers to provide for subsistence needs without also harvesting chum salmon. Chinook and sockeye salmon are very limited in number and although desirable as food, have always been caught incidentally to the chum salmon. Even-numbered year pink salmon returns are typically very abundant, but are not expected to build appreciably until early July. At this time, the Tier I closure of these other salmon species is necessary for both conservation and to allow the orderly management of the Tier II fishery. By late July, coho salmon should arrive in the Nome Subdistrict and the Tier I closure will be lifted if the restrictions are of little benefit to protecting chum salmon.
The department staff has been issuing Tier II permits since earlier June, at the Nome Fish and Game office. There were 60 applicants for Tier II permits and initially 50 permits were planned to be issued. Of the 60 applications there were 2 applications submitted per household from 3 households. As each household receives only one permit there are 57 households that applied. Although the Tier II permit limit is 100 chum salmon, historically, the average Tier II permit holder harvests only slightly more than 30 chum salmon. Therefore, the department was planning to issue 50 permits for the estimated 1,500 chum salmon surplus. However, since 2001, at least 7 permit households have not fished each season. In the last three years the department would allow 10 additional applicants to get permits if some permit holders were not fishing. The department will now allow 57 permits to be issued. As the minimum not fishing has been 7 permits when there were 40 applicants allowed to fish the department is confident that approximately 50 Tier II permit holders or less will fish in 2004. A person from each household awarded a permit will be issued a permit form and will be given an explanation of the fishing limits and rules. Should the harvestable surplus exceed 3,430 chum salmon, the management of the fishery would be converted back to Tier I management rules.
The department staff will be flying frequent aerial surveys and boating some of the rivers to track the salmon migration's strength and progress. The weirs and towers on the Nome, Snake, and Eldorado Rivers, will also be used to track the various salmon migrations. If a stream appears to have adequate escapement, fishing closures will be lifted in that area; otherwise, the restrictions will remain in place until they no longer benefit chum salmon.

Emergency Order: 3-S-Z-02-04 Effective Date: June 15, 2004
EXPLANATION: This emergency order opens the marine waters east of Cape Nome for Subdistrict 1 of the Norton Sound District to Tier II chum salmon fishing beginning 6:00 p.m. Tuesday, June 15 until 6:00 p.m. Friday, June 18, 2004, and establishes the weekly Tier II marine water fishing periods each succeeding Tuesday at 6 p.m. until Friday 6 p.m. for a weekly fishing schedule of 72 hours unless superceded by a following emergency order. Only Tier II permit holders will be allowed to subsistence fish for salmon in the Nome Subdistrict.
JUSTIFICATION: For over a decade the Nome Subdistrict has had weak chum salmon returns and once again, the subdistrict is being closed to protect chum salmon spawning stocks. The chum salmon stock of the Nome Subdistrict

is judged insufficient to support the full subsistence needs of the residents. The Board of Fisheries has mandated that a harvestable surplus of less than 3,430 chum salmon be managed as a Tier II fishery. It is anticipated that there will be a harvestable surplus of approximately 1,500 chum salmon this season. Tier II fishing allows those residents who have been determined to be the longest users and the most dependent users of chum salmon to participate in a subsistence fishery. The other salmon species present in the Nome Subdistrict during July are not present in sufficient numbers to provide for subsistence needs without also harvesting chum salmon. Chinook and sockeye salmon are very limited in number and although desirable as food, have always been caught incidentally to the chum salmon. Even-numbered year pink salmon returns are typically very abundant, but are not expected to build appreciably until July 4. At this time, the Tier I closure of these other salmon species is necessary for both conservation and to allow the orderly management of the Tier II fishery. In early July Tier I subsistence fishing with pink salmon gear may be opened and by late July, coho salmon should arrive in the Nome Subdistrict and Tier I subsistence fishing for other salmon species may be reopened.

The department staff has been issuing Tier II permits since earlier June, at the Nome Fish and Game office. There were 60 applicants for Tier II permits and initially 50 permits were planned to be issued. Of the 60 applications there were 2 applications submitted per household from 3 households. As each household receives only one permit there are 57 households that applied. Although the Tier II permit limit is 100 chum salmon, historically, the average Tier II permit holder harvests only slightly more than 30 chum salmon. Therefore, the department was planning to issue 50 permits for the estimated 1,500 chum salmon surplus. However, since 2001, at least 7 permit households have not fished each season. In the last three years the department would allow 10 additional applicants to get permits if some permit holders were not fishing. The department will now allow 57 permits to be issued. As the minimum not fishing has been 7 permits when there were 40 applicants allowed to fish the department is confident that approximately 50 Tier II permit holders or less will fish in 2004. A person from each household awarded a permit will be issued a permit form and will be given an explanation of the fishing limits and rules. Should the harvestable surplus exceed 3,430 chum salmon, the management of the fishery would be converted back to Tier I management rules.

To provide subsistence opportunity for Tier II permits holders fishing will be open weekly for 72 hours from 6:00 p.m. Tuesday until 6:00 p.m. Friday, in the marine waters from Cape Nome to Topkok Head for June and July, 2004. Harvest limits are listed on all permits as per 5 AAC 01.015 Subsistence permits and reports.

The department staff will be flying frequent aerial surveys and boating some of the rivers to track the salmon migration's strength and progress. The weirs and towers on the Nome, Snake, and Eldorado Rivers, will also be used to track the various salmon migrations. If a stream appears that it will reach adequate escapement, fishing closures will be lifted in that area to first allow Tier II permit holders to fish and if adequate escapement is nearly assured then Tier I fishing will be allowed; otherwise, the restrictions will remain in place until they no longer benefit chum salmon.

Emergency Order: 3-S-Z-03-04 Effective Date: June 22, 2004

EXPLANATION: This emergency order opens the subsistence fresh water areas of the Nome Subdistrict from the Nome River east and the Sinuk River to Tier I subsistence fishing with rod and reel. No chum salmon can be retained and any chum salmon incidentally hooked must be kept in the water and released immediately. The areas open to fishing include the Nome, Eldorado, Flambeau, Bonanza, Solomon and Sinuk Rivers and Safety Sound and Bonanza Channel. The Snake, Cripple and Penny Rivers remain closed to all salmon fishing. The Tier I fishery is to allow permit holders the opportunity to harvest pink salmon that are now arriving in the Subdistrict.

JUSTIFICATION: In the Nome Subdistrict pink salmon are starting to appear in the rivers earlier than expected. Pink salmon have been observed as far west as Nome River. The pink salmon return appears to be at least a week early and may be an indication of a strong run. Recently several hundred pink salmon pink salmon have been moving in and out of the Nome River with the tide as far upriver as the Council Highway Bridge. The department is expecting a good run of pink salmon in 2004, but has concerns about the poor returns of pink salmon to the Snake, Cripple and Penny Rivers in recent years and those rivers will remain closed at this time. As the Nome Subdistrict is in Tier II status for chum salmon any chum salmon incidentally hooked must be immediately released without leaving the water. Although the department is forecasting a good pink salmon run in 2004, sport fishing for salmon in the Nome Subdistrict remains closed until more pink salmon enter the rivers. The rod and reel subsistence opening is to provide opportunity for residents to harvest pink salmon early in the season when drying conditions are

best. Net fishing remains closed, except for the Tier II period in the marine waters east of Cape Nome, to prevent the harvest of chum salmon.

Emergency Order: 3-S-Z-04-04 Effective Date: June 28, 2004
EXPLANATION: This emergency order opens the subsistence fresh water areas of the Nome Subdistrict west of the Safety Sound bridge and the Eldorado, Flambeau, and Sinuk Rivers to Tier II set gillnet subsistence fishing for two 48-hour periods from 6:00 p.m. Monday, June 28, 2004 until 6:00 p.m. Wednesday June 30, 2004 and from 6:00 p.m. Thursday, July 1, 2004 until 6:00 p.m. Saturday, July 3, 2004. Only Tier II permit holders will be allowed to subsistence fish with set gillnets for salmon in the fresh waters west of the Safety Sound bridge and the Eldorado, Flambeau and Sinuk Rivers. Tier II permit holders may use rod and reel to retain chum salmon also.
JUSTIFICATION: Aerial surveys of the Nome Subdistrict over the weekend showed nearly 9,000 pink salmon in the mouth of the Sinuk River, and an estimated two hundred chum salmon in the first two miles of the river. A couple hundred chum salmon were observed in the Eldorado and Flambeau Rivers. The department is opening the Eldorado, Flambeau and Sinuk Rivers to Tier II chum salmon permit holders to provide opportunity to harvest chum salmon during the usual better fish drying weather of early summer. The department forecasted a surplus of chum salmon for the Eldorado, Flambeau, and Sinuk Rivers, but if chum salmon counts start to fall off sooner than expected then there will be a delay in any further fishing periods. Based on the preseason forecast and the appearance of chum salmon in the rivers as expected this subsistence opening should not jeopardize escapement.

Emergency Order: 3-S-Z-05-04 Effective Date: June 28, 2004
EXPLANATION: This emergency order opens the marine waters from 500 yards east of the mouth of the Sinuk River to 500 yards west of the mouth of the Sinuk River beginning 6:00 p.m. Tuesday, June 29 until 6:00 p.m. Friday, July 2, 2004. Gillnets can be no longer than 300 feet and must be attached to shore in the Sinuk River marine water area. The above mentioned Sinuk River area is now included in the weekly Tier II marine water fishing periods each succeeding Tuesday at 6 p.m. until Friday 6 p.m. for a weekly fishing schedule of 72 hours unless superceded by a following emergency order. Only Tier II permit holders will be allowed to subsistence fish for salmon in the Nome Subdistrict marine waters.
JUSTIFICATION: There have been two Tier II periods of 72 hours each in the marine waters east of Cape Nome since mid-June. Previously Tier I subsistence salmon fishing was open 7 days a week. Salmon are beginning to migrate upstream in the Nome Subdistrict rivers earlier than in past years. The preseason forecast was for a surplus of 1,500 chum salmon in the Nome Subdistrict with the Eldorado, Flambeau and Sinuk Rivers expected to make the escapement goals. An aerial survey on June 26, observed approximately 9,000 pink salmon and 200 chum salmon from the mouth to two miles upstream. The BLM weir at Glacial Lake a tributary to Sinuk River has passed 321 sockeye and sockeye passage is the second highest on record for this date. The Sinuk River is the western most river in the Nome Subdistrict affected by the Tier II restrictions and little fishing effort usually occurs there as the subsistence fishing area is difficult to access. The subsistence area is from the mouth of the river to two miles upstream of the mouth and there is no road access. Based on the preseason forecast and the little fishing effort the marine areas adjacent to the Sinuk River the area can be opened to subsistence fishing and should not jeopardize escapement.

Emergency Order: 3-S-Z-06-04 Effective Date: July 1, 2004
EXPLANATION: This emergency order opens the subsistence fresh water areas in the Snake, Cripple, and Penny Rivers to Tier I subsistence fishing with rod and reel. No chum salmon can be retained and any chum salmon incidentally hooked must be kept in the water and released immediately. The Tier I fishery is to allow permit holders the opportunity to harvest pink salmon that are now arriving in these three rivers that had been previous closed to salmon fishing.
JUSTIFICATION: In the Nome Subdistrict pink salmon have been appearing in large numbers in the rivers. The Snake, Cripple and Penny Rivers had been lagging in pink salmon entering the river. An aerial survey on June 30 observed approximately 500 pink salmon in the Snake River and 1,000 pink salmon in the Penny River. The Cripple River had an estimated 15,000 pink salmon in the lower part of the river. Rivers to the east and west of the Snake, Penny and Cripple have pink salmon entering in the tens of thousands and have been open to pink salmon fishing for

a week. As pink salmon are starting to appear in the Snake, Cripple and Penny Rivers, rod and reel fishing will be open to provide for subsistence fishing opportunity. As the Nome Subdistrict is in Tier II status for chum salmon any chum salmon incidentally hooked must be immediately released without leaving the water. Net fishing remains closed, except for the Tier II periods in designated areas of the Nome Subdistrict, to prevent the harvest of chum salmon.

Emergency Order: 3-S-Z-07-04 Effective Date: July 1, 2004
EXPLANATION: This emergency order opens the marine waters west of Cape Nome for Subdistrict 1 of the Norton Sound District to Tier II chum salmon fishing beginning 6:00 p.m. Thursday, July 1 until 6:00 p.m.

Saturday, July 3, 2004. Tier II permit holders will be allowed to subsistence fish for salmon in the marine waters of the Nome Subdistrict.
JUSTIFICATION: Tier II fishing periods have been occurring in the marine waters east of Cape Nome on 3 day per week schedule. The periods go from 6 p.m. Tuesday until 6 p.m. Friday. Checking with subsistence fishers on Wednesday evening, June 30, they reported large catches of pink salmon and good catches of chum salmon. Aerial surveys of Nome Subdistrict showed most of rivers had chum salmon and a tremendous amount of pink salmon in the rivers for this early in the season.
The escapement projects have passed a higher than average number of chum salmon for June compared to other years. The Nome River chum count is the highest on record for June and the Snake and Eldorado River chum counts are the second and third highest. The aerial survey of the Sinuk River showed 40,000 salmon and most were believed to be pinks, but the Glacial Lake weir has already passed over 3,500 sockeye salmon which is more than any other year. The chum run midpoint is usually in mid-July and having an early season opening should allow for some harvest for Tier II permit holders without jeopardizing escapement. The early season harvest will allow permit holders to harvest chum salmon during the best drying weather and still provide the department an opportunity to close the chum fishery during the peak of the run if more chum salmon escapement is needed.
To provide subsistence opportunity for Tier II permits holders fishing will be open for 48 hours from 6:00 p.m. Thursday, July 1 until 6:00 p.m. Saturday, July 3 in the marine waters west of Cape Nome. Harvest limits are listed on all permits as per 5 AAC 01.015 Subsistence permits and reports.
The department staff will be flying frequent aerial surveys and boating some of the rivers to track the salmon migration's strength and progress. The weirs and towers on the Nome, Snake, and Eldorado Rivers, will also be used to track the various salmon migrations. If a escapement at the weirs show a river on target to reach the goal then Tier II fishing will be allowed and if escapement is virtually assured then Tier I fishing periods will be allowed as long as opportunity has been provided for Tier II permit holders; otherwise, the fishing restrictions will remain in place until they no longer benefit chum salmon.

Emergency Order: 3-S-Z-08-04 Effective Date: July 1, 2004
EXPLANATION: This emergency order opens previous closed subsistence fresh water areas of the Nome Subdistrict east of Cape Nome to Tier II set gillnet subsistence fishing for one 48-hour period from 6:00 p.m. Thursday, July 1, 2004 until 6:00 p.m. Saturday, July 3, 2004. All subsistence fresh water areas east of Cape Nome will now be open for one 48-hour fishing period. Only Tier II permit holders will be allowed to subsistence fish with set gillnets for salmon in the fresh waters east of Cape Nome. Tier II permit holders may use rod and reel to retain chum salmon also.
JUSTIFICATION: Aerial surveyors on June 30 observed thousands of pink salmon moving into Nome Subdistrict rivers. The survey of Flambeau River estimated 1,200 chum salmon. The count at Eldorado River through June 30 is the third highest out of eight years for this date. Surveys of the Bonanza Channel, Bonanza River and the Solomon River showed thousands of salmon moving into the rivers. Most were pink salmon, but some chum were seen in the pink salmon schools. With the early chum salmon passage at the Eldorado River weir and the chum salmon strength noted at the Flambeau and salmon entering the other rivers the department will open the remainder of the rivers east of Cape Nome to a 48-hour Tier II fishing period. The chum run midpoint is usually in mid-July and having an early season opening should allow for some harvest for Tier II permit holders without jeopardizing escapement. The early season harvest will allow permit holders to harvest chum salmon during the best drying weather and still provide the

department an opportunity to close the chum fishery during the peak of the run if more chum salmon escapement is needed.

Emergency Order: 3-S-Z-09-04 Effective Date: July 1, 2004
EXPLANATION: This emergency order opens the Nome River to two 24-hour beach seine periods for pink salmon from 6:00 p.m. Thursday, July 1, 2004 until 6:00 p.m. Friday, July 2, 2004, and from 6:00 p.m. Saturday, July 3, 2004 until 6:00 p.m. Sunday, July 4, 2004.
JUSTIFICATION: Aerial surveyors on June 30 estimated 40,000 pink salmon in the Nome River. Counts at the Nome River weir through June 30 are over 33,000 pink salmon. The pink salmon goal of 13,000 pink salmon has been met and having beach seine periods will provide an opportunity to harvest pink salmon while still being able to protect chum salmon. All chum salmon must be released from the beach seine.

Emergency Order: 3-S-Z-10-04 Effective Date: July 2, 2004
EXPLANATION: This emergency order opens the Moses Point Subdistrict to one 24-hour commercial gillnet period from 6:00 p.m. Friday, July 2, 2004 until 6:00 p.m. Saturday, July 3, 2004.
JUSTIFICATION: At the Kwiniuk River tower, in the Moses Point Subdistrict, 264 king salmon have passed the tower. The escapement goal range is 300 to 550 king salmon. Aerial surveys of the nearby Tubutulik River show greater numbers of king salmon than in the Kwiniuk River. Subsistence fishers have been fishing for over a month and have reported good catches of king salmon. Having a commercial fishing period will not jeopardize reaching the escapement goal. The normal weekly fishing period closes at 6 p.m. Friday, but a buyer was unavailable earlier in the week so the department is opening the commercial fishing on the weekend as a buyer is now available.

Emergency Order: 3-S-Z-11-04 Effective Date: July 3, 2004
EXPLANATION: This emergency order opens the marine waters of for Subdistrict 1 of the Norton Sound District to Tier I pink salmon fishing with gillnet mesh restrictions of 4.5 inches or less of stretch measure beginning 6:00 p.m. Saturday, July 3 until 6:00 p.m. Monday, July 5, 2004. Any live chum salmon captured in the net must be returned to water, except Tier II permit holders may retain chum salmon if they have not yet reached the marine water limit of 50 chum salmon for the season.
JUSTIFICATION: Aerial surveyors on June 30 estimated 40,000 pink salmon in the Nome River and nearly 40,000 pink salmon in the Sinuk River. Counts at the Nome River weir through June 30 are over 33,000 pink salmon. The pink salmon goal of 13,000 pink salmon has been met at Nome River and pink salmon have been observed in all rivers of the Nome Subdistrict. Having a gillnet opening with restricted mesh size of four and one-half each will allow fishers to target pink salmon while still being able to protect chum salmon. Any live chum in the net must be released unless the subsistence fisher has a Tier II permit and then the chum salmon can be kept if the permit has not reached the marine limit of 50 chum salmon.

Emergency Order: 3-S-Z-12-04 Effective Date: July 5, 2004
EXPLANATION: This emergency order opens the fresh water areas of the Nome Subdistrict east of Cape Nome and the Sinuk River to Tier II set gillnet subsistence fishing for one 48-hour period from 6:00 p.m. Monday, July 5, 2004 until 6:00 p.m. Wednesday, July 7, 2004. Only Tier II permit holders will be allowed to subsistence fish with set gillnets for salmon in the fresh waters east of Cape Nome and in the Sinuk River. Tier II permit holders may use rod and reel to retain chum salmon also.
JUSTIFICATION: Aerial surveyors on June 30 observed thousands of pink salmon moving into Nome Subdistrict rivers. The survey of Flambeau River estimated 1,200 chum salmon on the same date. The count at Eldorado River through July 3 is 859 chum salmon and with normal run timing the Eldorado River would just fall short of the low end of the escapement goal. By July 3 the Eldorado River usually has reached the 15% point of the run. If counts do not improve at the Eldorado River then this will likely be the last fresh water period for chum salmon. The chum run midpoint is usually in mid-July and having an early July opening should allow for some harvest for Tier II permit holders without jeopardizing escapement. The early season harvest will allow permit holders to harvest chum salmon during the best drying weather and still provide the department an opportunity to close the chum fishery during the peak of the run if more chum salmon escapement is needed. The Bonanza and Solomon Rivers have tens of thousands of pink salmon moving upstream and observing chum salmon is difficult. The seasonal limit of chum salmon on the Bonanza and Solomon Rivers is 20 chums each versus the 50 chum limit of the Eldorado. At this time the department is using the Eldorado River weir as an index of other rivers east of Cape Nome along with the aerial

survey of the Flambeau River where fewer pink salmon enable chum to be seen and fishing should not jeopardize chum salmon escapement in the Bonanza and Solomon Rivers. The Nome River and Snake River will remain closed to chum salmon fishing. The Snake River chum run is starting very slowing with only 16 chum salmon past the weir through July 3. Aerial surveys have shown a couple hundred chum in the river. The Nome River has a count of 458 chum salmon and this is the best count for this date in years. However, the last time the Nome River reached the minimum escapement goal was in 2000 and conservative action is being taken on this river and the Nome River will remain closed until more chum salmon have moved upstream. Surveys of the Sinuk River have also observed tens of thousands of pink salmon and hundreds of sockeye salmon. The Glacial Lake weir has passed nearly 5,000 sockeye salmon which is double the previous best year in the five years of the project. Although this Tier II opening is providing opportunity to catch chum salmon there will likely be few caught with gillnets because of the amount of pink and sockeye salmon in the river. A beach seine period is occurring concurrently with the Tier II chum salmon gillnet period in the same rivers and Tier II permit holders can harvest chum salmon from the beach seines. Tier II permit holders can also retain chum salmon by using rod and reel gear if they choose to in all rivers that are open.

Emergency Order: 3-S-Z-13-04 Effective Date: July 5, 2004
EXPLANATION: This emergency order opens the fresh water areas of the Nome Subdistrict east of Cape Nome and the Nome and Sinuk Rivers to Tier I beach seining for pink salmon for one 48-hour period from 6:00 p.m. Monday, July 5, 2004 until 6:00 p.m. Wednesday, July 7, 2004. Chum salmon must be immediately returned to the water, except Tier II permit holders can keep chum salmon if the permit holder has not reached the season limit in any river, except the Nome River. All permit holders whether Tier I or II must return chum salmon immediately to the water in the Nome River. Tier II permit holders may use rod and reel to retain chum salmon also.
JUSTIFICATION: Aerial surveyors on June 30 observed thousands of pink salmon moving into Nome Subdistrict rivers. A survey on July 3 observed tens of thousands of pink salmon in most of the Nome Subdistrict rivers. Through July 3 the escapement count at Nome River was 80,000 pink salmon. Surveys of the Sinuk, Solomon and Bonanza Rivers have also observed tens of thousands of pink salmon. A Tier II set gillnet period is occurring concurrently with the beach seine period in the same rivers, except for the Nome River. Tier II permit holders can harvest chum salmon from the beach seines, except for the Nome River. Tier II permit holders can also retain chum salmon by using rod and reel gear if they choose to in all rivers that are open, except for the Nome River. Tier II permit holders must stay within the season limit listed on the permit for chum salmon.

Emergency Order: 3-S-Z-14-04 Effective Date: July 8, 2004
EXPLANATION: This emergency order opens the fresh water areas of the Nome Subdistrict east of Cape Nome and the Nome and Sinuk Rivers to Tier I beach seining for pink salmon for the next two weeks to a fresh water schedule of two 48-hour periods per week from 6:00 p.m. Monday until 6:00 p.m. Wednesday and from 6:00 p.m. Thursday until 6:00 p.m. Saturday. Chum salmon must be immediately returned to the water.
JUSTIFICATION: Aerial surveyors on June 30 observed thousands of pink salmon moving into Nome Subdistrict rivers. A survey on July 3 and 5 observed tens of thousands of pink salmon in most of the Nome Subdistrict rivers. Through July 6 the escapement count at Nome River was 1200,000 pink salmon. Surveys of the Sinuk, Solomon and Bonanza Rivers have also observed tens of thousands of pink salmon. To protect chum salmon none can be retained.

Emergency Order: 3-S-Z-15-04 Effective Date: July 10, 2004
EXPLANATION: This emergency order closes the Unalakleet River or its tributaries to salmon gillnet fishing. Beach seines may be used to capture other salmon, but chinook and chum salmon captured must be immediately returned to the water.
JUSTIFICATION: The chinook salmon run to the Unalakleet Subdistrict has been poor so far this season. Subsistence fishers have reported catches below average in the subdistrict. Over the last seven days weather has been considered favorable for chinook salmon movement. During this time subsistence fishers in the lower Unalakleet River have reported low chinook salmon catches. The department test net has not seen a bump of chinook salmon.
The Unalakleet River test net has the second lowest catch to date with 21 chinook salmon. The previous 10-year average is 65 for this date. In 2000 through 2003 the catch at the test net ranged from 24 to 54 chinook salmon by July 8. A cooperative chum salmon radio telemetry tagging project in the lower Unalakleet River

caught 35 chinook salmon indecently from June 23 to June 26. Since that time the project has only caught 10 chinook salmon with a similar effort. There has not been a push of chinook salmon into the lower river.

The Unalakleet IRA counting tower on the North River has an average chinook salmon count to date with 560 compared to previous years. However, on average the seventy fifth percentile of the chinook salmon run is passed with in 13 days of the first daily tower count of over 50 chinook salmon. The maximum time to reach the seventy fifth percentile of the chinook salmon run is 17 days after the first daily tower count of over 50 chinook salmon. The first chinook count over 50 was on June 27. Therefore, it is likely that chinook salmon passage is close to or passed the seventy fifth percentile of the chinook salmon run. The escapement goal range at North River is 1,200 to 2,400 chinook salmon. It appears that the escapement goal for chinook salmon may not be reached in 2004.

Subsistence nets have been catching pink salmon in good numbers and both the test net and tower have strong catches and record counts of pink salmon when compared against the historical data for an even-numbered year pink salmon run.

Because of concerns with the low numbers of returning chinook salmon, and concerns about meeting the escapement goals for chinook salmon, the department will close the subsistence salmon gillnet fishery in the Unalakleet River drainage effective Saturday, July 10. All gillnets must be out of the Unalakleet River and the tributaries after Saturday at 8:00 pm. Because of the strong pink salmon run the Unalakleet River will remain open for subsistence beach seining for pink salmon. Any chinook salmon captured in beach seines must be immediately returned to the water.

This protective action is being taken to protect chinook salmon stocks while still allowing subsistence fishers the opportunity to harvest pink salmon in beach seines. The department will continue to assess the salmon run and if the chinook salmon run appear to be nearing escapement goals then gillnet restrictions will be relaxed.

Emergency Order: 3-S-Z-16-04 Effective Date: July 12, 2004

EXPLANATION: This emergency order includes the Snake River in the fresh water subsistence areas of the Nome Subdistrict that are open and allows chum salmon to be retained in select areas by Tier II permit holders. Tier I permit holders must not retain chum salmon. Chum salmon may be retained by Tier II permit holders in all waters except for the Eldorado and Nome Rivers.

JUSTIFICATION: Aerial surveyors on June 30 observed thousands of pink salmon moving into Nome Subdistrict rivers. A survey on July 3 and 5 observed tens of thousands of pink salmon in most of the Nome Subdistrict rivers. Thousands of pink salmon are now in all Nome Subdistrict rivers. Chum salmon are moving into the rivers in larger numbers in recent days. Tier II permit holders will be allowed to retain chum salmon in all fresh water subsistence areas, except for the Nome and Eldorado Rivers. Also, the Penny and Cripple Rivers are closed in regulation to the taking of chum salmon. Tier I permit holders must return all chum salmon. The historical midpoint at the Eldorado River weir for chum salmon is July 14 and the normal run timing projections show that river will not make escapement and therefore no retention of chum salmon will be allowed. On the Nome River the historical midpoint of chum salmon passage at the weir is July 20. Although early chum run projections show the low end of the escapement goal will be met the Nome River has not made the escapement goal since 2000 and conservative action will be taken to chum salmon fishing until closer to the midpoint and escapement will likely be met.

Emergency Order: 3-S-Z-17-04 Effective Date: July 13, 2004

EXPLANATION: This emergency order opens Subdistrict 1 of the Norton Sound District to subsistence salmon gillnet fishing marine waters beginning 6 p.m. Tuesday, July 13 until 6 p.m. Friday July 16, 2004, and from 6 p.m. Tuesday, July 20 until 6 p.m. Friday, July 23.

JUSTIFICATION: One day passage records for pink salmon were broken over the past several days at Nome River weir. Pink salmon have been pouring into other rivers in Norton Sound and season records will be set at several projects. Chum salmon are continuing to move into Subdistrict 1 (Nome Subdistrict) rivers and most rivers are on track to meet escapement goals. Tier II permit holders have been able to fish in marine waters east of Cape Nome on the 72 hour weekly schedule for one month and have had one fishing period in the marine waters west of Cape Nome. The next two weeks will allow all permit holders, both Tier I and Tier II to fish in marine and have their choice of mesh size. With record numbers of pink salmon still moving into the Nome Subdistrict permit holders will likely catch few chums in their nets and not jeopardize escapement in Nome Subdistrict Rivers. The pink salmon limit has been waived.

Emergency Order: 3-S-Z-18-04 Effective Date: July 15, 2004
EXPLANATION: This emergency order opens the fresh water areas of the Nome Subdistrict east of Cape Nome, except for the Eldorado River and opens the Snake River and the Sinuk River to Tier II set gillnet subsistence fishing for one 48-hour period from 6:00 p.m. Thursday, July 15, 2004 until 6:00 p.m. Saturday, July 17, 2004. Only Tier II permit holders will be allowed to subsistence fish with set gillnets for chum salmon. Tier II permit holders may use rod and reel to retain chum salmon in the same waters.
JUSTIFICATION: Weir counts and aerial surveys indicate that most rivers in the Nome Subdistrict will reach the escapement goal. There is concern with the Eldorado River reaching the chum salmon escapement goal of 6,000 to 9,200 chum salmon. Historically the midpoint of the chum salmon run past the Eldorado River weir is July 14 and through July 13 the count is 2,682 chum salmon. To protect chum salmon escapement the Eldorado River will remain closed. The Nome River is on track to reach the escapement goal range of 2,900 to 4,300 chum salmon. The Nome River has a count of 1,510 chum salmon and this is the best count for this date in years. Historically the midpoint of the chum run at the Nome weir is July 20. However, the last time the Nome River reached the minimum escapement goal was in 2000 and conservative action is being taken on this river and the Nome River will remain closed until more chum salmon have moved upstream. Surveys of the Sinuk River have also observed tens of thousands of pink salmon and hundreds of sockeye salmon. The Glacial Lake weir has passed nearly 7,500 sockeye salmon which is triple the previous best year in the five years of the project. Although this Tier II opening is providing opportunity to catch chum salmon there will likely be few caught with gillnets because of the amount of pink and sockeye salmon in the river. A beach seine period is occurring concurrently with the Tier II chum salmon gillnet period in the same rivers and Tier II permit holders can harvest chum salmon from the beach seines. Tier II permit holders can also retain chum salmon by using rod and reel gear if they choose to in all rivers that are open.

Emergency Order: 3-S-Z-19-04 Effective Date: July 17, 2004
EXPLANATION: This emergency order allows beach seining in all fresh water subsistence areas of the Nome Subdistrict and allows chum salmon to be retained in select areas by Tier II permit holders, except in the Nome, Eldorado, Penny and Cripple Rivers. Tier I permit holders must not retain chum salmon.
JUSTIFICATION: Aerial surveys show almost all Nome Subdistrict rivers full of pink salmon. A new one day record of 106,000 pinks passed the Nome weir on July 15 and the cumulative count is now 660,000 pinks breaking the previous record of 360,000 pinks. Aerial surveys show hundreds of thousands of pinks in a number of Nome Subdistrict streams. The department is opening all freshwater areas to beach seining for one week and encouraging subsistence permit holders to take their subsistence needs of pink salmon for the season. The last week of July the department will switch to coho management and return to the two 48-hour subsistence fishing periods a week in the Nome Subdistrict. The emergency order allowing beach seining will expire the last week of July and beach seines will no longer be legal gear in the Nome Subdistrict during coho season.

Emergency Order: 3-S-Z-20-04 Effective Date: July 20, 2004
EXPLANATION: This emergency order allows Tier II permit holders to retain chum salmon when beach seining downstream of the VOR site on the Nome River. The Nome River was previously closed to the retention of chum salmon. This emergency order also closes the Solomon River to the retention of chum salmon. Tier II permit holders may retain chum salmon in select subsistence areas, except in the Solomon, Eldorado, Penny and Cripple Rivers. Tier I permit holders must not retain chum salmon.
JUSTIFICATION: Counts at the Nome River weir are 2,400 chum salmon. In years when the escapement goal range of 2,900 to 4,300 chum salmon was reached at least 2,000 chum salmon had been counted by July 18. Projections show the final chum salmon count should likely be in the middle of the escapement goal range. To protect chum salmon that have passed upstream through the weir the area allowed for Tier II permit holders to retain chum salmon will be from 200 yards upstream of the mouth to the VOR site approximately two miles upstream of the mouth. Allowing Tier II permit holders to harvest chum salmon during beach seining or rod and reel fishing should not jeopardize reaching the escapement goal range.

An aerial survey of the Solomon River on July 15 estimated there were 58,000 pink salmon and 100 chum salmon in the lower portion of the river downstream of the Big Hurrah creek to the mouth of the river. A foot survey on July 18 estimated 52,725 pink salmon and 217 chum salmon in the Solomon River from the Big Hurrah creek to Solomon village. As the escapement goal range is 1,100 to 1,600 chum salmon on the Solomon River the river will

now be closed to the retention of chum salmon. Beach seining and rod and reel fishing for other salmon species is still allowed on the Solomon River, but all chum salmon must be released immediately in the water.

Emergency Order: 3-S-Z-21-04 Effective Date: July 26, 2004
EXPLANATION: This emergency order opens the Unalakleet and Shaktoolik Subdistricts to commercial salmon fishing for two 48-hour periods a week. Beginning 6 p.m. Monday, July 26 commercial salmon fishing will be open from 6 p.m. Monday until 6 p.m. Wednesday and from 6 p.m. Thursday until 6 p.m. Saturday. Only nets with a mesh size no larger than 6 inches will be allowed.
JUSTIFICATION: Based on the 2000 parent-year escapement, the 2004 coho salmon run is expected to be above average in the Unalakleet and Shaktoolik Subdistricts. The Norton Sound Salmon Management Plan considers the coho salmon season to start July 26th and outlines to begin commercial fishing with standard periods if there are no escapement concerns.
Through July 22 the Unalakleet test net has a CPUE of 21 coho salmon and the North Tower has a cumulative coho salmon count of 1074 both are records for this date. While it is early in the run, the run appears to be strong and following early run timing to the parent year of 2000 and its parent year of 1996. The average Unalakleet test net CPUE is 2 and the previous high CPUE was 9 for this date. The average North tower cumulative count is 150 and with previous high cumulative counts of 316 and 681 for this date.
The last two weeks weather was hot and river water levels are low. These conditions are not considered good for coho salmon passage so this is another indication of an early and strong run. This week is usually the start of the coho salmon run into the Unalakleet and Shaktoolik Subdistricts and allowing the normal commercial fishing schedule should not jeopardize subsistence fishing or coho salmon escapement needs.

Emergency Order: 3-S-Z-22-04 Effective Date: July 26, 2004
EXPLANATION: This emergency order reopens Subdistrict 1 of the Norton Sound District, from Topkok Head in the east to Cape Rodney in the west, to the regular subsistence salmon set gillnet fishing schedule in fresh and marine waters. The marine water schedule is 6 p.m. Monday until 6 p.m. Saturday and the fresh water schedule is 6 p.m. Monday until 6 p.m. Wednesday and from 6 p.m. Thursday until 6 p.m. Saturday. To protect spawning chum salmon the upstream boundary of the Nome River is now the VOR site.
JUSTIFICATION: Coho salmon have begun to move past the escapement projects in the Nome Subdistrict. The subsistence fishing schedule in the Nome Subdistrict returns to the regular schedule for set net gillnet fishing to provide opportunity for subsistence permit holders to harvest coho salmon and pink salmon run. Early coho counts from projects east of the Nome Subdistrict show a strong run of coho salmon. The Nome Subdistrict is also showing strong early counts of coho salmon. The chum salmon run is now nearly complete and returning to the regular subsistence fishing schedule should not jeopardize escapement. This emergency order restricts the fishing area of the Nome River from its terminus upstream for a distance of 200 yards and upstream from an ADF&G regulatory marker located near the VOR site to protect chum salmon. Any chum salmon caught by rod and reel fishing upstream of the VOR site must be immediately released. The Nome River has had poor runs of chum salmon the last several years and this year's chum escapement is the best since 2000. The minimum escapement goal of 2,900 chum salmon past the Nome River weir has been met and the current escapement count is 3,100 chums. Restricting the subsistence fishing area from the normal upstream boundary at Osborn Creek will prevent the harvest of spawning chum salmon.

Emergency Order: 3-S-Z-23-04 Effective Date: August 8, 2004
EXPLANATION: This emergency order changes the starting time of the two weekly 48-hour commercial salmon fishing periods in the Unalakleet and Shaktoolik Subdistricts. Beginning 6 p.m. Sunday, August 8 commercial salmon fishing will be open from 6 p.m. Sunday until 6 p.m. Tuesday and from 6 p.m. Wednesday until 6 p.m. Friday. Only nets with a mesh size no larger than 6 inches will be allowed.
JUSTIFICATION: Shifting the start time of the two weekly 48 hour commercial salmon periods in the Unalakleet and Shaktoolik Subdistricts will allow the processor to more efficiently transport fish out of Unalakleet to market. The shift in periods reduces the risk of salmon not making it to market by having periods end to coincide better with scheduled air fright flights.
In the Unalakleet Subdistrict there were 3,348 silvers and 920 chums caught by 17 permit holders during the period ending August 4th. Catches of both silvers and chums are above average. To date there have been 6,600 silvers and 3,500 chums harvested in Unalakleet. In the Shaktoolik Subdistrict there were 1,311 silvers and 611 chums caught

by 6 permit holders. Catches of both silvers and chums are above average. To date there have been 2,200 silvers and 900 chums harvested in Shaktoolik.
The department test net at Unalakleet River has caught 110 coho through August 4. The catch is the second highest cumulative catch in 20 year history of the test net. The Unalakleet IRA tower has counted 3,060 coho through August 4 and this is the second highest count for this date in the 9-year history of the project.
One buyer is registered for salmon buying in Norton Sound and will buy in both the Unalakleet and Shaktoolik Subdistricts. If catches are average or better and the test fish catch and tower escapement counts continue to indicate a good run the department plans to stay with the two 48-hour commercial fishing periods per week schedule unless the buyer requests a change. Allowing the normal commercial fishing schedule in the Unalakleet and Shaktoolik Subdistricts should not jeopardize subsistence fishing or coho salmon escapement needs.

Emergency Order: 3-S-Z-24-04 Effective Date: August 9, 2004
EXPLANATION: This emergency order returns the upstream subsistence fishing boundary of the Nome River to the normal location at Osborn Creek. Also, this emergency order closes Anvil Creek, a tributary of Snake River to subsistence salmon fishing.
JUSTIFICATION: Coho salmon have begun to move past the Nome River and to date the escapement is the second highest on record since project counts began in 1993. The upper boundary of the subsistence area had been moved to below the weir site to protect spawning chum salmon as this was the first year that chum salmon have reached the escapement goal range of 2,900 to 4,300 fish. The chum salmon run is now nearly complete and most chum salmon have spawned. Harvesting some chum salmon will not jeopardize the escapement and returning the boundary to Osborn Creek will allow subsistence fishers to harvest coho salmon moving upstream. At Anvil Creek the last several years few coho salmon have survived to spawn. Easy road access to Anvil Creek has allowed a much greater fishing effort on this stream and there have been violations of the catch limit. To protect the spawning coho salmon the department will close Anvil Creek to salmon fishing this year.

Emergency Order: 3-S-Z-25-04 Effective Date: August 26, 2004
EXPLANATION: This emergency order closes the Fish and Niukluk River to the regular subsistence salmon fishing schedule and establishes two 24-hour periods per week for subsistence fishing.
JUSTIFICATION: The coho salmon passage at the Niukluk River tower has been poor this season. In the 10 year history of the project this year's coho passage at the tower will likely rank as the second worst. High water events prevented counting at the tower twice this season. One and one-half days of counting were missed on August 8 and 9, but few cohos are thought to have passed during this time period as the two preceding days the count was 15 cohos and the two following days the count was 30 cohos. The second high water event occurred from August 13 until August 17 and no estimate of coho passage was made for this time period. Cohos move upstream with the higher water flows and there likely were a number of cohos that moved past the tower between 13th and 17th. After the second high water event the counts on the 17th and 18th were poor, but the daily counts on August 19 - 21 were over 100 cohos each day with counts peaking on August 20 with 165 cohos past the tower. Escapement counts the last three days have been under 100 cohos per day. At this time the total count past the Niukluk River is 1,100 cohos which is the same number as has been counted past the Nome River weir, even though the Nome weir was not operational for 10 days in August because of the high water. This is the first time the Nome River has had as many cohos counted in the escapement as the Niukluk River. The escapement goal for the Niukluk River is a 950 to 1,900 coho salmon by aerial survey. Smoke conditions have prevented aerial surveys, however a survey by boat of the Niukluk River showed a low number of cohos. Because of low numbers of cohos, the Fish and Niukluk River drainages were closed to the sport fish harvest of coho salmon. Likewise, subsistence fishing will be restricted to prevent the overharvest of coho salmon and allow for escapement. Subsistence fishing is being restricted to two 24-hour periods per week from 6 p.m. Monday until 6 p.m. Tuesday and from 6 p.m. Thursday until 6 p.m. Friday. Subsistence fishers can use rod and reel, but no bait can be used and the limit is 3 cohos per day when rod and reel fishing. All subsistence fishers must be in possession of a permit.
As soon as conditions allow the department will conduct aerial surveys. If coho escapement is likely to be met the department will eliminate the subsistence fishing restrictions. However, if surveys show coho escapement will not reach the escapement goal then subsistence fishing will be closed.

Emergency Order: 3-S-Z-26-04 Effective Date: September 5, 2004

EXPLANATION: This emergency order changes the starting time of the last 48-hour commercial salmon fishing periods in the Unalakleet and Shaktoolik Subdistricts. Beginning 6 p.m. Sunday, September 5 commercial salmon fishing will be open from 6 p.m. Sunday until 6 p.m. Tuesday. Commercial fishing will close for the season on September 7th by regulation. Only nets with a mesh size no larger than 6 inches will be allowed.

JUSTIFICATION: Shifting the start time of last 48 hour commercial salmon period of the season in the Unalakleet and Shaktoolik Subdistricts will allow fishers to continue the schedule that they have followed since August 8th. The major processor has ceased operations due to blushed fish and poor fish quality. One Anchorage processor has made a fisherman a licensed agent and has indicated that they would like to purchase fish during the final period.

In the Unalakleet Subdistrict there were 1,775 silvers caught by 11 permit holders during the period ending September 3rd. To date there have been 29,320 silvers and 4,924 chums harvested in Unalakleet. In the Shaktoolik Subdistrict there were 265 silvers caught by 5 permit holders. To date there have been 12,728 silvers and 1,372 chums harvested in Shaktoolik.

The department test net at Unalakleet River has caught 542 coho through September 2nd. The Unalakleet IRA tower has counted 8,300 coho through September 2 and this is the second highest count for this date in the 9-year history of the project. Allowing one more commercial fishing period in the Unalakleet and Shaktoolik Subdistricts should not jeopardize subsistence fishing or coho salmon escapement needs.